

Rx One health: A prescription to prevent future pandemics

Eric Goosby, MD
Professor of Medicine



Roadmap

A prescription to prevent future pandemics

One health: critical role

COVID-19 – A catalyst for change

Rx One Health:

Improving pandemic **detection**

Strengthening pandemic **response**

Implementing pandemic **prevention** strategies

Why is One Health so important?

- Animal, human and environmental health are fundamentally linked

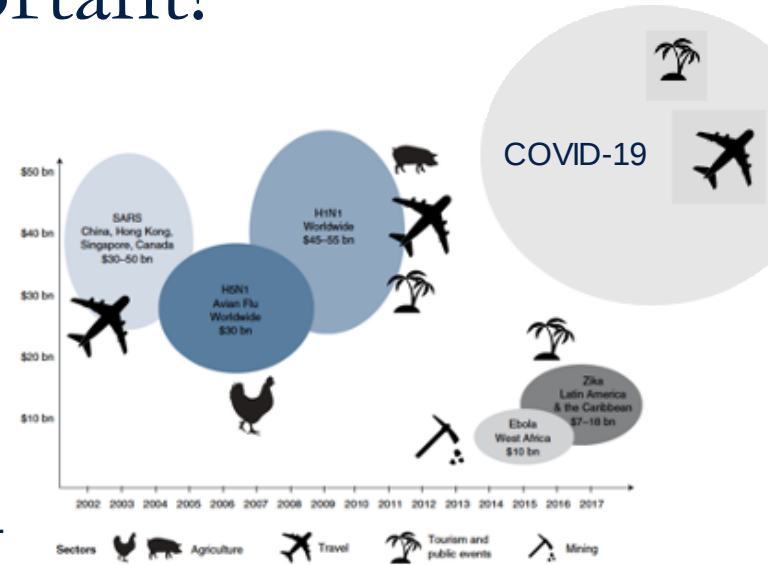
60% infectious disease arise from pathogens shared with animals¹

- Current paradigms for addressing zoonotic disease outbreaks are typically reactive

E.g. HIV, SARS or MERS

- Economic losses from business-as-usual strategies for zoonotic diseases are huge

SARS cost \$50 billion,² despite causing illness to less than 9000 persons; COVID-19's impact, ongoing and \$\$ catastrophic



Economic impacts of disease outbreaks
(icons represent highly-affected sectors)

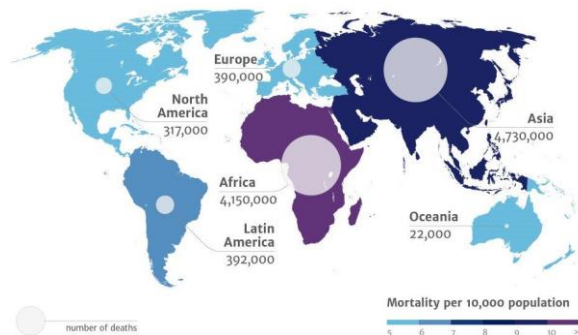
1. Karesh et al (Lancet, 2015); 2. Newcomb J, et al (Bio Econ Res, 2011); 3. World Bank, 2018

Why is One Health so important?

USA alone: Animals consume x2 medically important antibiotics than humans¹



AMR: projected to cause have huge global mortality toll by 2050²



Even pre-COVID growing consensus: action is needed now!



1. O'Neil, (AMR report 2016); 2. Spellberg, et al, (NEJM. 2013)

COVID-19:

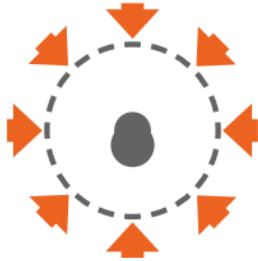
New spotlight on need for ONE Health approach¹



1. Zhang et al., 2020, Current Biology

Rx: One Health – Pandemic Response framework

Detection, Response, Prevention



Global



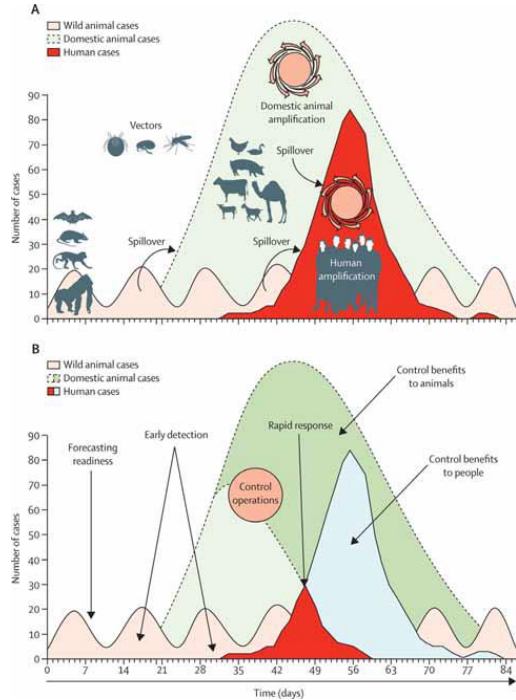
National



Local

Multisectoral, transdisciplinary
Collaborative, transparent, accountable
Shared responsibility

