

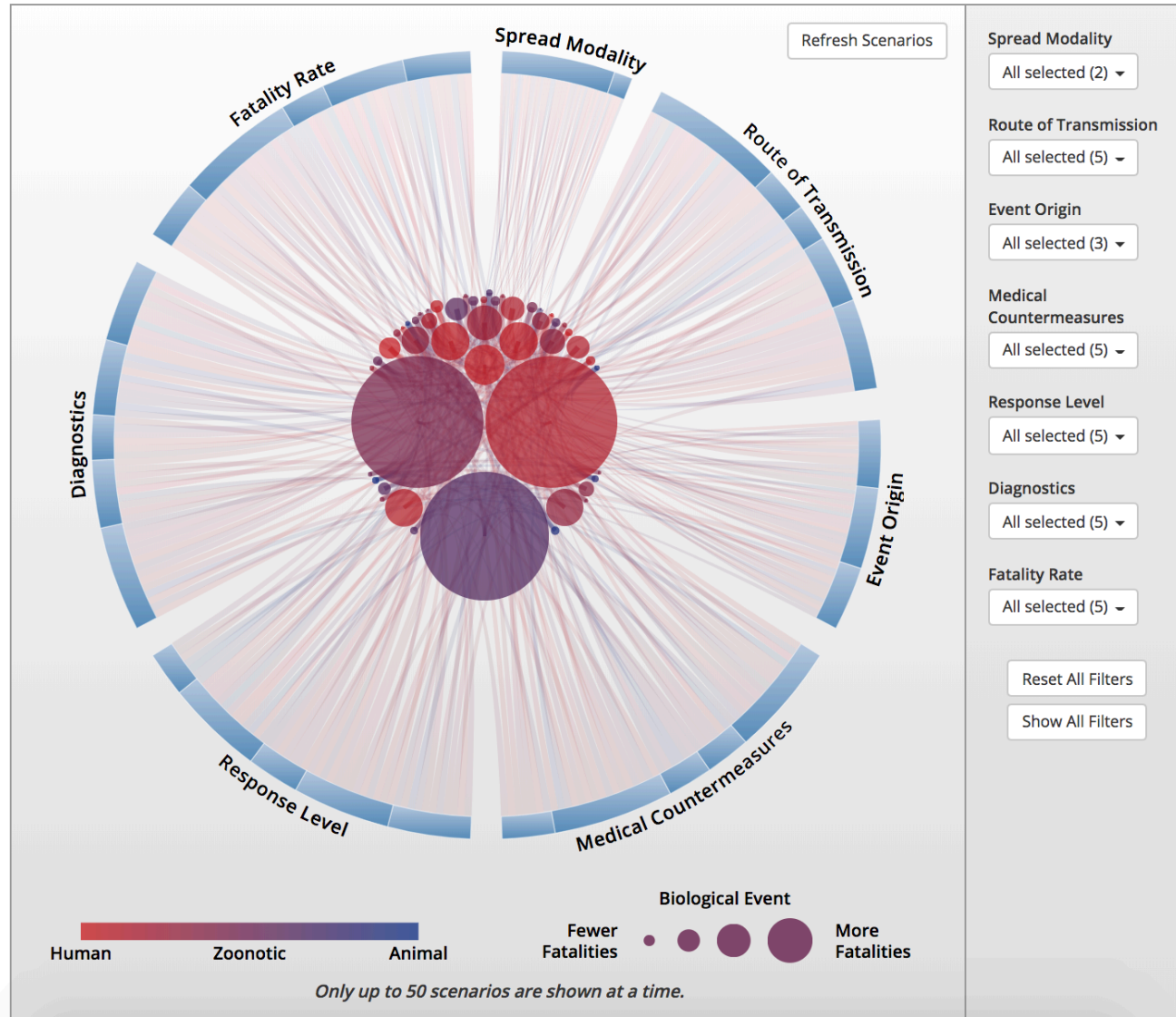
Biosecurity, Governance, International Diplomacy and the Risk of Infectious Disease Outbreaks in the Caribbean

Rebecca Katz, PhD MPH
August 2018



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Understanding biological threats



12 parameters
22 million rationalized
scenarios

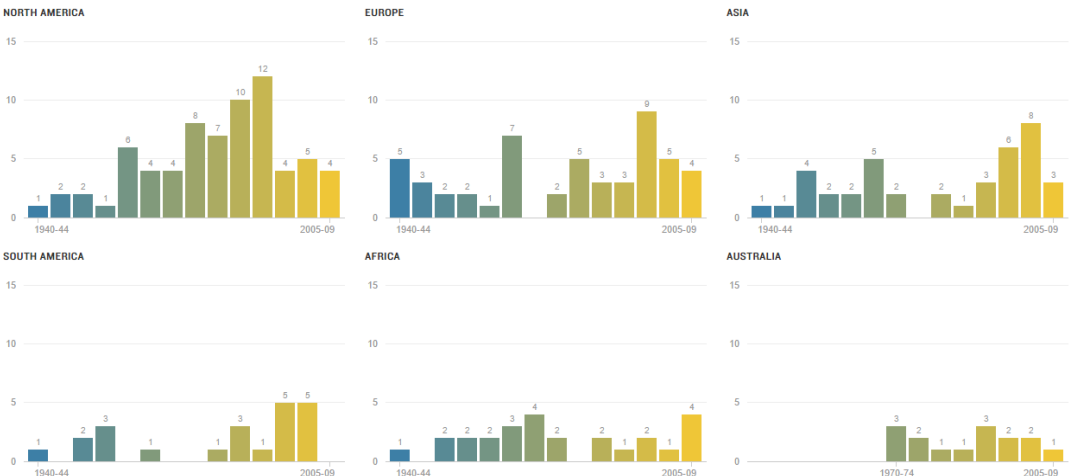
<https://bioscenarios.talusanalytics.com>

The Lancet Global Health Katz, R., E. Graeden, J. Kerr. (2018) The complexity of biological events. *The Lancet Global Health*. **6-2**: 136-137.



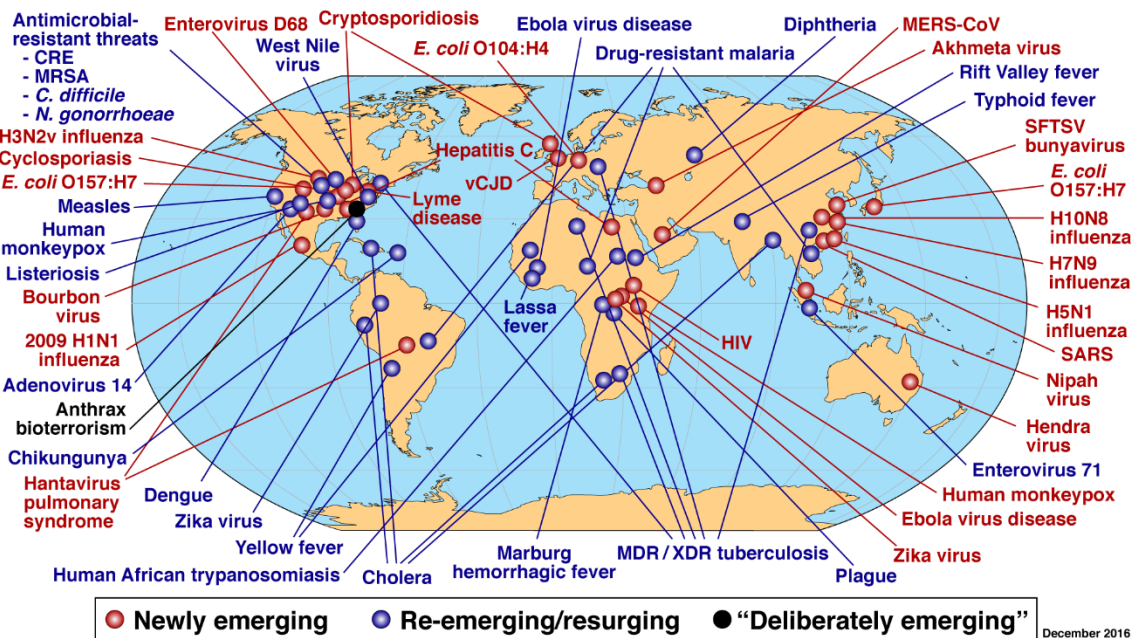
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The large number of emerging diseases in North America and Europe is due, in part, to the capability of richer countries to detect more infectious diseases



Credit: Michaela Doucett, Eunice Esomuy, Brittany Mayes and Katie Park/NPR

Global Examples of Emerging and Re-Emerging Infectious Diseases



Fauci, 2017

Media Advisory Wednesday, April 4, 2018

New coronavirus emerges from bats in China, devastates young swine

Identified in same region, from same bats, as SARS coronavirus.



What

A newly identified coronavirus that killed nearly 25,000 piglets with severe acute respiratory syndrome coronavirus (SARS-CoV), with swine acute diarrhea syndrome coronavirus (SADS-CoV). It does not affect humans. The virus was found in four pig farms in China's Guangdong Province. The work was a collaboration between the Chinese Academy of Medical Sciences, Wuhan Institute of Virology and other organizations, including the National Institutes of Health.

The researchers say the finding is an important reminder that potential to infect people is a key way to reduce global health t

viral mystery



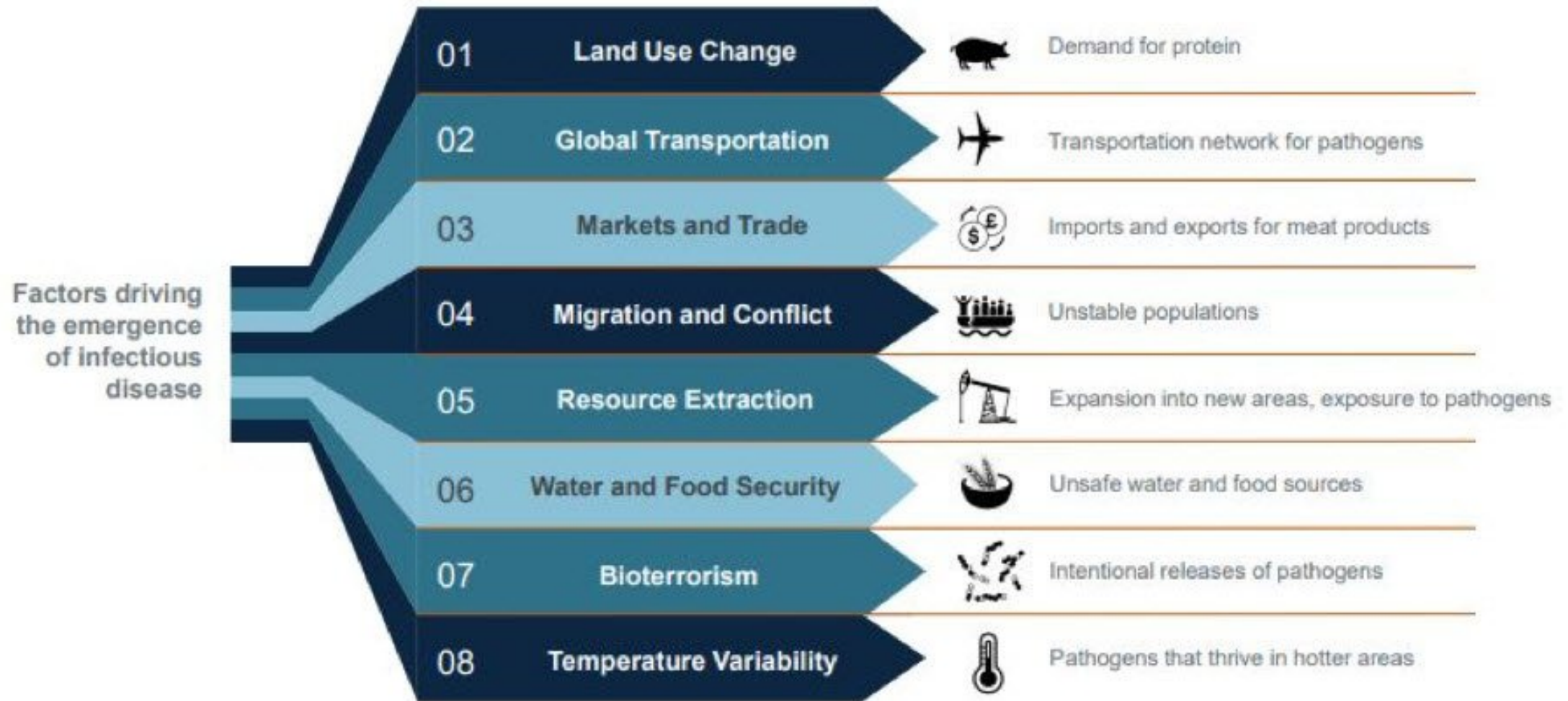
Why Researchers Were Swabbing Bat Butts

Some 24,000 piglets in China have died from a virus that no one had ever seen before. What caused it? And is there a risk for crossover to humans?



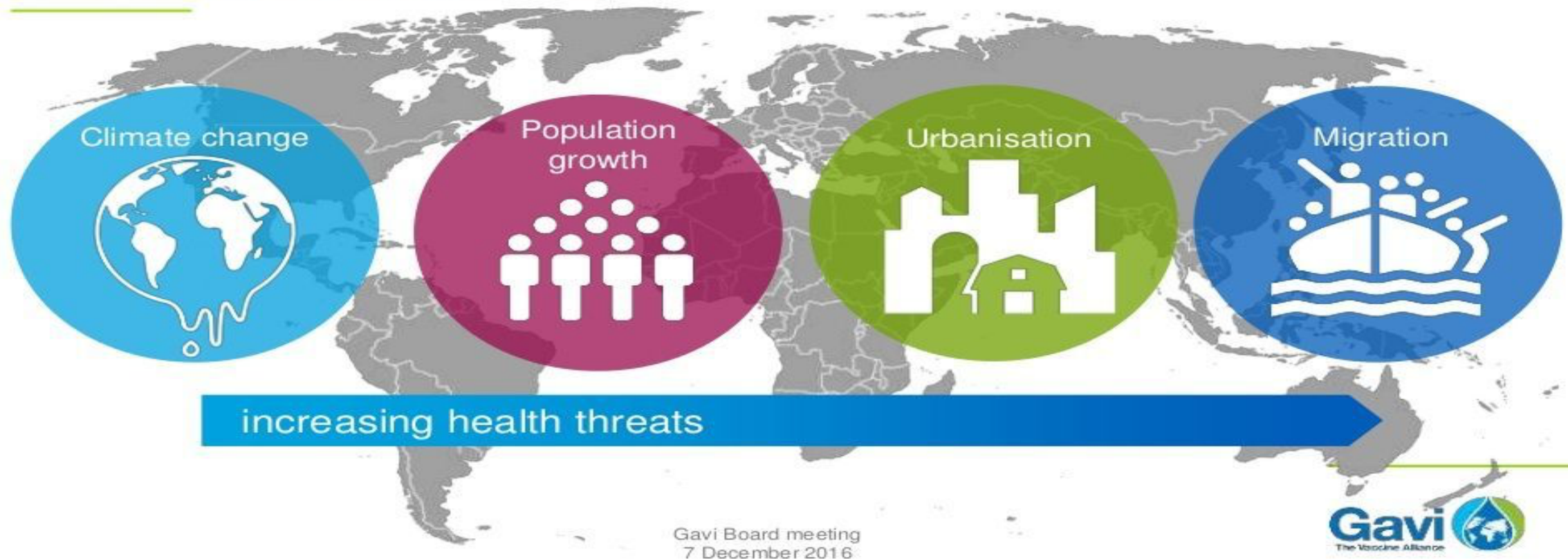
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Factors of Emergence for Infectious Diseases

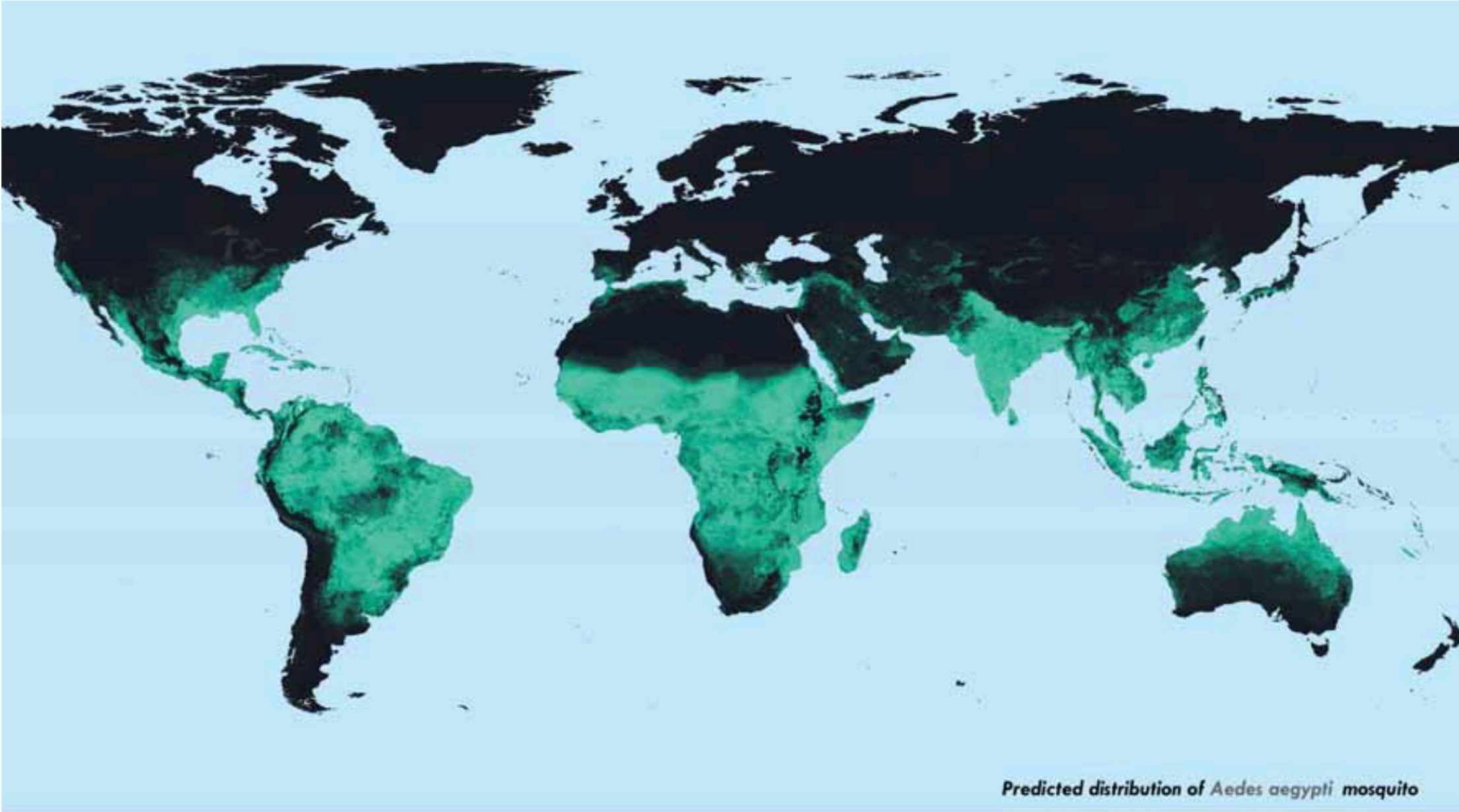


Source: Metabiota. <http://www.brinknews.com/using-modern-data-and-analytics-to-confront-the-challenge-of-epidemic-risk/>

Growing risk factors



Predicted distribution of the *Aedes Aegypti* mosquito



Map redrawn using service layers from <http://eprints.who.int/content/4/e08347/11>, Kraemer MUG et al. eLife (Published June 30, 2015)

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its boundaries, or concerning the responsibility of its frontiers or boundaries. Dashed lines indicate areas of potential boundary dispute for which the WHO has no official position.



