

PREVENT FUTURE OUTBREAKS FROM
BECOMING EPIDEMICS

CTR AND HEALTH SECURITY IN AN ERA OF CHANGING BIORISK

“...the next epidemic could originate on the computer screen of a terrorist intent on using genetic engineering to create a synthetic version of the smallpox virus...”


--Bill Gates, February, 2017

Elizabeth Cameron, Cooperative Threat
Reduction Programs for the Next Ten Years and
Beyond, September 18-19, 2017



Shared Goal: Stop Outbreaks at the Source





U.S. and Global Leadership Remain Vital to Counter Biological Threats



**Biological
Risk**



Biological threats can kill millions and cost billions

Pandemics cause political and economic instability

Risk is magnified by global travel, urbanization, terrorist interest in WMD

Cross-border bio events can exacerbate regional tension

Rapidly accelerating technology: Promise & Risk



The Global Health Security Agenda: Builds on the CTR Platform

*To attain a world safe and secure from global health threats posed by infectious diseases...
whether natural, deliberate, or accidental*

- Launched on February 13, 2014
- **Transcends borders** in the fight against biological health threats
- A voluntary, country-driven five-year **IHR** and **PVS** accelerator

Concrete commitment required



First ever GHS targets: build in CTR core priorities



Antimicrobial Resistance



National Laboratory Systems



Emergency Operations
Centers



Zoonotic Diseases



Surveillance



Linking Public Health
with Law Enforcement
and Multisectoral Rapid
Response



Biosafety/Biosecurity



Reporting



Medical
Countermeasures and
Personnel Deployment



Immunization



Workforce Development

U.S. Programs: from Cooperation → Synergy *and Measurable Outcomes*



CDC

Detection, Biosurveillance, Labs, Workforce, Antimicrobial Resistance

USAID

Emerging Pandemic Threats, Zoonotic Disease, Biosurveillance

DoD

Threat Reduction, Force Health Protection, Biosurveillance, Biosecurity

State

Biosecurity Engagement, Health & Health Security Diplomacy

USDA

Technical assistance, Cooperative research, One Health

FBI

Linking law enforcement to public health; Regional engagements



Joint External Evaluations (JEE)

- Prior to 2015, no external assessments.
- Now: more than 50 cross-sectoral external evaluations have been completed; ~30 more scheduled.
- Builds in biosecurity and biosafety

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.	2
	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)	2
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.	3
Antimicrobial Resistance	P.3.1 Antimicrobial resistance (AMR) detection	1
	P.3.2 Surveillance of infections caused by AMR pathogens	1
	P.3.3 Healthcare associated infection (HCAI) prevention and control programs	2
	P.3.4 Antimicrobial stewardship activities	1
Zoonotic Disease	P.4.1 Surveillance systems in place for priority zoonotic diseases/pathogens	2
	P.4.2 Veterinary or Animal Health Workforce	2
	P.4.3 Mechanisms for responding to zoonoses and potential zoonoses are established and functional	2
Food Safety	P.5.1 Mechanisms are established and functioning for detecting and responding to foodborne disease and food contamination.	1
Biosafety and Biosecurity	P.6.1 Whole-of-Government biosafety and biosecurity system is in place for human, animal, and agriculture facilities	2
	P.6.2 Biosafety and biosecurity training and practices	2
Immunization	P.7.1 Vaccine coverage (measles) as part of national program	3
	P.7.2 National vaccine access and delivery	4
National Laboratory System	D.1.1 Laboratory testing for detection of priority diseases	2
	D.1.2 Specimen referral and transport system	3
	D.1.3 Effective modern point of care and laboratory based diagnostics	2
	D.1.4 Laboratory Quality System	1
Real-Time Surveillance	D.2.1 Indicator and event based surveillance systems	4
	D.2.2 Inter-operable, interconnected, electronic real-time reporting system	2
	D.2.3 Analysis of surveillance data	4
	D.2.4 Syndromic surveillance systems	4
Reporting	D.3.1 System for efficient reporting to WHO, FAO and OIE	3/2
	D.3.2 Reporting network and protocols in country	3/2
Workforce Development	D.4.1 Human resources are available to implement IHR core capacity requirements	1
	D.4.2 Applied Epidemiology Training Program or other applied epidemiology training program in place	3
	D.4.3 Workforce strategy	2
Preparedness	R.1.1 Multi-hazard National Public Health Emergency Preparedness and Response Plan is developed and implemented	1
	R.1.2 Priority public health risks and resources are mapped and utilized.	2

Biosecurity is vital (yet under-represented)

Biosecurity Capability

Global annual biosecurity budget: ~\$300 million; U.S. pays at least 2/3.

U.S. biosecurity budget is being slashed.

Stopping outbreaks at the source costs less.