Rx One health: Improving pandemic *detection*



60% of human infectious disease arise from pathogens shared with wild or domestic animals¹

Risks are not limited to low-income countries

Early detection and control efforts reduce disease incidence (light blue) and animals (dark green)¹

1. Karesh et al, Lancet 2015

Rx One health: Improving pandemic *detection* demands new **global** action

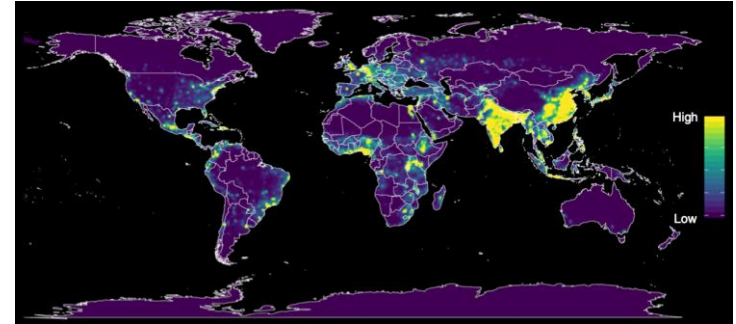
- COVID-19 has revealed frailty of existing global detection mechanisms
- IHR systems were weak; governments not motivated to share public health risks

Post-COVID-19, we must better....

- Incentivize sharing outbreak data
- Empower WHO, re-invigorate IHR, with greater focus on intersectional equity
- Establish health security infrastructure at UN

Rx One health: Improving pandemic *detection* demands new **local** action

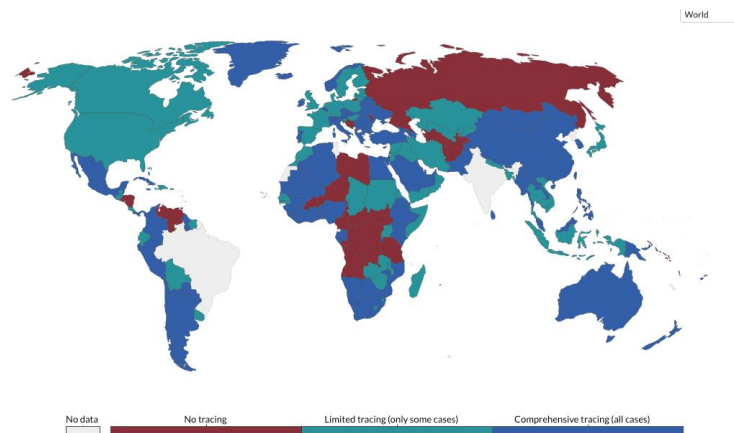
- May not be feasible to monitor all human, animal & environments globally
- But new approaches (e.g. citizen science) & novel technologies (e.g., internet of things) could empower local communities & support traditional surveillance capabilities, especially in spillover hotspots¹



Heat map of predicted risk distribution of zoonotic emerging diseases¹

1. Allen et al, Nature Comms (2008)

Rx One health: strengthening pandemic *response* means investing in health systems



- COVID-19 response: many countries, US included, have *limited* (green) or no (red) contact tracing capability¹
- >40% of previous large emerging disease events linked to lack of public health infrastructure²
- To avoid similar failure in future pandemics all countries, US included, need to strengthen health systems to respond rapidly & coherently

1. Hale et al (2020) Oxford COVID19 Govt. Response tracker; 2. Bogich et al, PLOS Med (2012)

response, integrating health delivery across key sectors

HEALTH DIPLOMACY AND ADVOCACY

Constructive engagement with ministries of health and other key parties to identify health priorities, critical implementation issues and barriers to success

THE PRIVATE SECTOR

Harness the strengths and networks of business, investors and enterprise in both the global North and South to address the identified health priorities in partnership with government

ACADEMIA

Engage across schools of medicine, PH & veterinary medicine to lower the barriers to applying the best science, data solutions, policies, technologies for in-country implementation

NATIONAL GOVT.

Draw upon and be led by government's natural abilities to convene and lead health responses, and seek to grow government ownership

CIVIL SOCIETY & THE INDIVIDUAL

Working with civil society to address local priorities, empowering local community-based organizations to respond, keeping governments & their donor partners accountable for response

Coordinated, accountable
Shared responsibility

Rx One health: Universal Health Coverage (UHC) is critical to pandemic *prevention*¹

- Critical role of Community Health Workers / Primary Care - to support *local* surveillance, containment strategies
- UHC ensures accessible, equitable affordable care – especially for specific under-served communities
- Protects existing system – UHC systems enable coordination of programs & stakeholders

1. Binagwaho, A et al, Devex (2020)

Conclusion



- For any crises that threatens the globe, the problems of any of us are the problems of all of us¹
- COVID-19 reminds us that no country acting alone can respond effectively to human, animal or environmental health threats in a globalized world¹
- To prevent & respond to future pandemic threats: coordinated, multisectoral strategies that are inclusive, participatory & based on principles of shared responsibility

1. Reid, MJA PLOS Med, (2021); Image from CDC One Health, <https://www.cdc.gov/onehealth/index.html>



University of California
San Francisco