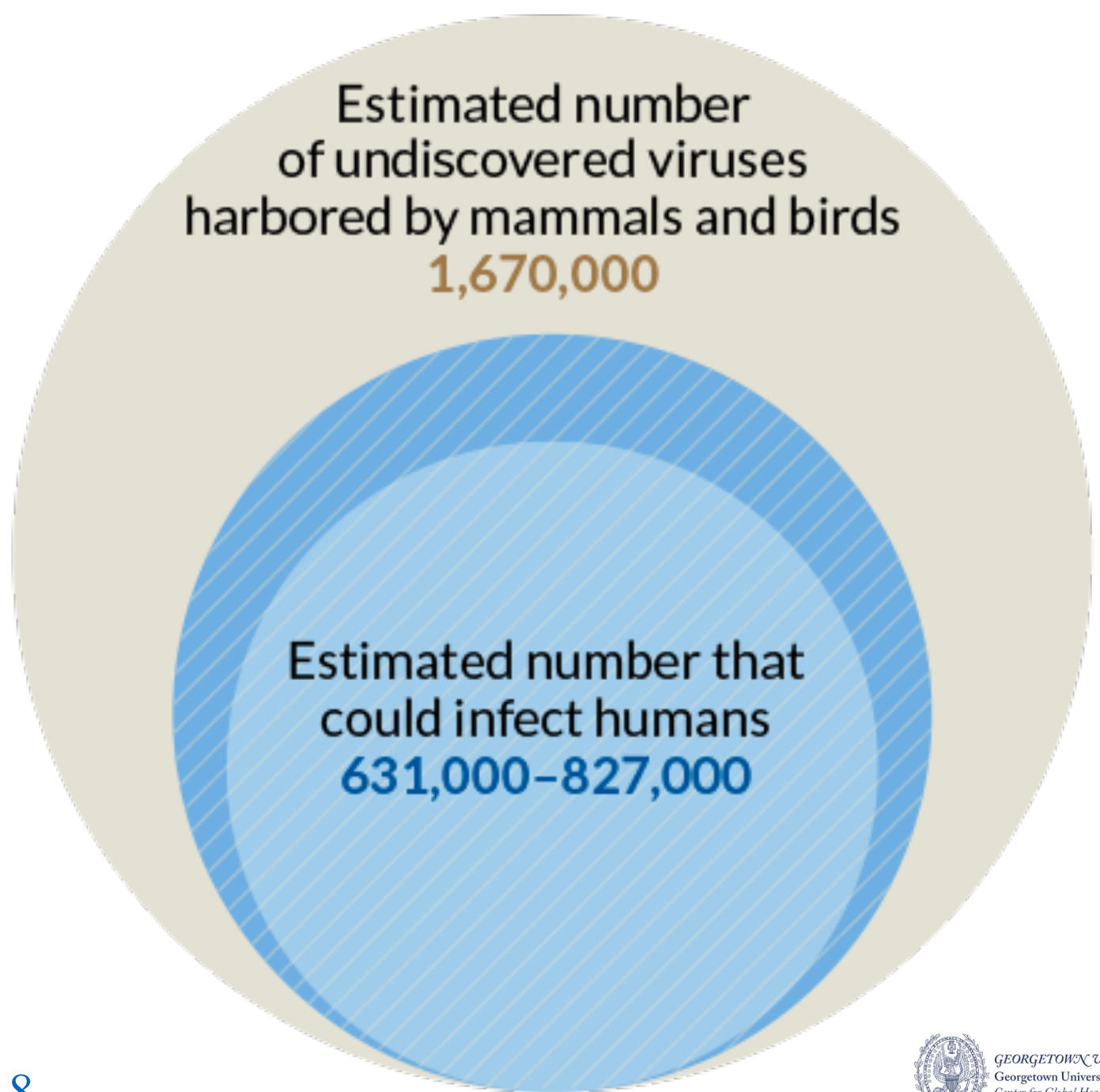
ONE HEALTH



The One Health concept recognizes the interrelationship between animal, human and environmental health.



•
Viruses known
to infect humans
263



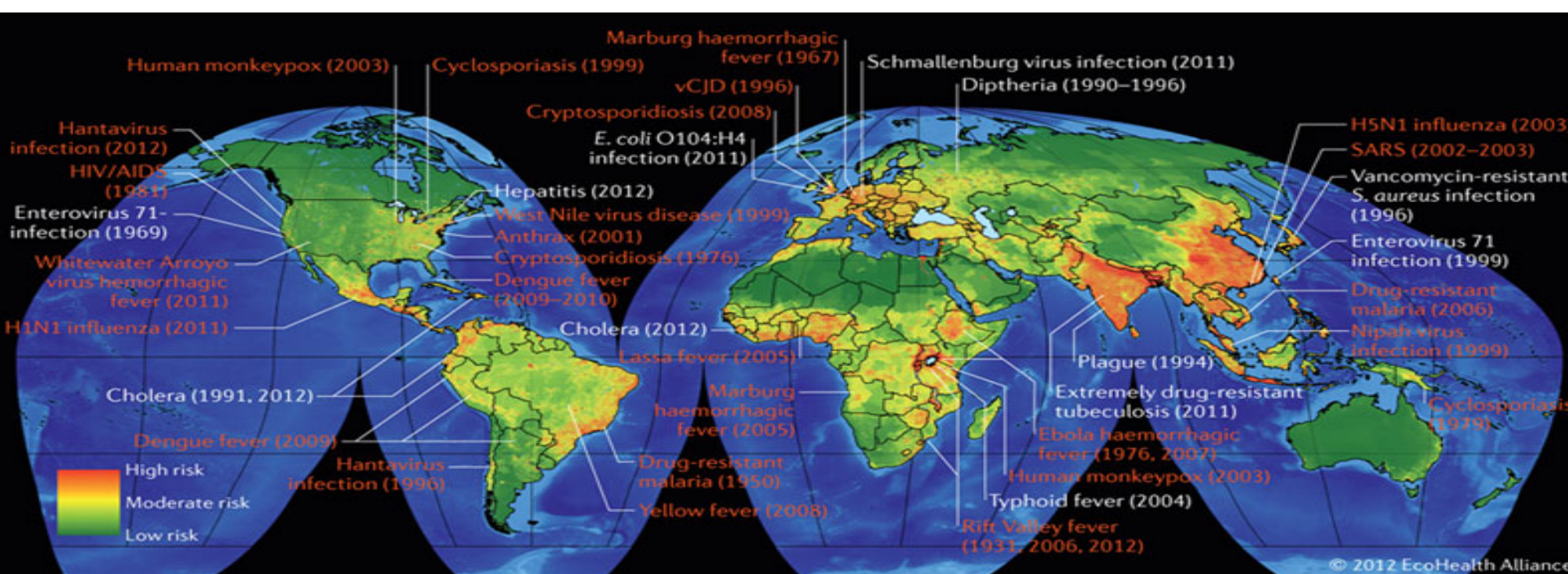
Source: [D. Carroll et al/ Science 2018](#)

Hypothetical epidemic, spread by worldwide air transportation networks



D. Brockmann, D. Helbing_Science 342, 1337 (2013)

A health
threat
anywhere
is a health
threat
everywhere



*Nature Reviews
Microbiology
2013;11: 133-141.*

*The Lancet
380:9857, 1-7 Dec
2012, pp. 1946-
55.*



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WHO Disease Alerts:

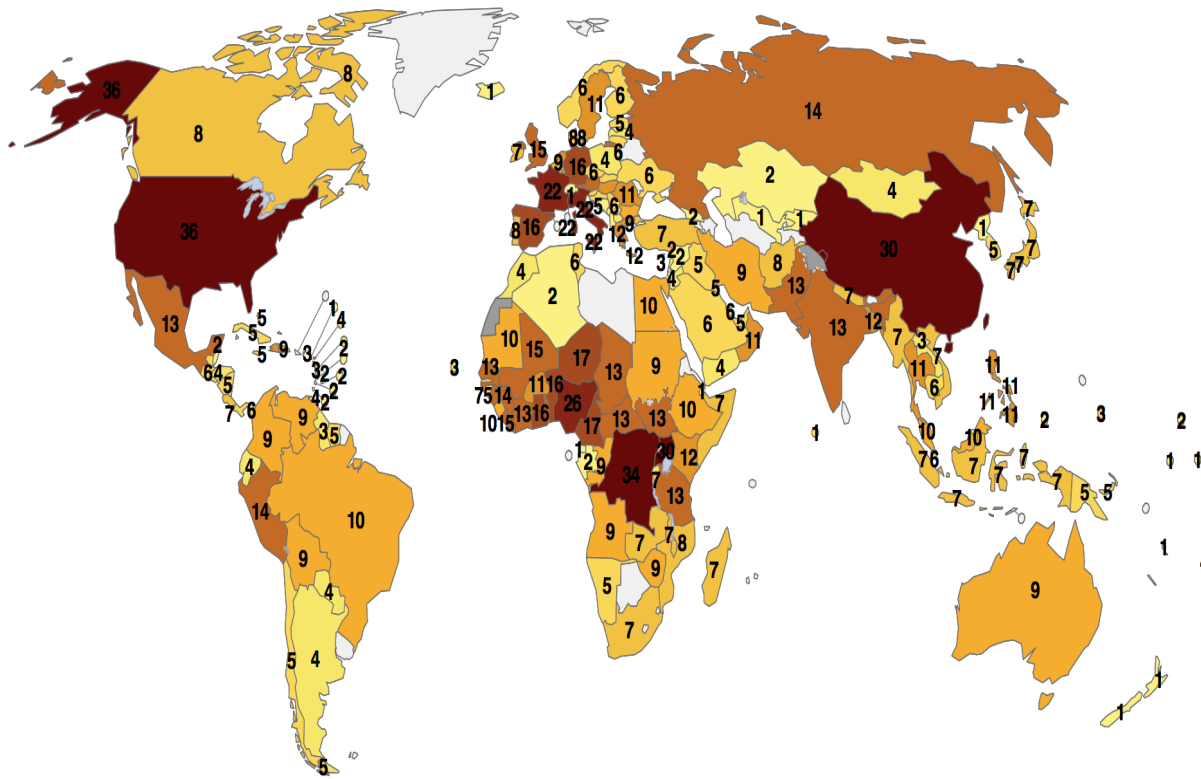
Screen approximately 3000 signals a month; Follow up on 300 events per month/ Investigate 30 events per month



World Health Organization

Burden of epidemics: illustrations

Epidemic events* globally, 2011 – 2017**: A total of 1,307 epidemic events, in 172 countries



* Analysis excluded Poliomyelitis. The following epidemic and pandemic diseases were analysed: Avian Influenza A(H5N1), A(H7N9), A(H7N6), A(H10N8), A(H3N2), A(H5N6), A(H9N2), Chikungunya, Cholera, Crimean-Congo haemorrhagic fever, Ebola virus disease, Lassa fever, Marburg virus disease, Meningitis, MERS-CoV, Monkeypox, Nodding syndrome, Nipah virus infection, Plague, Rift Valley fever, Shigellosis, Typhoid fever, Viral haemorrhagic fever, West Nile fever, Yellow fever, Zika virus disease. If a disease caused more than 1 epidemic event by year in a country, it was only counted once for the year it occurred in that country. Includes cases imported or locally transmitted.

** WHO/IHM data as of 12 January 2018 (note: 2017 data is not complete)

Source: data reported to WHO and in media

Epidemic events* globally, 2011 – 2017**: A total of 1,307 epidemic events
Number of epidemic events* by disease and year

								TOTAL
Yellow fever	17	12	8	2	4	10	4	57
Chikungunya	8	10	3	29	27	14	4	95
Viral haemorrhagic fever						6	4	10
Ebola virus disease	1	2		11	4	3	1	22
Marburg virus disease		1		1			2	4
Crimean-Congo haemorrhagic fever	3	5	6	8	7	7	13	49
Rift Valley fever	1	1	1	1	1	4	5	14
Cholera	62	51	47	37	44	42	25	308
Typhoid fever	20	23	5	2	8	3	14	75
Shigellosis	25	24	28	29	4	2	1	113
Plague	8	7	6	10	7	6	3	47
Lassa fever	2	1	2	3	2	7	6	23
West Nile fever	11	15	15	11	11	18	10	91
Zika virus disease			5	7	19	54	52	137
Meningitis	14	20	19	19	19	23	23	137
MERS-CoV		3	10	17	12	7	8	57
Influenza A	5	6	7	9	10	5	9	51
Monkeypox					2	2	5	10
Nodding syndrome		1	1					2
Nipah virus infection	1	1	1	1	1			5
	2011	2012	2013	2014	2015	2016	2017**	

* Analysis excluded Poliomyelitis. The following epidemic and pandemic diseases were analysed: Avian Influenza A(H5N1), A(H7N9), A(H7N6), A(H10N8), A(H3N2), A(H5N6), A(H9N2), Chikungunya, Cholera, Crimean-Congo haemorrhagic fever, Ebola virus disease, Lassa fever, Marburg virus disease, Meningitis, MERS-CoV, Monkeypox, Nodding syndrome, Nipah virus infection, Plague, Rift Valley fever, Shigellosis, Typhoid fever, Viral haemorrhagic fever, West Nile fever, Yellow fever, Zika virus disease. If a disease caused more than 1 epidemic event by year in a country, it was only counted once for the year it occurred in that country. Includes cases imported or locally transmitted.

** WHO/IHM data as of 12 January 2018 (note: 2017 data is not complete)

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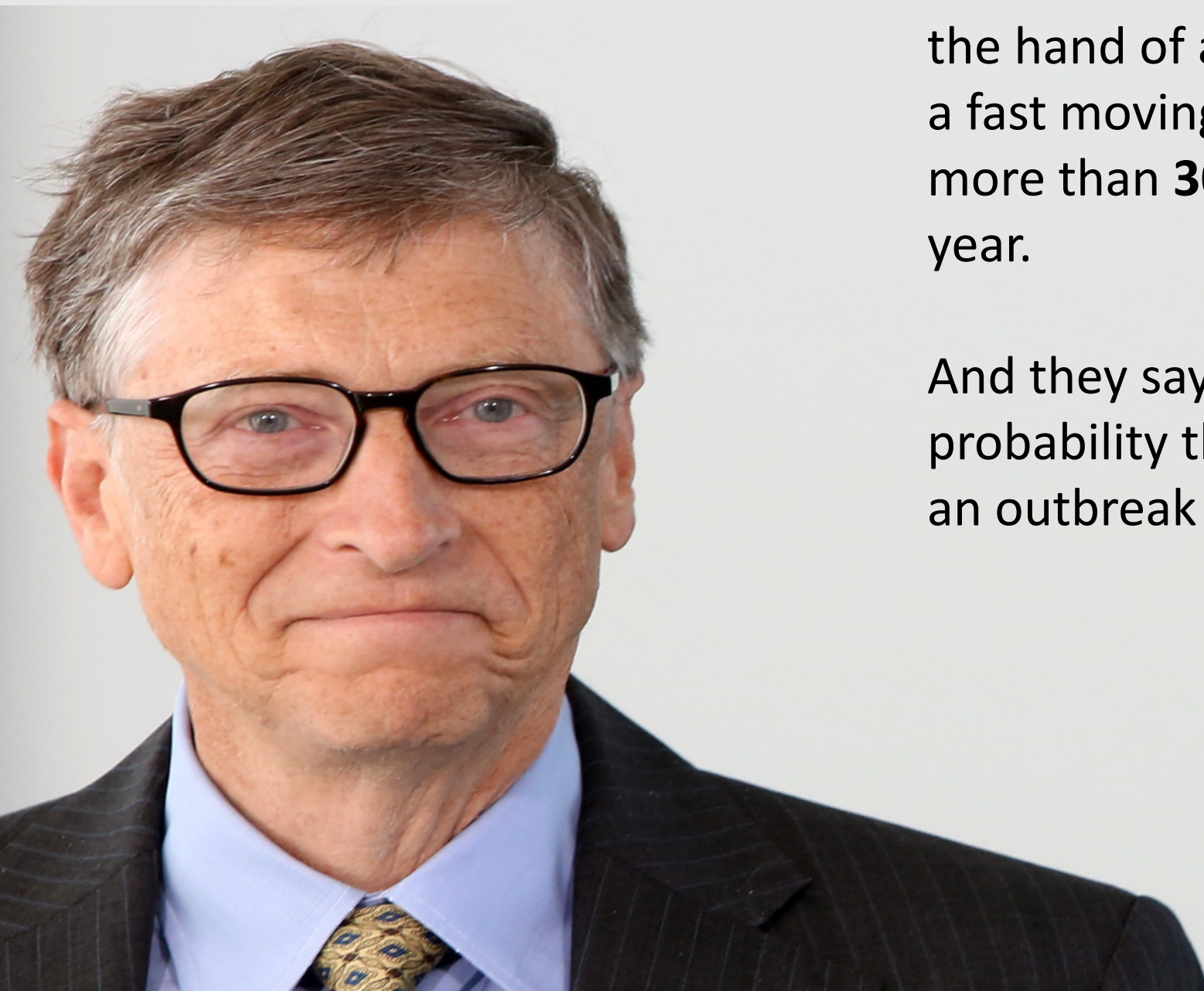
World Health
Organization

WHO Top 8 Priorities for Research and Development

- Crimean-Congo hemorrhagic fever (CCHF)
- Ebola virus disease and Marburg virus disease
- Lassa fever
- MERS-CoV and SARS
- Nipah and henipaviral diseases
- Rift Valley Fever (RVF)
- Zika
- Disease X



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“Whether it occurs by a quirk of **nature** or at the hand of a **terrorist**, epidemiologists say a fast moving airborne pathogen could kill more than **30 million people** in less than a year.