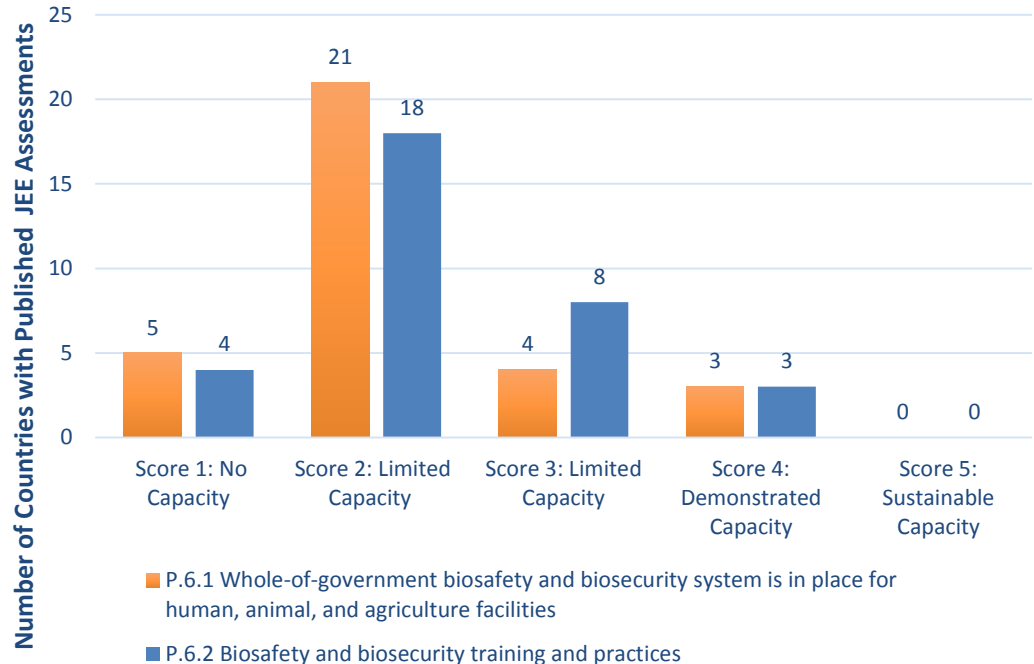
Pathogens are more accessible; can be created & modified.

No dedicated Global Biosecurity Dialogue to build commitments.

What we know...

- 33 countries have published a JEE
- Only 3 of those countries scored above a “3” for the JEE biosecurity & biosafety indicators
- 22 countries scored a “2” or below for the biosafety & biosecurity indicators

Performance on JEE Biosafety & Biosecurity Indicators



And....dual use oversight is not really included..

No global consensus
exists among
innovators or
governments on
norms, incentives, OR
metrics for assessing
and addressing risks
posed by advances in
technology.



What has been done: Select U.S. Policy Milestones

- 1975 Asilomar Conference on Recombinant DNA
- 2004 National Academies of Science Study known as the “Fink Report”
- 2004 decision to create the National Science Advisory Board on Biosecurity
- 2012 deliberation on publication of H5N1 research by Fouchier and Kawaoka
- 2012 and 2014 policies on Dual Use Research of Concern; list-based
- 2014 decision to pause certain types of federally-funded gain-of-function research
- 2017 Policy Guidance for Potential Pandemic Pathogen Care and Oversight (P3CO)

However...there are no national or global frameworks or review structures to discuss or mitigate the national security risks posed by emerging biotechnologies and their applications...

...as they emerge and are being considered for publication...

....Should there be?

What more could be done on a global-scale?

Collective risk assessment

Collective mitigation strategies

Investment in innovation

Global norms, global governance

Leadership from innovators...Required



A photograph of a winding asphalt road at sunset or sunrise. The sky and landscape are bathed in a warm, orange-gold light. A single car is visible in the distance, driving away from the viewer. The road curves to the right and then back to the left. The overall mood is contemplative and hopeful.

Where do we go from
here?

...and who is we?

Next Steps: Global Leadership

Norms

Could a global group agree on international norms?

Adoption

How would they be adopted?
Who would arbitrate thorny issues?

Governance?

Could the global community assess risks as they emerge?
Provocative idea: Is a Global Council of innovators feasible?

Educate...Innovate


The background of the slide is a close-up photograph of a spider on its web. The spider is positioned in the center, with its legs spread out. The web is a complex, spiral structure made of fine, white threads. The background is a soft, out-of-focus green, suggesting a natural environment.

Threat Awareness

Threat awareness toolkit for SynBio community?
Tabletop Exercises?

Grand Challenges

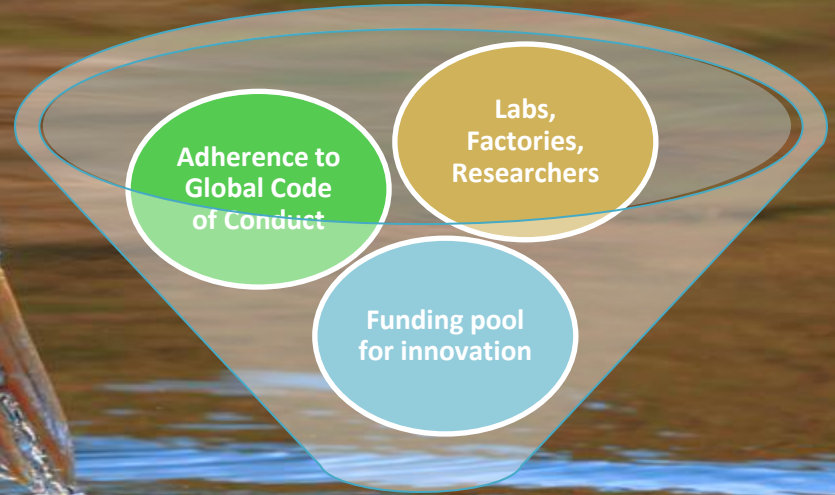
More “built-in” risk mitigation approaches?
Global Biosecurity Corps?



Educate...Innovate

**Could biosecurity also
accelerate innovation?**

...and Incentivize!



Way Ahead



Adoption of new global norms as a prerequisite to participation in significant scientific collaborations (e.g. consortia, gene swaps)

Standard dual use oversight requirements for all pandemic flu centers

New norms from journals, adopted by Committee on Publication Ethics

UN High Level event on global norms for dual use research

Catalytic funding for innovative biosecurity-related technology

Questions?

NTI



BUILDING A SAFER WORLD