

# Covid-19 and the R&D Ecosystem

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# The R&D ecosystem has been evolving....



R&D

*product focused  
development*

H1N1



**Preparedness R&D**  
*anticipates  
pathogens of  
concern, develops  
platforms, enabling  
science*

Ebola



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From: Keusch & Lurie, GPMB 2020

# ...toward better pandemic preparedness



R&D

*product focused development*



**Preparedness R&D**  
*anticipates pathogens of concern, develops platforms, enabling science*



**Preparedness and response R&D leverages preparedness but prepositions science components to respond quickly**



**Prototype pathogen approach for pandemic preparedness: world on fire**

Barney S. Graham and Kizzmekia S. Corbett

First published April 30, 2020 - [More info](#)



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From: Keusch & Lurie, GPMB 2020

# Contrasting ecosystems for outbreak R&D

| Activity   | US Responsible funder/ entity | Global Responsible funder/ entity            | What happened during Covid-19 pandemic   |
|--|-------------------------------|--|--|
| <b>Enabling science activities</b>                             |                               |  |  |
| Posting and curating gene sequences over time                  | GenBank                       | GISAID?                                      | GISAID became de facto repository  |
| Receiving, growing and sharing virus samples with laboratories | CDC/NIAID                     | none   | When China did not share samples, Australia led effort once case identified there        |
| Collection and dissemination of biological reference material  | NIAID/CDC                     | none   | Multiple ad hoc, unstandardized efforts  |
| Animal model development                                       | NIAID                         | none   | Limited global resources<br>Demand >>supply  |
| Epidemiology   | CDC                           | Country public health agencies;<br>GOARN/WHO | Data collection often haphazard, poorly standardized; political interference in response |

# Contrasting ecosystems for product development

| Activity   | US Responsible funder/entity | Global Responsible funder/entity | What happened during Covid-19 pandemic  |
|--|------------------------------|----------------------------------|---|
| <b>Product development</b>                         |                              |                                  |   |
| <b>Diagnostics</b>                                 | CDC/NIH/BARDA                | None/FIND?                       | Germany develops first NAT-testing, shared by WHO; remainder of tests slow to develop and scale; FIND and Global Fund part of ACT-A |
| <b>Therapeutics</b>                                | NIAID/BARDA                  | none                             | OWS in the US<br>Therapeutics accelerator started by Gates/Wellcome/Mastercard; now part of ACT-A                                   |
| <b>Vaccines</b>                                    | NIAID/BARDA                  | CEPI?                            | OWS in the US<br>CEPI became 'go-to' entity; China, Russia, others supported internal candidates; part of ACT-A/COVAX               |
| <b>Manufacturing scale up and innovation</b>       | BARDA                        | none                             | OWS in the US<br>Still fundraising to finance globally  |
| <b>Advanced market commitment to purchase</b>      | BARDA                        | none                             | OWS in the US<br>ACT-A/COVAX formed to finance on behalf of countries   |
| <b>Procurement</b>                                 | BARDA                        | none                             | OWS in the US<br>Numerous bilateral deals; 180 countries join COVAX   |
| <b>Allocation, distribution and administration</b> | CDC, state/local             | none                             | OWS/USG in the US<br>WHO, UNICEF through COVAX, country public health agencies  |

# Critical science preparedness gaps in the US



Turning clinical observations into evidence

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Standing clinical trial networks and protocols for:

- Clinical care
  - Therapeutics
  - Other innovation
- 



Inequality and racism

Protecting of science from politicization

# Evolving to an end-to-end global R&D ecosystem

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Agree on core enabling science needs



Preposition funded hubs on each continent

- Advances equity
- Improves global research capacity



Develop pooled global research response fund with immediately releasable \$\$

- Governance
- Triggers
- Preparedness and practice



Develop global strategy end-end for financing a global pandemic science preparedness and response

# Can we get to the desired end state before the next pandemic?



**R&D**  
*product focused development*



**Preparedness R&D**  
*anticipates pathogens of concern, develops platforms, enabling science*



**Preparedness and response R&D**  
*leverages preparedness but prepositions science components to respond quickly*



**End-to-end preparedness and response ecosystem**  
*Basic science through product development, to manufacturing and delivery; comprehensive public health response, fully financed*



# A Foundation for the Future?

**ACCESS TO COVID-19 TOOLS (ACT) ACCELERATOR**  
A Global Collaboration to Accelerate the Development, Production and Equitable  
Access to New COVID-19 diagnostics, therapeutics and vaccines

## DIAGNOSTICS



 **The Global Fund**

**FIND**   
Because diagnosis matters

## THERAPEUTICS



**W**  
wellcome

 **Unitaid**  
Innovation in Global Health

## VACCINES (COVAX)



**CEPI**

**Development & Manufacturing**  
Led by CEPI, with industry

 **Gavi**  
The Vaccine Alliance

**Procurement and delivery at scale**  
Led by Gavi

 **World Health Organization**

**Policy and allocation**  
Led by WHO

**Under Construction**

## Key players

 **wellcome**

**BILL & MELINDA GATES foundation**

**CEPI**

**dcvmn**  
Diversifying Countries Vaccine Manufacturing Network

 **Gavi**  
The Vaccine Alliance



 **IFPMA**

**International Federation of Pharmaceutical Manufacturers & Associations**

 **The Global Fund**

 **IGBA**  
INTERNATIONAL GENETIC AND PROTEOMIC RESEARCH ASSOCIATION

 **Unitaid**  
Innovation in Global Health

 **World Health Organization**