And they say there is a reasonable probability the world will experience such an outbreak in the next **10-15 years.**”

Bill Gates
Munich Security Conference
February 2017



Original Contributions

A Large Community Outbreak of Salmonellosis Caused by Intentional Contamination of Restaurant Salad Bars

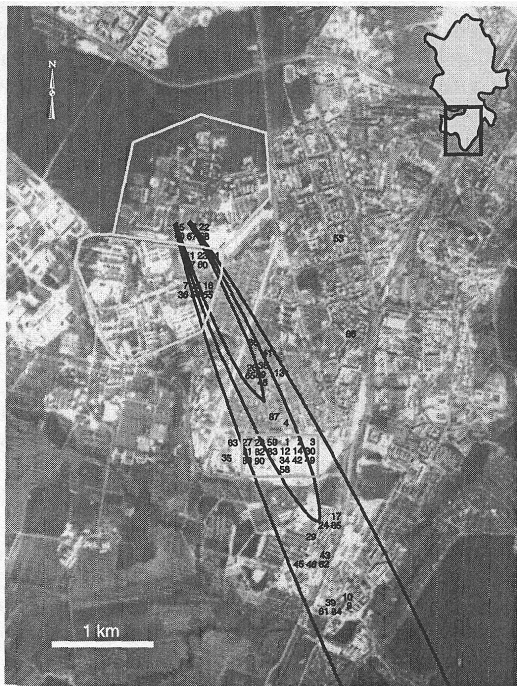
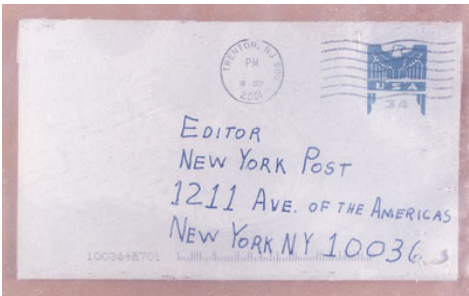
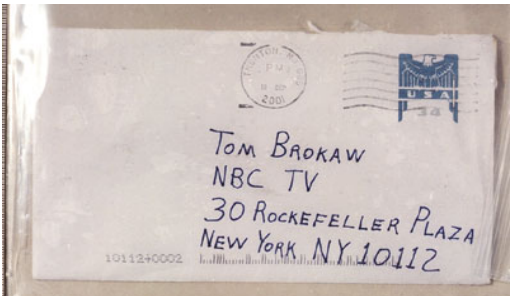
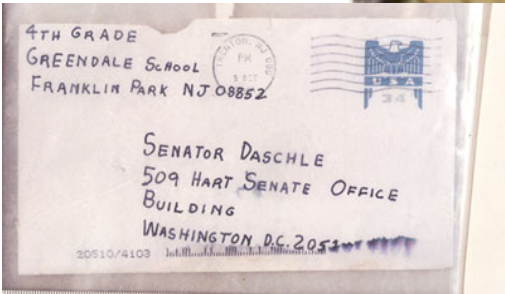
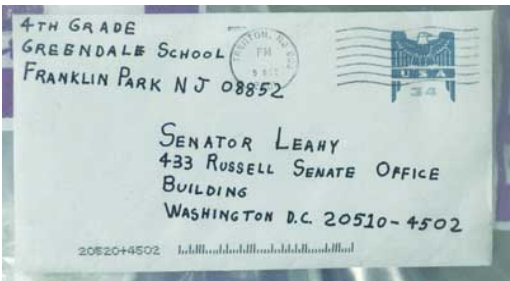
Thomas L. Tenover, MD; Robert V. Tauxe, MD, MPH; Robert F. Wise, MD, MPH; John P. L. Vongpikul, MD; Robert Sokolow; Steven Mancus; K. John A. McKenna; Michael P. Skeen; PhD, MPH; John M. Horan, MD, MPH; Laurence R. Foster, MD, MPH

Context.—The large outbreak of foodborne disease highlights the challenge of investigating outbreaks caused by intentional contamination and demonstrates the vulnerability of self-service foods to intentional contamination.

Objective.—To investigate a large community outbreak of *Salmonella* Typhimurium infections.

Design.—Epidemiologic investigation of patients with *Salmonella* gastroenteritis and possible exposures in The Dalles, Oregon. Cohort and case-control investigations were conducted among groups of restaurant patrons and employees to identify exposures associated with illness.

On September 17, 1984, the Waco-

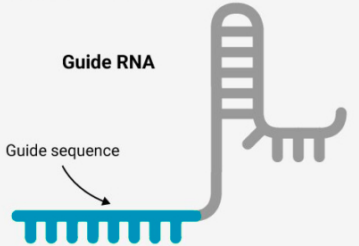


Advances in Science and Technology



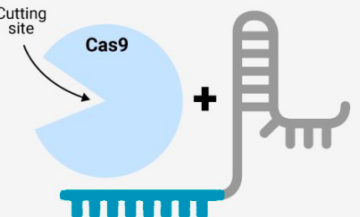
EDITING A GENE USING THE CRISPR/CAS9 TECHNIQUE

1 Scientists create a genetic sequence, called a "guide RNA," that matches the piece of DNA they want to modify.



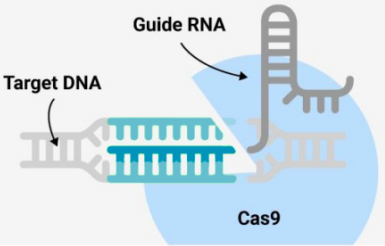
Guide RNA
Guide sequence

2 This sequence is added to a cell along with a protein called Cas9, which acts like a pair of scissors that cut DNA.



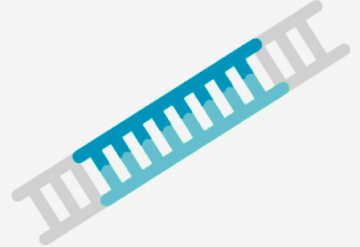
Cas9
Cutting site

3 The guide RNA homes in on the target DNA sequence, and Cas9 cuts it out. Once their job is complete, the guide RNA and Cas9 leave the scene.



Guide RNA
Target DNA
Cas9

4 Now, another piece of DNA is swapped into the place of the old DNA, and enzymes repair the cuts. Voilà, you've edited the DNA!



SOURCES: Nature News; Carl Zimmer

BUSINESS INSIDER

NEWS IN FOCUS

GENE THERAPY Britain maps route to genetic modification of eggs? **A18**
US ELECTIONS Presidential candidates abandon earlier views on science? **A21**
ARCHAEOLOGY Robots boost the hunt for Bronze Age shipwrecks? **A28**
TECHNOLOGY Is it time to turn the page on the lab notebook? **A38**



Countries with endemic H5N1 avian flu, such as India, often have limited resources to control the virus.

BIOSECURITY

Caution urged for mutant flu work

Public-health benefits of controversial research questioned.

BY DECLAN BUTLER

Why would scientists deliberately create a form of the H5N1 avian influenza virus that is probably highly transmissible in humans? In the growing debate about research that has done precisely that, a key question is whether the public-health benefits of the work outweigh the risks of a potential pandemic if the virus escaped from the lab.

For the scientists who have created the mutated strains of the H5N1 virus, the justifications are clear. Surveillance of flu viruses could, they argue, allow health organizations to monitor birds and other animals for the mutations that would provide an early warning of a pandemic and enable authorities to act quickly to contain the virus.

That claim is meeting with scepticism, however. More than a dozen flu experts contacted by Nature say they believe that the work opens up important vistas in basic research, and that it sends a valuable warning about the potential for the virus to spark a human pandemic. But they caution that virus surveillance systems are ill-equipped to detect such mutations arising in flu viruses. As such, work on the viruses is unlikely to offer significant, immediate public-health benefits, they say.

That tips the balance of risk-benefit assessment in favour of a cautious approach, says Michael Osterholm, who heads the University of Minnesota's Center for Infectious Disease Research and Policy in Minneapolis, and who is a member of the US National Science Advisory Board for Biosecurity (NSABB).

In a paper submitted to Science, Ron Fouchier's team at Erasmus Medical Center in Rotterdam, the Netherlands, found that just five mutations allowed avian H5N1 to spread easily among ferrets, which are a good proxy for how flu behaves in other mammals, including humans. All five mutations have been spotted individually – although not together – in wild viruses. Yoshihiro Kawaoka of the University of Wisconsin-Madison and his colleagues have submitted similar work to Nature, which is partially described in an online Comment published this week.

Acting on advice from the NSABB, the US government last month asked Science and Nature to publish only the broad conclusions of the two studies, and not to reveal the scientific details, in order to limit the risk that uncontrolled proliferation of such research might lead to accidental or intentional release of similar mutant viruses. The journals and the authors have agreed to this reduction, provided that a mechanism is established to disseminate the data to flu researchers and public-health officials on a need-to-know basis. The US government, the World Health Organization (WHO) and other bodies are now trying to put this mechanism together, along with a framework for international oversight of such research.

Last week, in a statement jointly published in Nature and Science, 39 flu researchers declared a 60-day pause in the creation of lab mutant strains of the H5N1 avian flu virus. The hiatus, they hope, should give scientists and policymakers time to debate how such research might best proceed, and what safety measures should be required of labs that handle the virus. The signatories to the statement, including the key authors behind the controversial research, plan to bring

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26 JANUARY 2012 | VOL 481 | NATURE | 417

Science Needs for Microbial Forensics



DEVELOPING INITIAL INTERNATIONAL RESEARCH PRIORITIES

NATIONAL RESEARCH COUNCIL OF THE NATIONAL ACADEMIES

IN COOPERATION WITH

THE CROATIAN ACADEMY OF SCIENCES AND ARTS

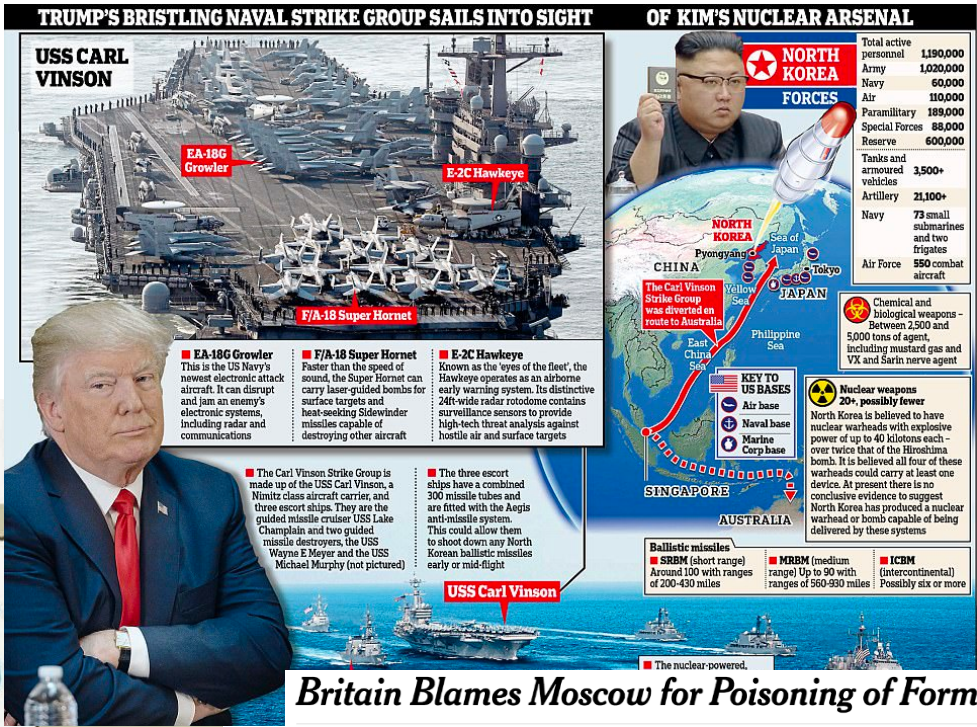
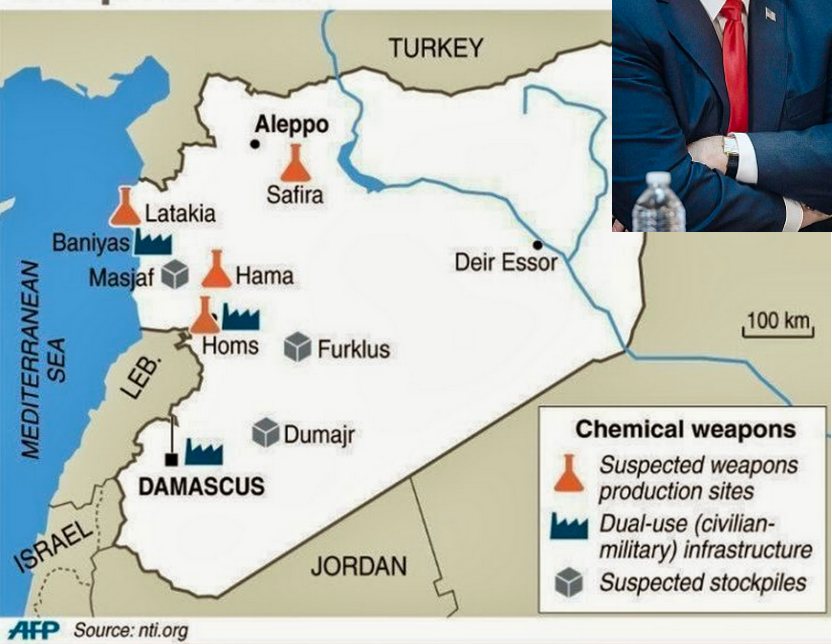
THE U.K. ROYAL SOCIETY AND

THE INTERNATIONAL UNION OF MICROBIOLOGICAL SOCIETIES



Geopolitics

Syria: alleged chemical weapons sites



Britain Blames Moscow for Poisoning of Former Russian Spy

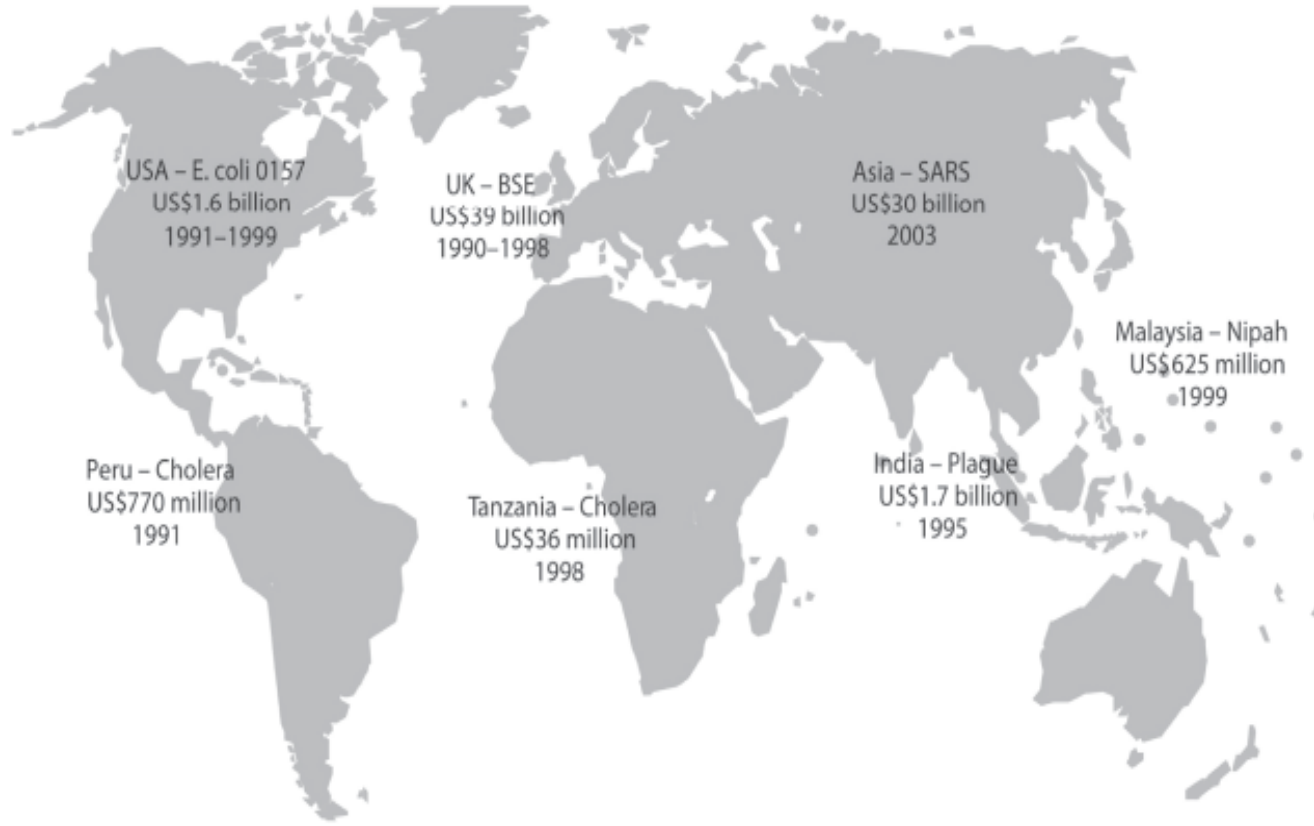
By ELLEN BARRY and RICHARD PÉREZ-PEÑA MARCH 12, 2018



RELATED COVERAGE

- After Russian Spy Poisoning, Britain Tells Public to Wash Clothes and Use Baby Wipes MARCH 11, 2018
- British Investigators Visit Graves of Russian Ex-Spy's Wife and Son MARCH 9, 2018
- In Poisoning of Sergei Skripal, Russian Ex-Spy, U.K. Sees Cold War Echoes MARCH 6, 2018
- Former Russian Spy Mysteriously Falls Ill in Britain. Again. MARCH 5, 2018

Economic impact of selected infectious disease outbreaks



^a Excludes economic impact of human sickness and death.

Pandemics | The cost of a global outbreak

H1N1 flu (1918)

- 50-100 million deaths
- GDP losses of 3 per cent in Australia, 15 per cent in Canada, 17 per cent in the UK and 11 per cent in the USA

SARS (2003)

- 774 deaths
- Loss to the global economy of \$52.2 billion

Ebola (2014)

- More than 11,000 deaths
- GDP losses of \$2.8 billion in Guinea, Liberia, and Sierra Leone
- Loss to the global economy of \$3.5 billion

Zika (2015–16)

- 20 deaths
- More than 3,000 babies estimated to be born with birth defects
- Estimated economic loss of \$3.5 billion in Latin American and the Caribbean region

Heymann DL. Emerging and re-emerging infections. In *Oxford Textbook of Public Health*, 5th ed, 2009, p1267.

Pandemics are a serious threat to global health and economic security

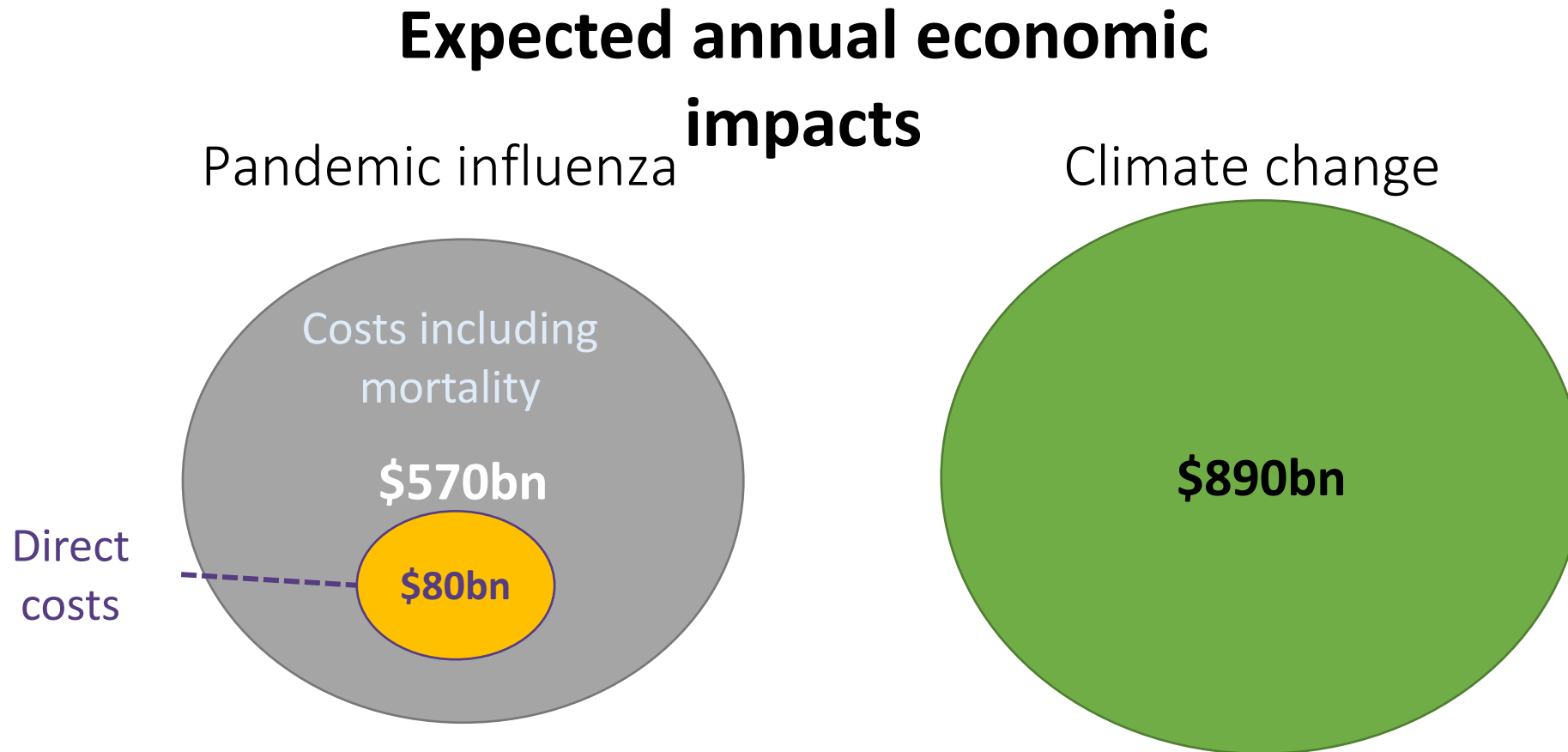
Estimated annual global cost
of a moderate to severe pandemic =
\$570 billion, or 0.7% of global income

Estimated cost of a severe pandemic
like the 1918 Spanish Flu =

Up to 5 percent of global income

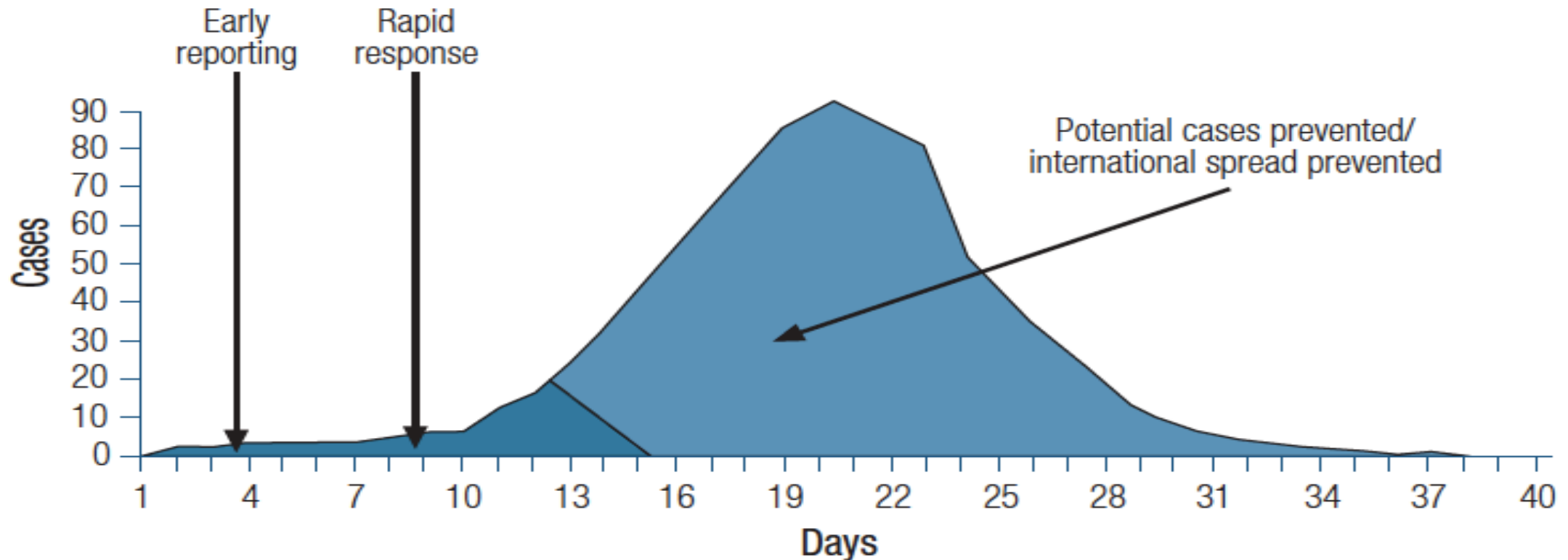


Significant economic burden



So is the world prepared for the
next biological threat?

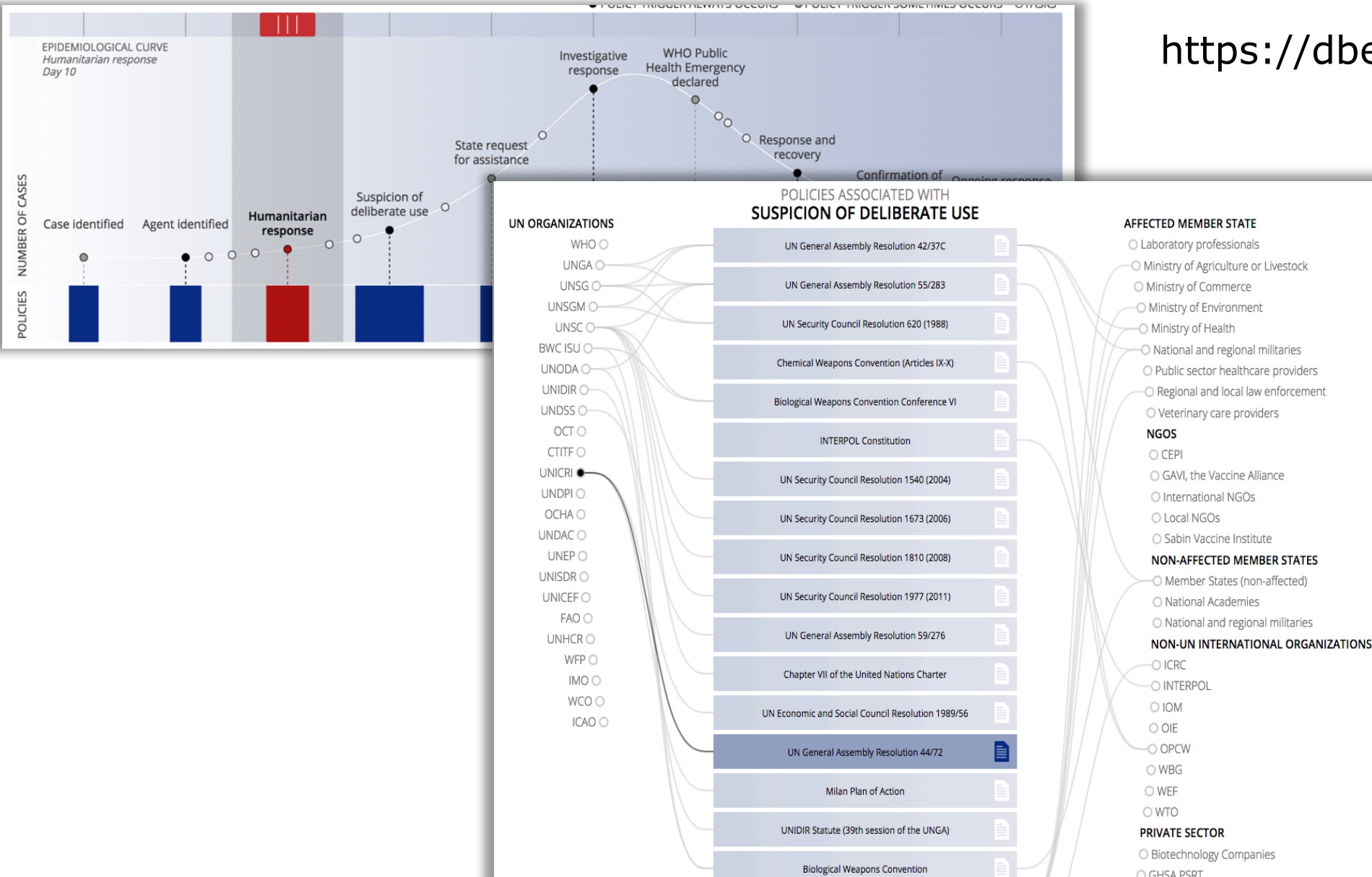
Early Detection Of Outbreaks Saves Lives



Preparedness	Detection	Reporting	Response	Recovery	Investigation	Governance
<i>For animal, human and plant; all biological agents</i> <i>Requiring experts in the following fields: field epidemiology, laboratory diagnostics and analyses, risk communication, emergency management, intelligence, delivery and dissemination methods, clinical medicine, sampling, logistics, operations and leadership, command and control, microbial forensics, investigative evidence gathering, interviewing, data mining, anthropology, media relations, report writing, diplomacy</i>						
IHR- JEE Core Capacity Indicators for Prevention and Detection OIE Terrestrial Code- PVS Pathways Threat analysis	Early Warning Indicator Surveillance Event Based Surveillance Threat analysis	Event notification Risk and crises communication	Event verification Border security Ongoing surveillance Threat Analysis Needs Assessment Mobilization of financial resources Containment and Mitigation - Procurement and Distribution of PPE and MCM - Clinical treatment - Humanitarian relief and assistance	Decontamination Humanitarian assistance Security	Law enforcement mechanisms International investigation Evidence for attribution determination	Diplomacy Coordination Travel and Trade Security

Mapping response to a deliberate biological event

<https://dbe.talusanalytics.com/>



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BEFORE EPIDEMIC

Prepare for the inevitable



Source: WHO

Year	Treaty	Focus
1892	International Sanitary Convention	Cholera
1893	International Sanitary Convention	Cholera
1894	International Sanitary Convention	Cholera
1897	International Sanitary Convention	Plague
1903	International Sanitary Convention (replaces previous 4 versions)	Cholera and plague
1905	Inter-American Sanitary Convention	Governance
1912	International Sanitary Convention (replaces 1903 version)	Cholera, plague and Yellow Fever
1924	Pan American Sanitary Code	Governance and plague, cholera, yellow fever, smallpox, typhus, epidemic cerebrospinal meningitis, acute epidemic poliomyelitis, epidemic lethargic encephalitis, influenza or epidemic la grippe, typhoid and paratyphoid fevers
1926	International Sanitary Convention (modifying 1912 version)	Plague, cholera, yellow fever, smallpox, typhus
1927	Protocol to the Pan American Sanitary Convention	Ratification
1938	International Sanitary Convention (amending 1926 version)	Plague, cholera, yellow fever, typhus or smallpox; governance for Egypt, Suez Canal and the Hajj
1944	International Sanitary Convention (modifying 1926 version)	Plague, cholera, yellow fever, typhus, and smallpox, as well as “outbreaks of such other communicable disease as....constitute a menace to other countries...”; change of governance UNRRA
1946	Protocols to Prolong the 1944 International Sanitary Convention	Governance still with UNRRA
1951	International Sanitary Regulation	Governance with WHO; plague, cholera, yellow fever, smallpox, typhus, relapsing fever
1969	International Health Regulations (1969) (International Sanitary Regulations Renamed)	Cholera, plague, yellow fever, smallpox, relapsing fever and typhus
1973	International Health Regulations (modifying 1969 version)	Cholera, plague, yellow fever, smallpox. Requirement for cholera vaccination dropped
1981	International Health Regulations (modifying 1969 version)	Smallpox removed post eradication. Back to cholera, plague and yellow fever
2005	International Health Regulations (2005)	Any public health emergency of international concern

Frameworks for EID





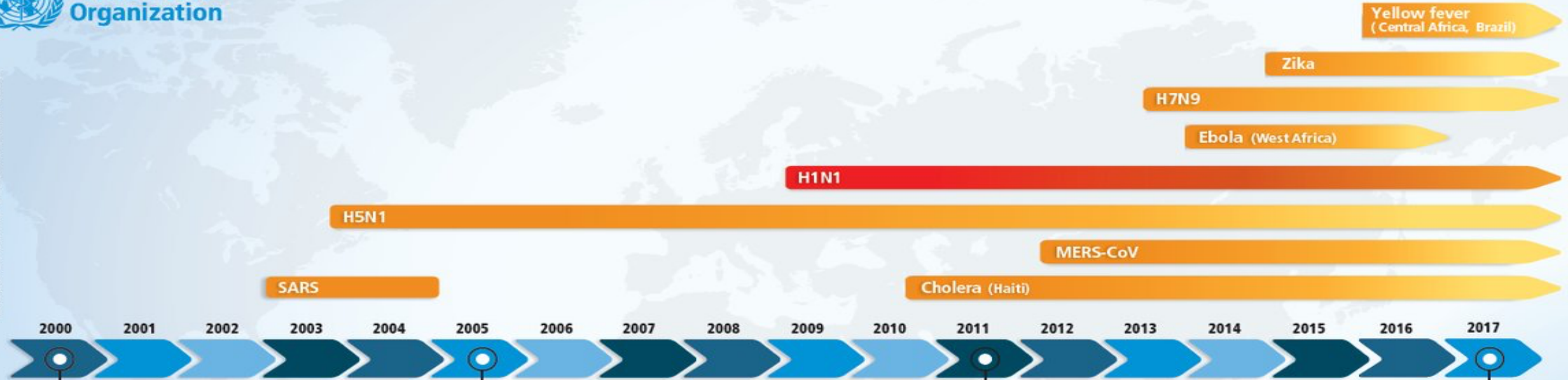
UK Biological Security Strategy

Pillars:

- Understand
- Prevent
- Detect
- Respond

Prevent biological risk, through international engagement in:

- WHO *
- FAO
- OIE
- GHSA *
- BWC *
- UNSGM
- GP
- Australia Group
- GHSI
- European and Mediterranean Plant Protection Organization (EPPO)
- United nations Inter-Agency Coordination Group on AMR (IACG)



GAVI

Gavi, the Vaccine Alliance, is an international organisation that was created in 2000 to improve access to new and underused vaccines for children living in the world's poorest countries.

GOARN

The Global Outbreak Alert and Response Network (GOARN) is a technical collaboration of existing institutions and networks who pool human and technical resources for the rapid identification, confirmation and response to outbreaks of international importance.

IHR (2005)

The International Health Regulations (2005) or IHR (2005) are an international law which helps countries work together to save lives and livelihoods caused by the international spread of diseases and other health risks. The IHR (2005) aim to prevent, protect against, control and respond to the international spread of disease while avoiding unnecessary interference with international traffic and trade.

PIP Framework

The Pandemic Influenza Preparedness (PIP) Framework brings together Member States, industry, other stakeholders and WHO to implement a global approach to pandemic influenza preparedness and response. Its key goals include:

- to improve and strengthen the sharing of influenza viruses with human pandemic potential; and
- to increase the access of developing countries to vaccines and other pandemic related supplies.

PIP Review

IHR Review

LEGEND

Epidemic

Pandemic



Timeline

Major infectious threats in the 21st Century
& collaboration mechanisms to fight against them

What did States Parties agree to do?

(Articles 4, 5, 13, 44 and Annex 1)



Annex 1 defines IHR (2005) core capacity requirements

National

- Detect unexpected disease or deaths
- Assess reports within 48 hours
- Notify WHO
- Support or implement control measures

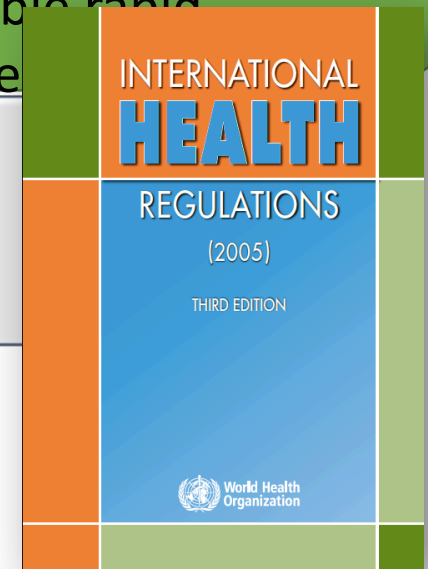
Intermediate

- Detect unexpected disease or deaths
- Assess and confirm reported events
- Report to national level
- Support or implement control measures

Local

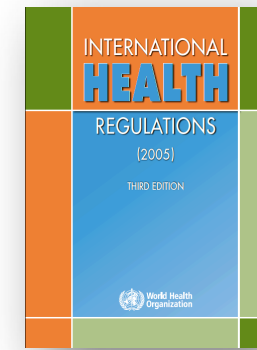
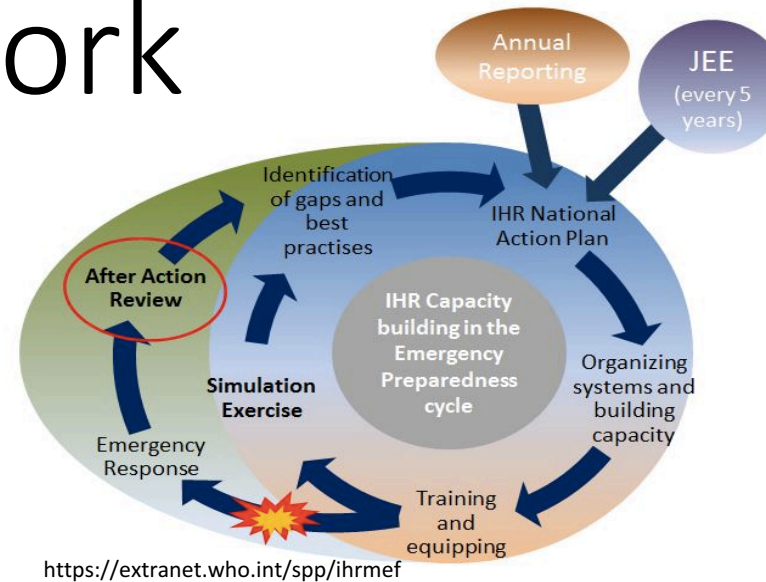
- Detect unexpected disease or deaths
- Assess events immediately
- Report essential information to appropriate level
- Implement preliminary control measures

- Epidemiological, laboratory, logistical support
- Containment and control measures
- Coordination with other ministries
- Information sharing
- Operational national public health emergency response plan
- Deployable rapid response

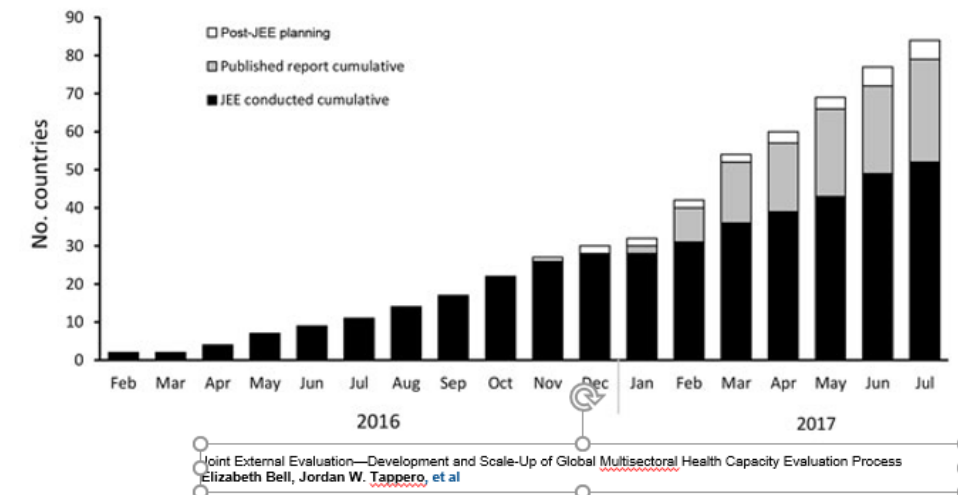


Current IHR Monitoring and Evaluation Framework

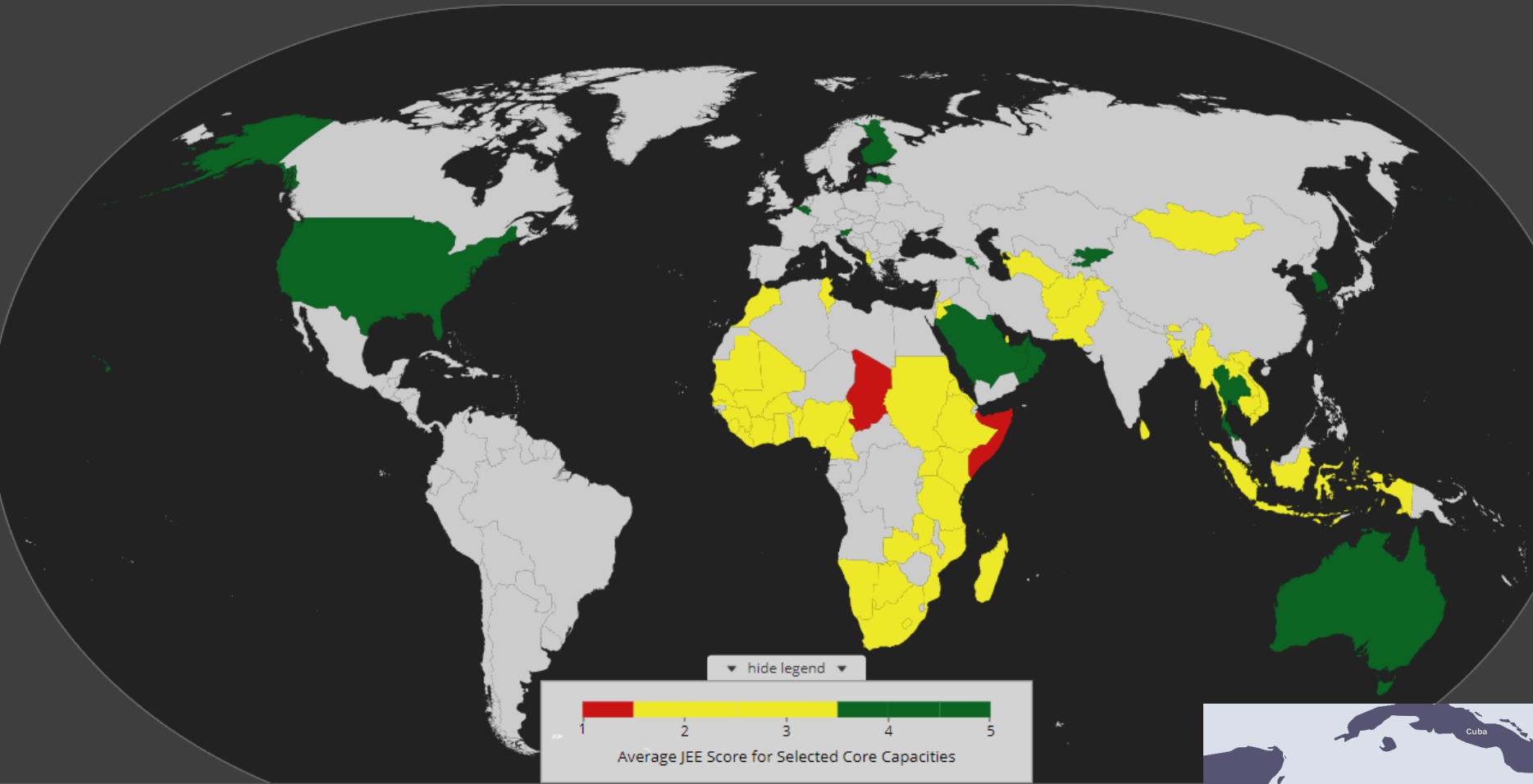
1. Annual Reporting
obligatory self reporting
2. After action review
voluntary, real events
3. Simulation exercises
voluntary, non-real events
4. Joint External evaluations
voluntary, repeat every ~5 years



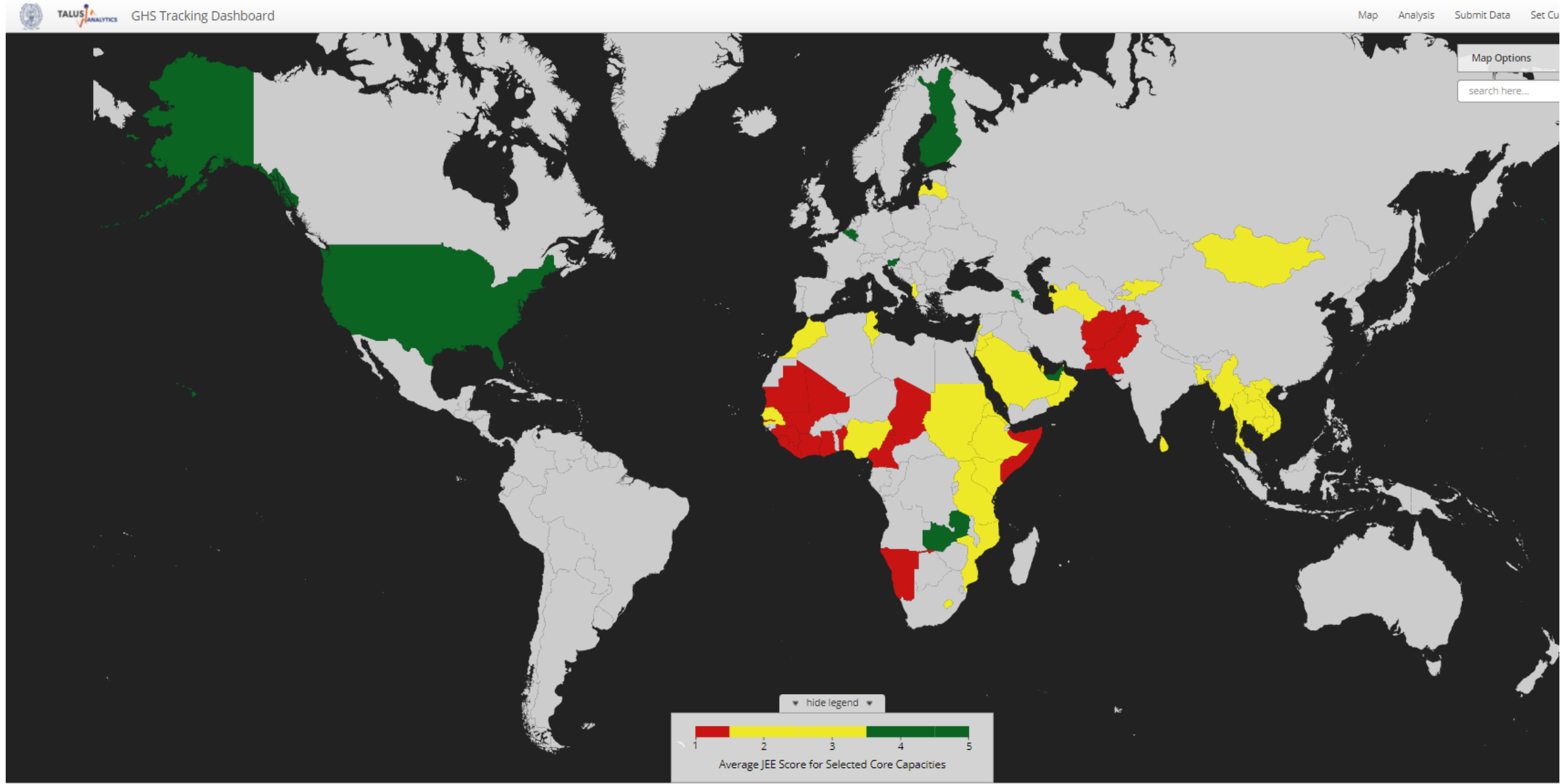
Joint External Evaluation (JEE) Scale Up



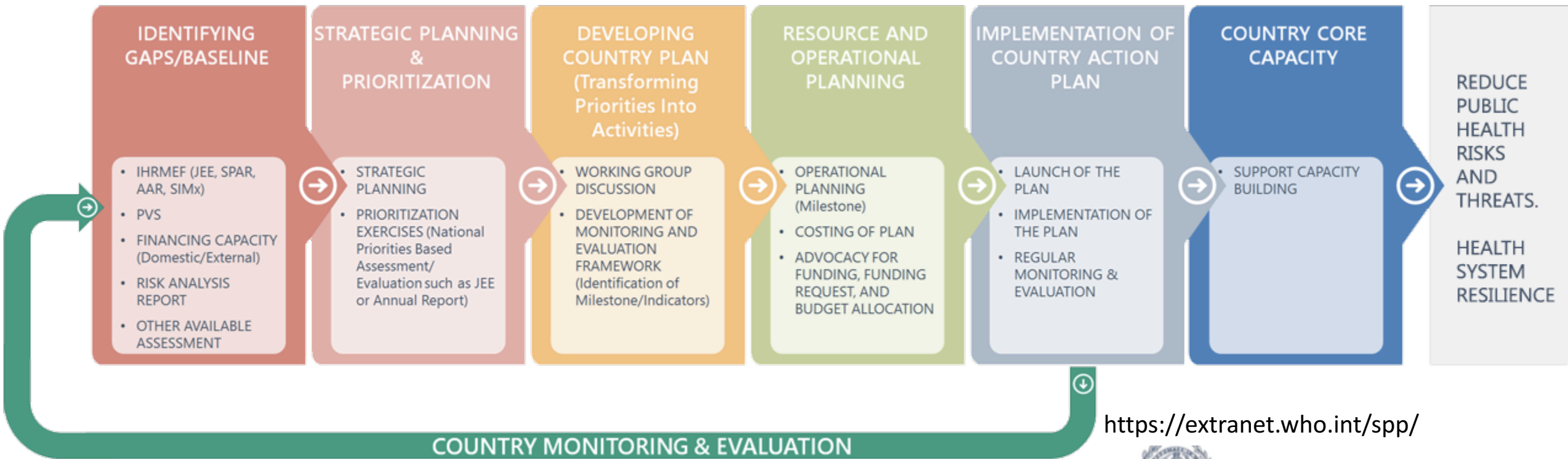
Choose country or organization name to view details



JEE Scores for AMR: tracking.ghscosting.org



WHO System for Health Security M &E



<https://extranet.who.int/spp/>



GEORGETOWN UNIVERSITY
Georgetown University Medical Center
Center for Global Health Science and Security

Costing IHR Implementation

Welcome to the IHR Costing Tool



The IHR Costing Tool helps users generate and review cost estimates to support practical planning for sustainable capacity development to prevent, detect, and respond to public health threats, as defined by the International Health Regulations (IHR).

This tool provides a framework to calculate costs for implementing and enhancing IHR core capacities. Costs are estimated by applying country-specific user input data to cost calculations developed using best practices for achieving the technical standards specified in the Joint External Evaluation Tool (JEE).

Note: This tool is designed to be used in Google Chrome or Mozilla Firefox.

Start (English)

Commencer (Français)

<https://ghscosting.org>

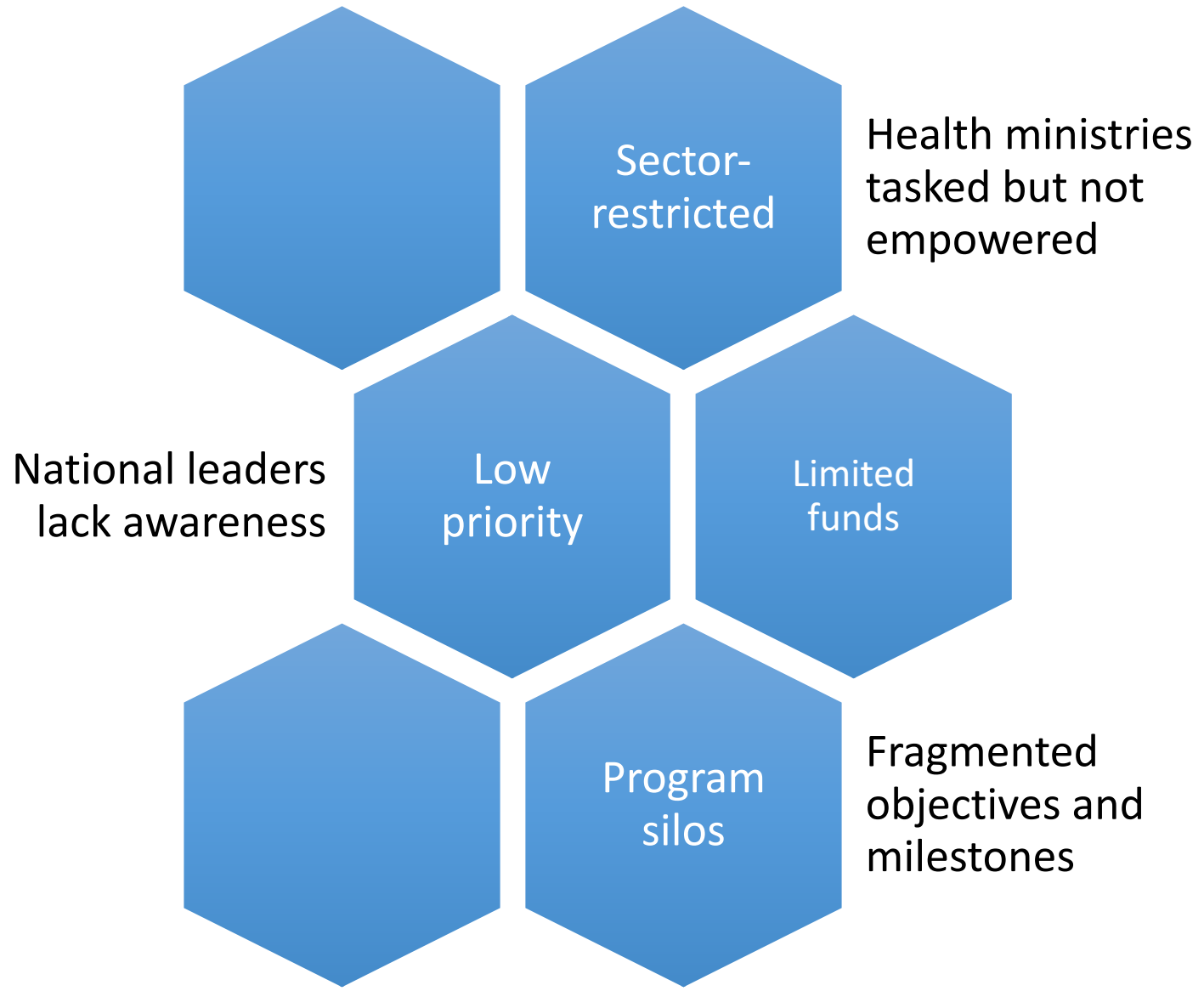
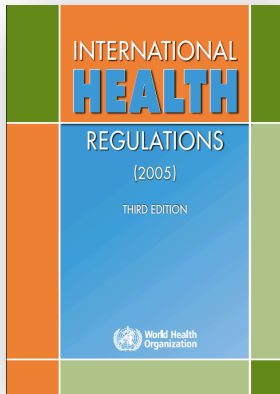
<https://demo.ghscosting.org>



GEORGETOWN UNIVERSITY
Georgetown University Medical Center
Center for Global Health Science and Security

Built by TALUS
ANALYTICS

Unacceptably
slow progress
toward IHR
core
capacities



Global Health Security Agenda (GHSA) launched in February 2014



Accelerate
implementation
of IHR and other
health security
frameworks

Advance
progress toward
a world safe and
secure from
infectious
disease threats

Bring together
nations to make
new, concrete
commitments to
capacity
building

Elevate global
health security
as a priority for
leaders
worldwide

A world map with countries colored in red and blue. The map includes labels for major countries and their ISO codes. The red countries are: Canada, United States, Mexico, Brazil, Argentina, Peru, Colombia, Venezuela, Ecuador, Guyana, Suriname, French Guiana, United Kingdom, Germany, Poland, Ukraine, Turkey, Iran, Iraq, Saudi Arabia, Egypt, Libya, Algeria, Tunisia, Morocco, Mali, Niger, Chad, Sudan, Ethiopia, Kenya, Uganda, Rwanda, Burundi, Tanzania, Zambia, Zimbabwe, Botswana, Namibia, South Africa, India, Pakistan, China, Mongolia, Japan, South Korea, North Korea, Laos, Vietnam, Cambodia, Thailand, Myanmar, Indonesia, Philippines, Malaysia, Singapore, Brunei, Timor-Leste, and Australia. The blue countries are: Russia, Belarus, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Afghanistan, Nepal, Bhutan, Sri Lanka, and Maldives.

11 Global Health Security Action Packages

... across **3** priority areas

... to achieve **3** critical health security impacts

- Antimicrobial Resistance
- Zoonotic Diseases
- Biosafety & Biosecurity
- Immunization



PREVENT

Prevent avoidable outbreaks

-
- National Laboratory System
 - Real-time Surveillance
 - Reporting
 - Workforce Development



DETECT

Detect threats early

-
- Emergency Operations Centers
 - Linking Public Health with Law Enforcement & Multisectoral Rapid Response
 - Medical Countermeasures & Personnel Development



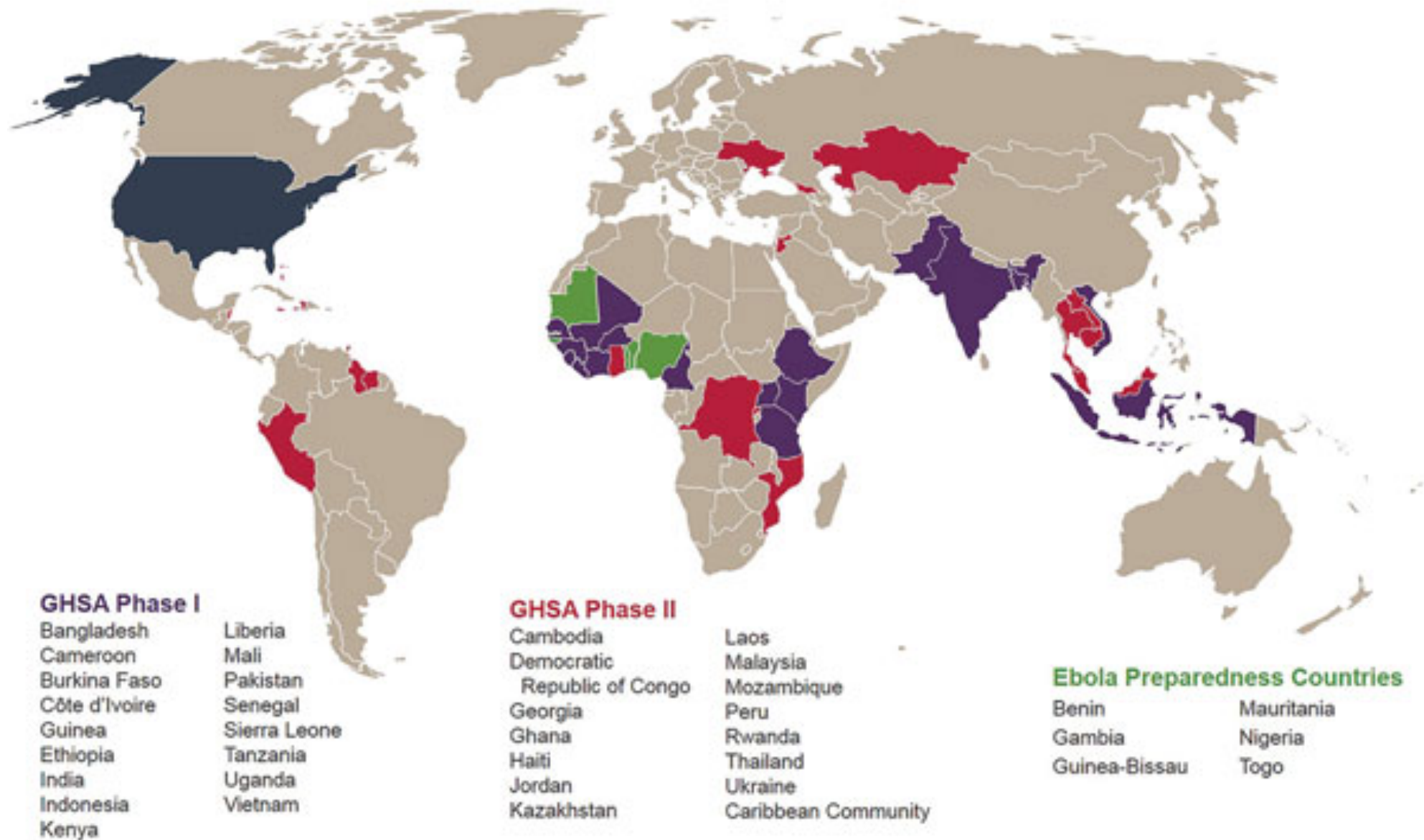
RESPOND

Respond rapidly and effectively

GHSA Success: Political Recognition and Coordination



GHSA Funding from USG



**MARKETS**

Bank of America:
No More Free Checking
for Customers With ...

**U.S. NEWS**

Colleges Are Caught in
the Free-Speech
Crossfire

**MARKETS**

Fear the Unknown
at General Electric

**U.S. NEWS**

Flu Season
Continues to Worsen

**WSJ**
PODCASTS**THE FUTURE
OF EVERYTHING**

Explore the challenges and
possibilities of our impending
way of life.

 Listen on
Apple Podcasts**U.S.**

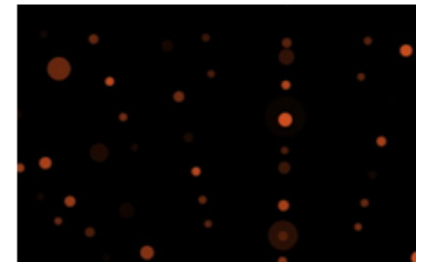
CDC to Scale Back Work in Dozens of Foreign Countries Amid Funding Worries

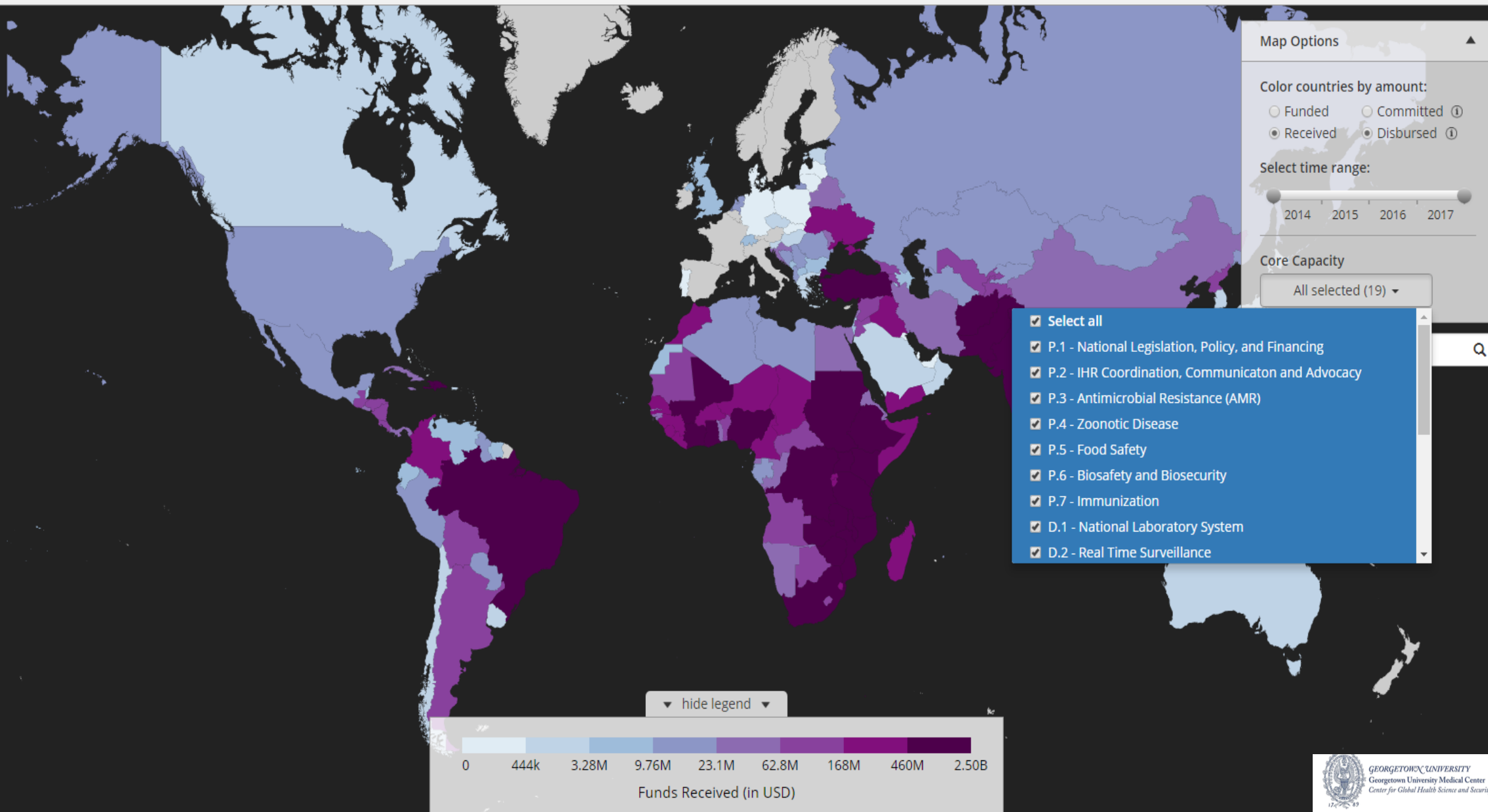
Efforts to prevent infectious-disease epidemics and other health threats were funded mostly through a five-year supplemental pac

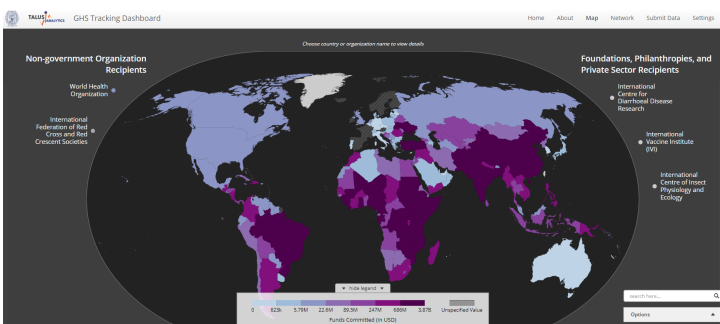
By [Betsy McKay](#)

Jan. 19, 2018 4:51 p.m. ET

The Centers for Disease Control and Prevention plans to scale back or discontinue its work to prevent infectious-disease epidemics and other health threats in 39 foreign countries because it expects funding for the work to end, the agency told employees.

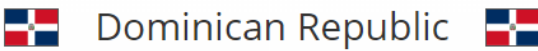






Tracking.ghscosting.org

- Click to show:
- All Funding
 - GHSA Funding Only ①



Dominican Republic

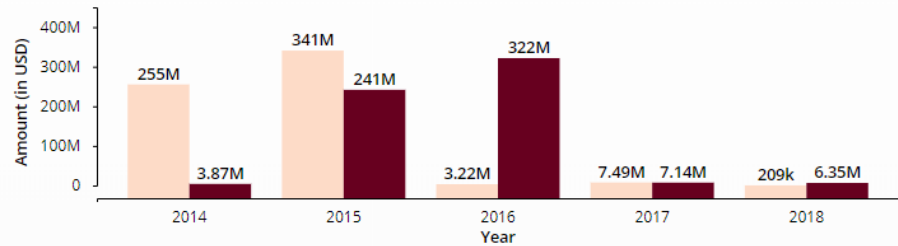
Recipient Profile

Switch to Funder Profile

Total Funds Received from 2014 to 2018

607M USD
Committed
580M USD
Disbursed

View All Funds

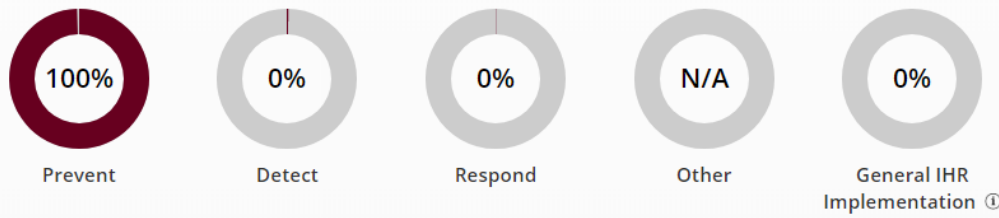


Data Sources

Funding by Core Element

Percentages shown for each core element.

- Disbursed Funds
- Committed Funds



Data Sources

Funding by Core Capacity ①

The chart below shows the funds committed by core capacity. Only funded core capacities are shown. Hover over a bar to see additional funding details.

- Disbursed Funds
- Committed Funds

Core Capacity	Funds Committed (USD)
P.1 National Legislation...	1,700M USD
D.2 Road Travel...	1,700M USD
D.4 Workforce Development...	1,700M USD
R.2 Emergency Response...	200M USD
D.1 National Laboratory...	200M USD
General IHR Implementation...	66.6M USD
R.1 Preparedness...	66.6M USD
P.4 Zoonotic Disease...	67.8M USD
P.3 Antimicrobial Resistance...	21.9M USD
P.2 IHR Coordination...	16.7M USD
P.7 Immunisation	8.9M USD

Top Funders

The table below displays funders in order of amount of funds committed. Click on a row to view details.

- Disbursed Funds
- Committed Funds

Funder	Total Committed	Prevent	Detect	Respond	Other	General IHR ①
Inter-American Development Bank	550M USD	550M USD	0 USD	0 USD	0 USD	0 USD
World Bank	30.0M USD	30.0M USD	0 USD	0 USD	0 USD	0 USD
United States	12.3M USD	0 USD	1.60M USD	300k USD	0 USD	0 USD
Global Fund	8.27M USD	0 USD	0 USD	0 USD	0 USD	0 USD
United Nations Population Fund	2.07M USD	0 USD	222k USD	0 USD	0 USD	0 USD
World Health Organization	1.63M USD	717k USD	517k USD	230k USD	0 USD	64.4k USD
Japan	1.38M USD	0 USD	0 USD	0 USD	0 USD	0 USD
Spain	410k USD	71.6k USD	167k USD	0 USD	0 USD	0 USD
United Nations World Food Programme (WFP)	209k USD	0 USD	0 USD	0 USD	0 USD	0 USD
Korea, Republic of	163k USD	0 USD	0 USD	0 USD	0 USD	0 USD

Showing 1 to 10 of 16 entries

Previous 1 2 Next

In-kind Contributions Received

The table below displays in-kind contribution providers in alphabetical order. Click on a row to view details.

- Provided Contributions
- Committed Contributions

Provider	Purpose of contribution
Canada	IHR programming support

Showing 1 to 1 of 1 entries

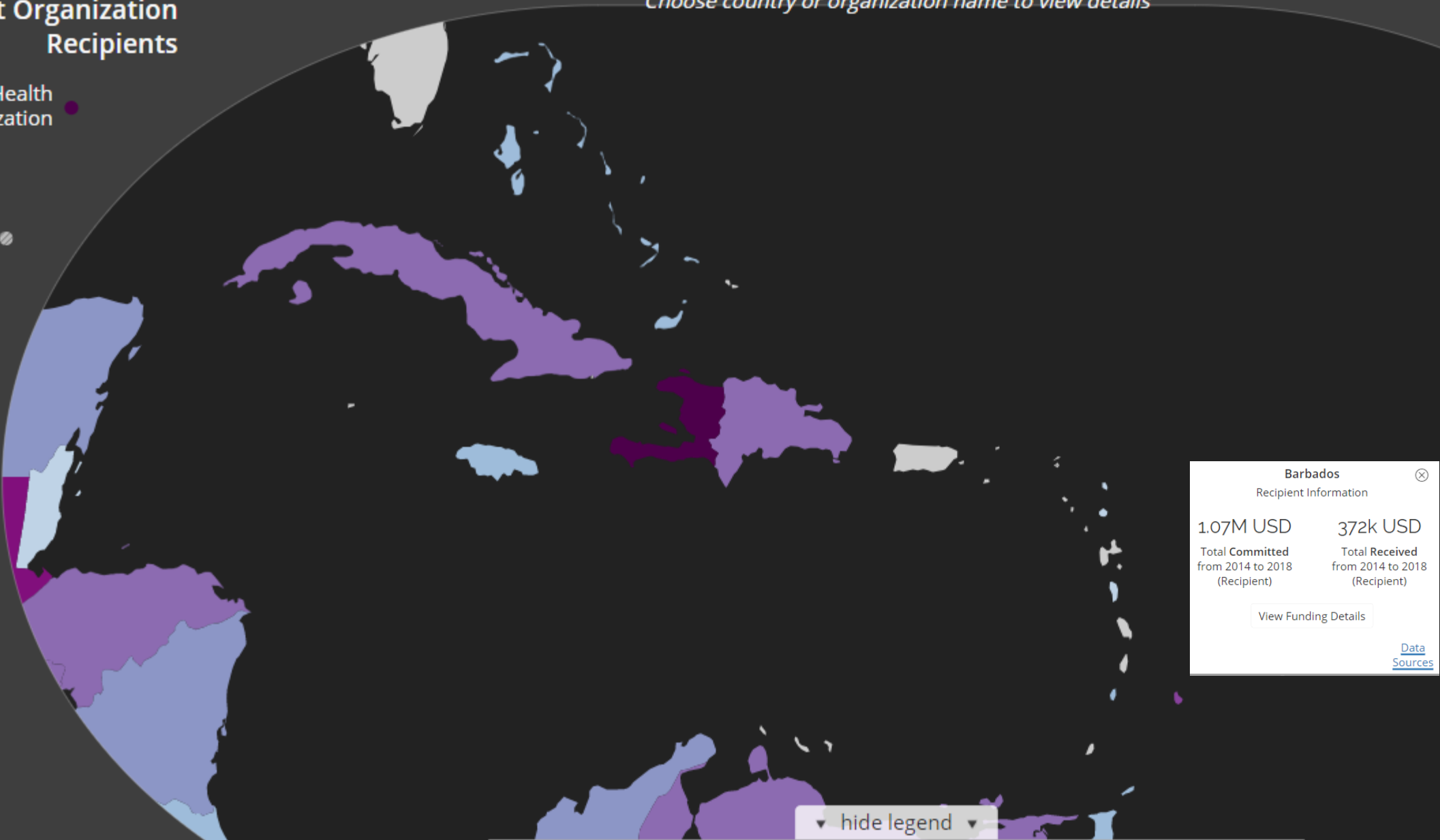
Previous 1 Next

Non-government Organization Recipients

Choose country or organization name to view details

World Health Organization

International Federation of Red Cross and Red Crescent Societies



Barbados

Recipient Information

1.07M USD

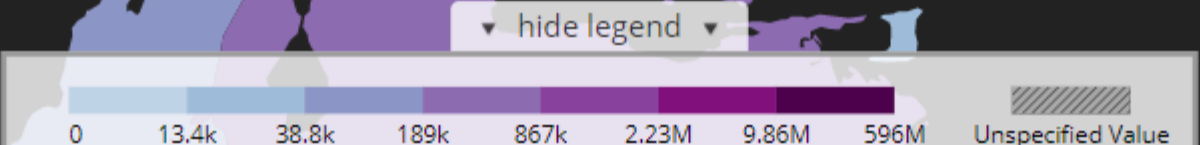
Total Committed from 2014 to 2018 (Recipient)

372k USD

Total Received from 2014 to 2018 (Recipient)

View Funding Details

[Data Sources](#)



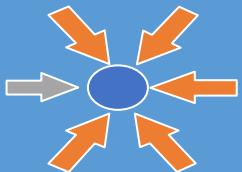
Key challenges for financing preparedness



Competing needs for resources within the health sector, which result in higher priority for curative care at the expense of investments in strengthening public health capabilities



High uncertainty of direct reward from investments in preparedness – not easy to ‘sell’ an investment which, if successful, results in something avoided

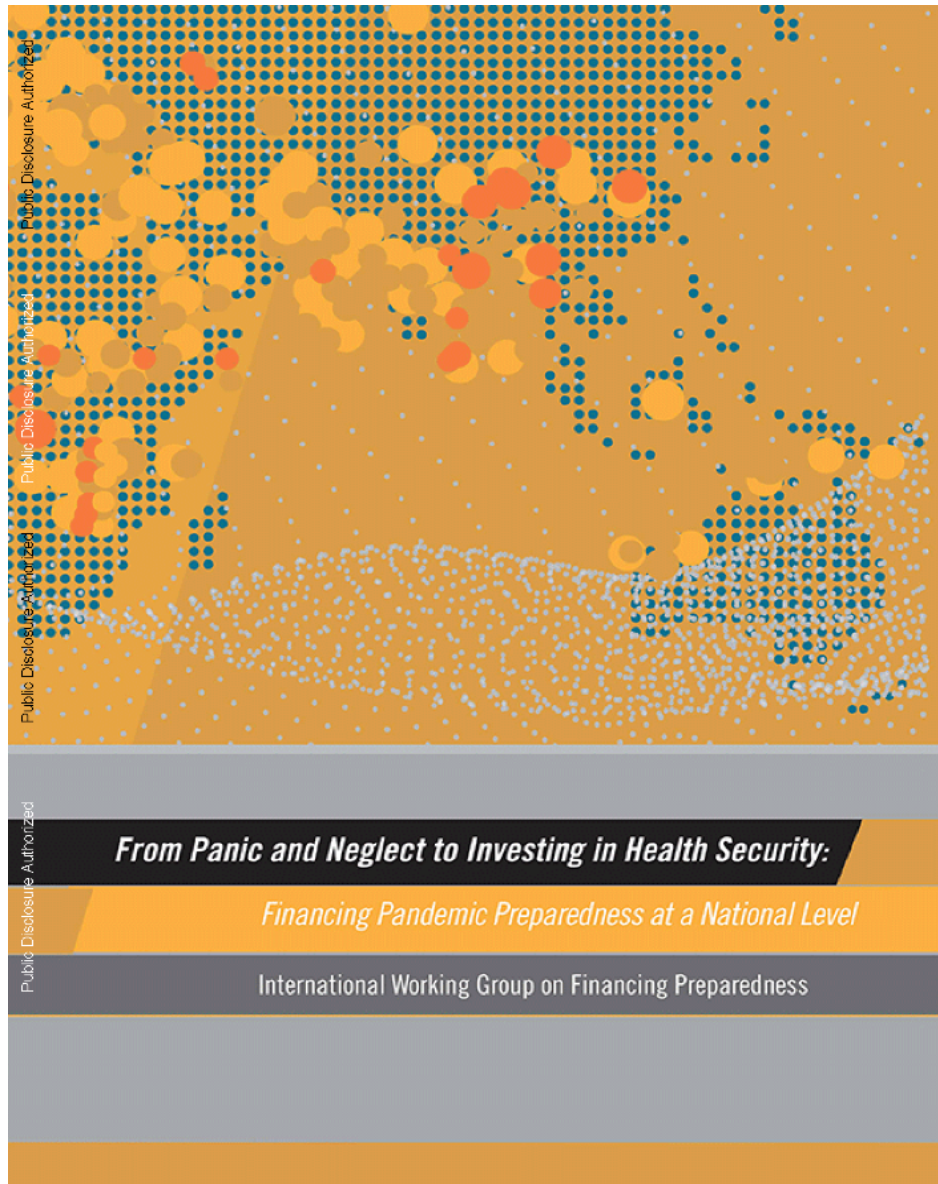


Competing investment projects in other sectors with higher/more immediate perceived return, in the context of constrained resources



Multi-sectoral, cross-department and multi-level (global, regional, national and sub-national) coordination and efforts needed for effective implementation

Financing preparedness at a national level



- All countries should complete JEE/PVS assessments and convert results into costed plans
- Countries should prioritise health security in budgets and increase domestic resource mobilisation where necessary
- Development partners should focus on: 1) one-off capital investments; 2) regional initiatives; 3) failed/fragile states
- National governments should engage the private sector in preparedness and response planning
- Insurance should be leveraged to finance response and incentivise better preparedness
- IMF/WB should incentivise national investment in preparedness (via Art IV, CPIA, SCD)

With \$75 billion in commitments, IDA 18 offers a unique opportunity to transform development in the world's poorest countries

Highlights

- Blending donor \$\$\$ with internal resources and funds raised through debt markets (\$3 for every \$1 contribution)
- Resources for fragile states doubled to \$14.2 billion
- New \$2.5 billion Private Sector Window
- New \$2b Refugee sub-window
- CRW scaled up from \$0.8b to \$3.0b
- Introduces CAT-DDO for IDA countries

Special health themes

- Support at least 25 countries in developing pandemic preparedness plans
- Support at least 25 countries in developing frameworks for governance and institutional arrangements for multi-sectoral emergency preparedness, response and recovery

What this means for crisis response and preparedness

- Help countries develop response plans
- Help countries strengthen preparedness
- Help countries develop pipeline for secured funding to respond to an outbreak

Pandemic Emergency Financing Facility (PEF)

The objectives of the PEF are to:

- make available essential surge financing to key responders, including, governments, multilateral agencies and civil society organizations, to respond to an outbreak with pandemic potential and to minimize its health and economic consequences
- help catalyze the creation of a global market for pandemic insurance instruments

Developed by WBG in collaboration with WHO and other public and private sector partners

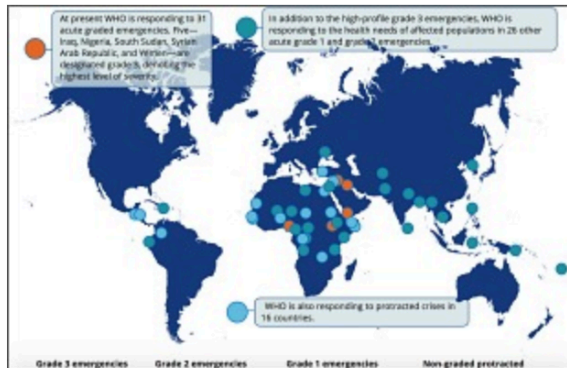
Provides coverage of up to US\$ 500 million over three years

How the PEF works



WHO Health Emergency Programme

Outbreaks and crises



WHO

WHO has an essential role to play in supporting Member States to prepare for, respond to and recover from emergencies with public health consequences.

- By country
- By disease

What we do



From prevention through preparedness to early warning, response, and early recovery, the WHO Health Emergencies programme is operational.

- Q&A: WHO's Health Emergencies Programme
- Video: WHO's Health Emergencies [📺](#)
- Training and Learning
- Country capacity strengthening
- Health security, travel and transport
- International Health Regulations (IHR)

Funding



WHO/C. Black

WHO thanks all of the contributors that provide funding or in-kind contribution for WHO's work for emergencies.

- Contingency fund for emergencies
- Humanitarian response funding
- WHO Humanitarian Response Plans 2018
- Budget: key figures [📊](#)

WHO Contingency Fund for Emergencies

ESSENTIAL MEDICINES AND MEDICAL SUPPLIES

To ensure life-saving medicines and emergency health kits arrive rapidly where needed.

COORDINATED DISTRIBUTION OF MEDICINES

To ensure that the right medicine reaches vulnerable populations.

ACCESS TO WATER AND SANITATION

To ensure that cholera and other waterborne diseases don't spread.

ACCESS TO HEALTH SERVICES

To ensure that hospitals are functional and are staffed with health professionals.



RAPID DEPLOYMENT OF TECHNICAL EXPERTS

To ensure that the right expertise is rapidly available.

DISEASE DETECTION AND REPORTING

To ensure that enough vaccinations are in the right place in case of outbreaks.

DISEASE SURVEILLANCE AND VACCINATION

To prevent disease outbreaks and protect the people in affected areas.

COORDINATION WITH HEALTH PARTNERS

To ensure that the right help goes to the right place using the right partners.

Funding up to US\$ 500 000
can be released in
24 H
for a rapid emergency response

WHO Contingency Fund for Emergencies

CFE DONORS (US\$)

Germany	13 930 958
Japan	10 833 800
United Kingdom	10 536 834
China	2 000 000
Canada	1 481 807
France	1 418 218
Sweden	1 159 555
Netherlands	1 082 514
India	1 000 000
Republic of Korea	1 000 000
Estonia	86 045

TOTAL 44 529 731



US\$ 100 million target
55% funding gap

List of allocations since inception in US\$ (up to 22 December 2017)

Country	Emergency	Type	Amount (US \$)	Date
Ethiopia	El Niño	Humanitarian	1 000 654	Nov-15
Regional Africa	Yellow Fever (Angola, DRC)	Disease Outbreak	4 338 172	Jan-16
Global	Zika Virus	Disease Outbreak	3 600 000	Feb-16
Libya	Conflict	Humanitarian	350 000	Feb-16
Fiji	Cyclone Winston	Humanitarian	447 953	Feb-16
Uganda	Yellow Fever	Disease Outbreak	100 000	May-16
Papua New Guinea	El Niño	Humanitarian	483 000	May-16
Democratic Republic of Congo	Cholera	Disease Outbreak	1 839 880	Jul-16
Nigeria	Conflict	Humanitarian	3 304 678	Aug-16
Niger	Rift Valley Fever	Disease Outbreak	500 000	Sep-16
Haiti	Hurricane Matthew	Humanitarian	250 000	Oct-16
Yemen	Cholera	Disease Outbreak	506 000	Oct-16
Yemen	Health and Nutrition	Humanitarian	29 011	Dec-16
United Arab Emirates	Legionnaires' Disease	Disease Outbreak	18 000	Dec-16
Cameroon	Health and Nutrition	Humanitarian	500 000	Feb-17
São Tomé and Príncipe	Necrotising Cellulitis	Disease Outbreak	300 000	Feb-17
Chad	Hepatitis E	Disease Outbreak	100 000	Mar-17
South Sudan	Famine	Humanitarian	625 545	Mar-17
Somalia	Cholera	Disease Outbreak	99 940	Mar-17
Regional Africa	Famine (Horn of Africa)	Humanitarian	945 000	Mar-17
Maldives	Influenza	Disease Outbreak	100 000	Mar-17
Ethiopia	Acute Watery Diarrhea	Disease Outbreak	2 300 000	Apr-17
Burundi	Malaria	Disease Outbreak	100 000	Apr-17
Nigeria	Meningitis	Disease Outbreak	540 400	May-17
Occupied Palestinian Territories	Shortage of medicines	Humanitarian	362 000	May-17
Vanuatu	Cyclone Donna	Humanitarian	80 000	May-17
Democratic Republic of Congo	Ebola	Disease Outbreak	2 000 000	May-17
Philippines	Conflict (Marawi)	Humanitarian	48 760	Jun-17
Somalia	Famine	Humanitarian	1 442 339	Jun-17
Sudan	Acute Watery Diarrhea	Disease Outbreak	500 000	Jun-17
Democratic Republic of Congo	Cholera	Disease Outbreak	280 000	Jun-17
Iraq	Conflict	Humanitarian	1 500 000	Jul-17
Nigeria	Malaria	Disease Outbreak	296 000	Jul-17
Kenya	Cholera	Disease Outbreak	300 000	Jul-17
Burundi	Malaria	Disease Outbreak	328 830	Jul-17
Central African Republic	Conflict	Humanitarian	360 867	Aug-17
Pakistan	Dengue Fever	Disease Outbreak	282 159	Sep-17
Syria	Conflict	Humanitarian	292 000	Sep-17
Sierra Leone	Mudslides	Humanitarian	100 000	Sep-17
Bangladesh	Rohingya Crisis	Humanitarian	500 000	Sep-17
Madagascar	Pneumonic Plague	Disease Outbreak	1 451 248	Sep-17
Uganda	Marburg Virus	Disease Outbreak	500 000	Oct-17
Kenya	Marburg Virus	Disease Outbreak	123 000	Nov-17
Bangladesh	Rohingya Crisis	Humanitarian	1 000 000	Nov-17
Democratic Republic of Congo	Humanitarian	500 000	Nov-17	
Bangladesh	Rohingya Crisis	Humanitarian	1 500 000	Dec-17
Total			36 125 436	

Total US\$ in 2016
15 766 694

Total US\$ in 2017
19 358 088



OIE Tool for the Evaluation
of Performance of Veterinary Services

OIE PVS Tool

Human, Physical
and Financial
Resources



2013

Organisation
Mondiale
de la Santé
Animale

World
Organisation
for Animal
Health

Organización
Mundial
de Sanidad
Animal

OIE



International Strategy for Disaster Reduction

Hyogo Framework for Action 2005-2015: Building the Resilience of Nations and Communities to Disasters

*Extract from the final report of the
World Conference on Disaster Reduction
(A/CONF.206/6)*

Sendai Framework for Disaster Risk Reduction 2015 - 2030



Pandemic influenza preparedness Framework for the sharing of influenza viruses and access to vaccines and other benefits



NAGOYA PROTOCOL ON ACCESS TO GENETIC RESOURCES AND THE FAIR AND EQUITABLE SHARING OF BENEFITS ARISING FROM THEIR UTILIZATION TO THE CONVENTION ON BIOLOGICAL DIVERSITY TEXT AND ANNEX



Convention on
Biological Diversity

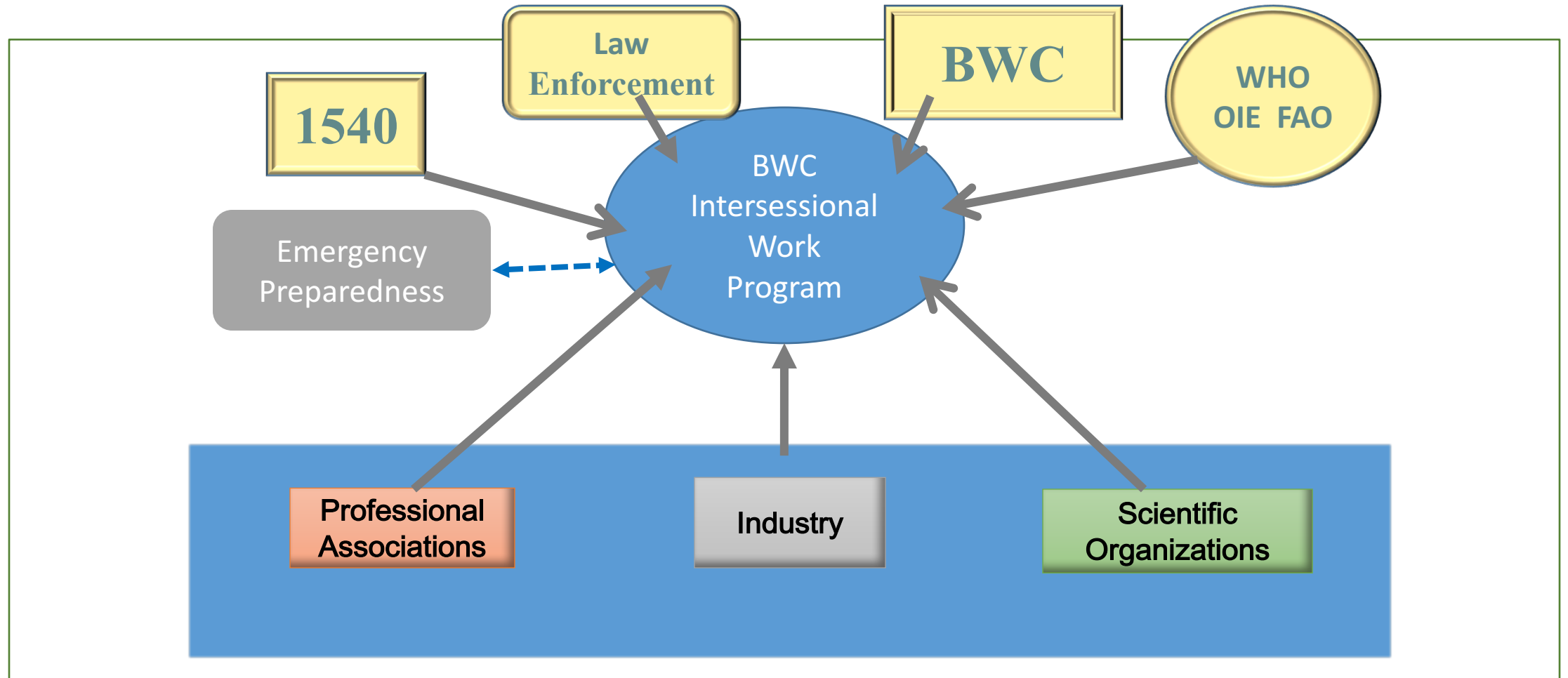
Biological and Toxin Weapons Convention (BWC)

Article	Provision
Article I	Never under any circumstances to acquire or retain biological weapons.
Article II	To destroy or divert to peaceful purposes biological weapons and associated resources prior to joining.
Article III	Not to transfer, or in any way assist, encourage or induce anyone else to acquire or retain biological weapons.
Article IV	To take any national measures necessary to implement the provisions of the BWC domestically.
Article V	To consult bilaterally and multilaterally to solve any problems with the implementation of the BWC.
Article VI	To request the UN Security Council to investigate alleged breaches of the BWC and to comply with its subsequent decisions.
Article VII	To assist States which have been exposed to a danger as a result of a violation of the BWC.
Article X	To do all of the above in a way that encourages the peaceful uses of biological science and technology.

International Assistance
and Cooperation



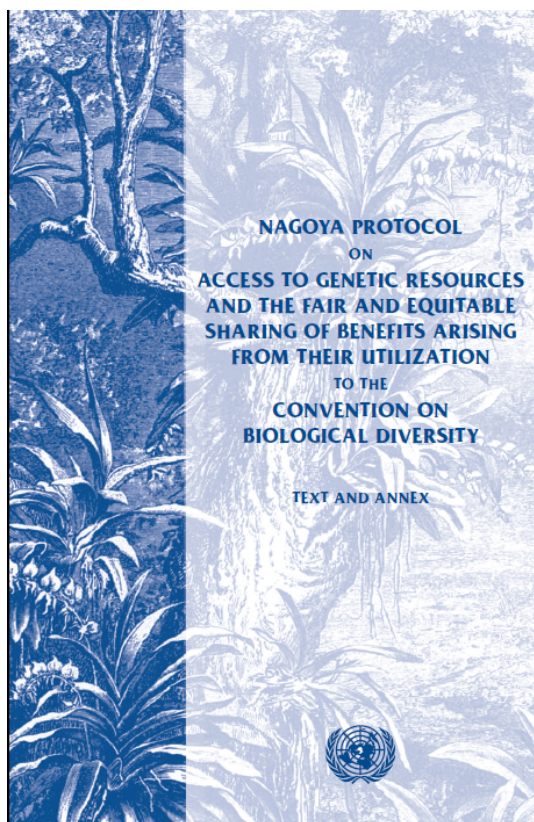
The BWC: An Integrated Approach





Convention on Biological Diversity

CBD – Nagoya Protocol (2010)



Article 6(1): In the exercise of sovereign rights over natural resources, and subject to domestic access and benefit-sharing legislation or regulatory requirements, access to genetic resources for their utilization shall be subject to the prior informed consent of the Party providing such resources that is the country of origin of such resources or a Party that has acquired the genetic resources in accordance with the Convention, unless otherwise determined by that Party

Article 8(b): Pay due regard to cases of present or imminent emergencies that threaten or damage human, animal or plant health, as determined nationally or internationally. Parties may take into consideration the need for expeditious access to genetic resources and expeditious fair and equitable sharing of benefits arising out of the use of such genetic resources, including access to affordable treatments by those in need, especially in developing countries; .

Pandemic influenza preparedness Framework

for the sharing of influenza viruses
and access to vaccines and
other benefits



- Sharing of PIP biological materials within the GISRS network of laboratories is governed by Standard Material Transfer Agreement 1 (SMTA1)
- transferring PIP biological materials within and to entities outside GISRS
- handling of PIP biological materials
- use of the Influenza Virus Traceability Mechanism (IVTM)
- research & publications
- intellectual property rights
- dispute resolution
- Art 1 (11): WHO Member States “recognize the sovereign right of States over their biological resources”

Art 3 (1): This Framework applies to the sharing of H5N1 and other influenza viruses with human pandemic potential and the sharing of benefits.

Art 3 (2): This Framework does not apply to seasonal influenza viruses or other non-influenza pathogens or biological substances that may be contained in clinical specimens shared under this Framework.

HEALTH IN THE SDG ERA



World Health Organization

REGIONAL OFFICE FOR Europe

WWW.WHO.INT/SDGS



Global Health Security Index

What is the GHS Index?

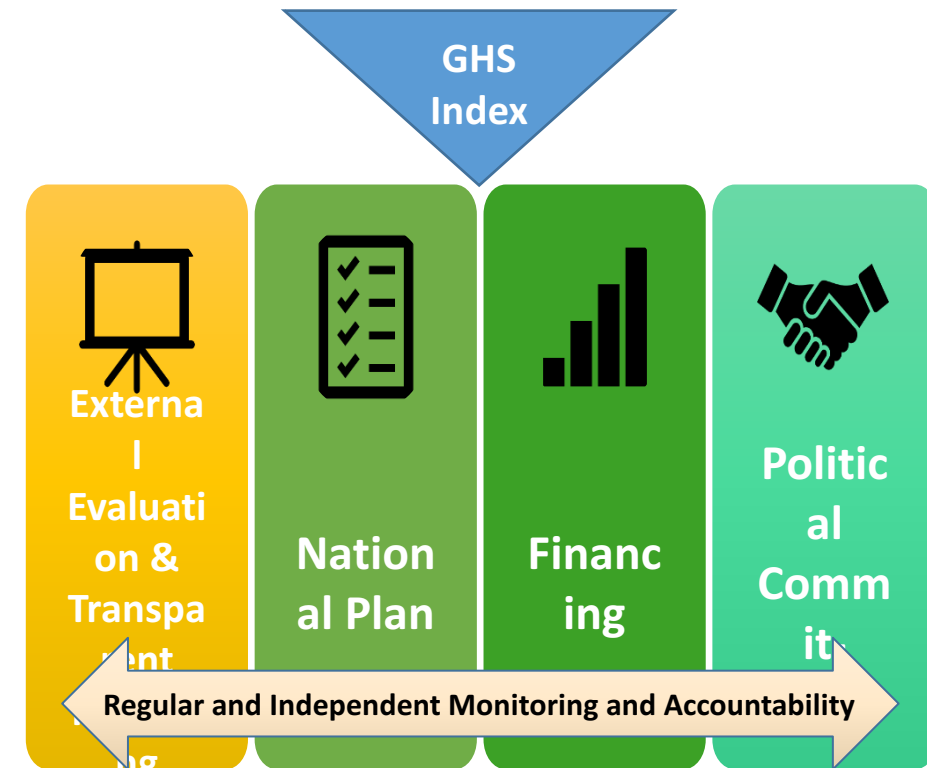
- Country-level assessment – JEE & non-JEE countries
- Measured by an independent non-governmental entity
- Informed by an International Panel of Experts
- Publically available

What is the GHS Index intended achieve?

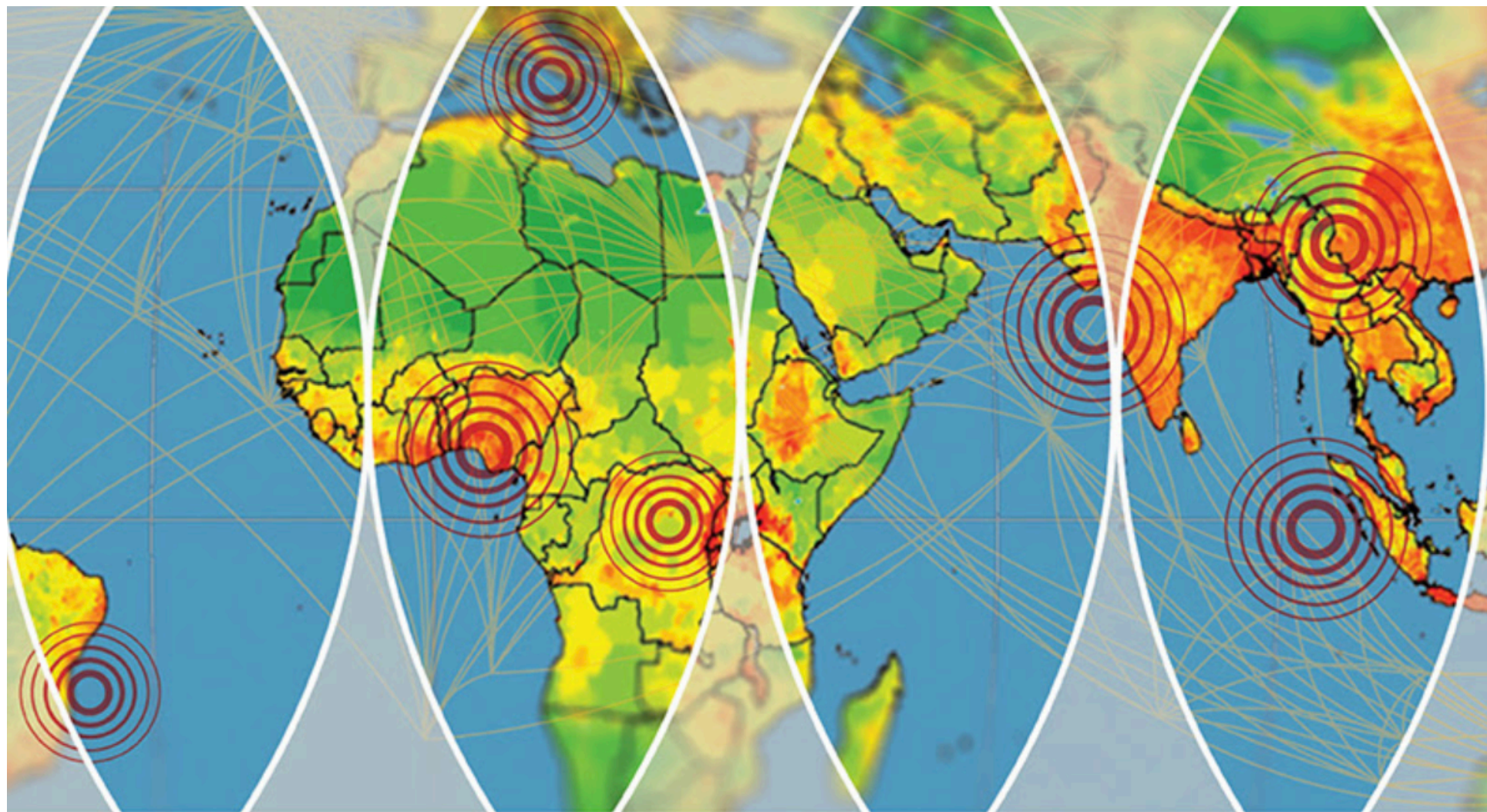
- Motivate regular commitments, financing, and accountability.
- Influence government decision-making on a regular basis
- Help break cycle of panic and neglect

How will the GHS Index relate to JEE and PVS?

- Complementary, not duplicative
- Adds indicators in challenging areas (e.g. One Health, dual use research)
- Adds wider dimensions (**political, economic, social**) that impact bio crises
- Adds indicators on the **broader health system**
- Credits kept **political commitments** to implement and finance identified gaps.







SAVE THE DATE | November 4–8, 2018
Finding Outbreaks Faster:
How Do We Measure Progress?

**SALZBURG
GLOBAL
SEMINAR**

BEFORE EPIDEMIC

Prepare for the inevitable



Source: WHO

- ✓ Engage actors from multiple sectors (including Finance Ministers)
- ✓ Build national capacities (per the IHR and PVS)
- ✓ Active engagement in international fora
- ✓ Continue threat assessments
- ✓ Legal and regulatory infrastructure/healthcare infrastructure



Global Health Security 2019

International Convention Centre
Sydney 18-20 June 2019

Progress to date,
opportunities for the future.
www.ghs2019.com

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ghss.georgetown.edu



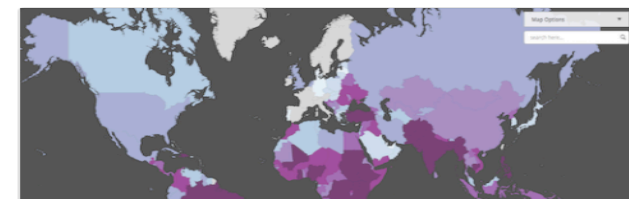
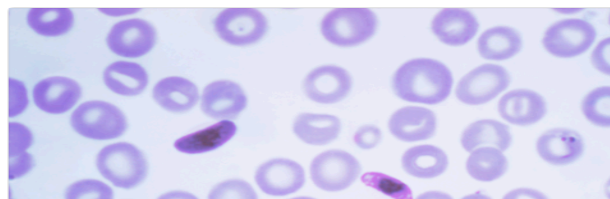
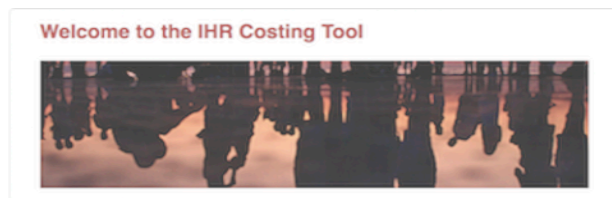
We've Been Busy Lately

Our team has been busy working on a wide variety of topics – from tracking global health security funding, to surveillance methods, to neglected tropical diseases. Check out [some of our recent work!](#)

Projects and Tools

Mapping/strengthen systems and capacity building for disease detection

We combine laboratory backgrounds and systems analysis experience to understand the technical demands for capacity building to prevent, detect, and respond to health emergencies.



Thank you!

@RebeccaKatz5

@GHSS_Georgetown

ghss.georgetown.edu



GEORGETOWN UNIVERSITY

Georgetown University Medical Center

Center for Global Health Science and Security