

The COVID Crisis: Implications for United States – and Global – Biosecurity.

Prof. James Giordano, PhD

Department of Neurology

Neuroethics Studies Program, and Program in Brain Science and Global Law and Policy Georgetown University Medical Center, Washington, DC, USA

and

Project in Biosecurity, Technology, and Ethics US Naval War College, Newport, RI, USA

Disclaimer

The information and views presented are those of the author, and do not necessarily reflect those of the US Department of Defense, US Naval War College, DARPA or the organizations and institutions that have provided support for this work.

COVID-19

<u>NOT a bioweapon</u>

Yet...

- Clear and present threat to biosecurity
- Multi-dimensional, interactively DISRUPTIVE effects
 - Biological
 - Psychological
 - Socio-economic
 - Political





Demonstration of Biosecurity Vulnerability

Preparedness Process

- Infrastructure and Coordinated Response Functions
- Surveillance
- Quantification
- Readiness: Review, Revision
- 2010 NATO Moldova Model
- Crimson Contagion Exercise
- 2019 Report to Senate Intelligence Committee

See: DeFranco JP, Giordano J. The dark side of delivery; The growing threat of bioweapon dissemination by drones. DefencelQ 13(1): (2020).

Giordano J, Snow JJ, DeFranco JP. Weaponized prions: Much ado about nothing, or big concerns about little proteins? *DefencelQ*, 12(42): (2019). Giordano J. Weaponizing the brain: Neuroscience advancements spark debate. Nat Def, 6: 17-19 (2017).

Surveillance: Intra-national

- Self-reporting
- Systematic reporting
- Combinatory approach(es)
- Position and activity 'mapping'



<u>Techniques and Technologies</u> Personal communication tagging (e.g.- iPhone apps) Immunity 'passports'/chips EMR access "Protective Panopticon?"

Surveillance: Inter-national

- Literature Tracking
 - Self-reporting
 - Systematic reporting
 - Comparative analyses
- Activity Tracking
 - Explicit
 - Implicit
 - Effectual ('Cui bono? Cui malo?)
- Talent-position and -movement 'mapping'
 - Overt
 - Tacit
 - "Strings"





Data Acquisition and Tracking

- Across domains
 - Cellular-to-social
- Across levels
 - Individual, cohorts, groups, populations
- Across geographic locales
 - Complete geo-spatial access
- Across time
 - Individual and historical timespans
- Across groups
 - Comparatively and normatively

1: Appropriate analyses 5: Understand detailed patient-level data in context	2: Platfo host stand and integ tool: 6: Person Medici	3: Preventa and persona health intervention	I: Relating the individual to he population	Đ	22: Collect health information from the point of care 26: Text/Data Analytics for Clinical Decision Support	f f a or port	23: Generating hypotheses from databases 27: Discovery of composite biomarkers 31: UX 35: events to		24: make hea service use d widely availa 28: Monitori compliance v best practic 32: Anonymisati	Ith 25: Combining Data Data Repositories 1g 29: Variety 1th 33: Enhancing predictive healthcare		59: structured info common to health and social care 60: Learning from data		
7: Learning healthcare system 8: Rapid feedback learning health system 9: Better evidence-based decision-making 10: Closing the ap between		13: Re cr medic 15: P Inf 17: In data 19: S Medic on Ima	porting on urrent cation use Predictive erence ategrating sources Stratified cine based Clinical ige Data	14: E sequenc: minin languag 16: Pre mod Leat Healt Sysi 18: Deve of Disea Pred Alroo	14: Event ence/process nining via uage models Predictive nodels in Learning ealthcare Systems Development seases Risk rediction laorithms		30: Data Scier for Mental Health 34: Use of G patients recor to improve healthcare	P rds	data te informatic knowled	on & ge	and Record Linkage 36: GDS- inspired, Digital-by- Default IT Transformati	g 37: Opportunis detection disease fro images	tic nf m	61: Strategic analysis of research
evidence and action 11: Automated interventions 12: Personalised Healthcare	BLUE	21: System data		20: integratio	20: Data itegration/wrang- ing		38: Geospati data mashups heterogeneou sources	al of us	ıl 39: Weather & of Pollution Datal ^F orecasts in Health Care		40: Use of genetic information	ORAN 41: Critical realism PURP	I <mark>ge</mark> Ple	62: robust holistic assessment of healthcare system
42: Smartphone apps to improve outcome assessment 49: Exercise and glycemic control in type 1 diabetes	43: Deep tissue imaging 50: Theory of overfitting in survival analysis		44: Analysis of Use On-line Behaviour 51: Combating Healthcare Associated Infections (HCAIs)		: Monitoring an improve nagement of relapse	46: mc CO	Continuous onitoring of IPD patients	47: dise pers cl cor	47: Second diseases in persons with chronic conditions		ssist gait nab of ological ditions	56: Bristol Population Laboratory (BPL) 57: Supporting managed self- care in chronic conditions 58: Biomedical		
52: Patient safety improvement	53: Patient safety		54: Understanding patient journey's through the NHS		5: Drug Adverse vents Detection using Data Mining						PINK	data integration	SILVER	GYAN

Individual Data



Group-analytic Data



The "Black Box" approach



Caveats

- If it's assessable, it's accessible
- If it's tagged, it's targetable
- If it's stackable, it's hackable
- What's hackable is manipulable
- What's controllable is corruptible



Issues...Tensions...Conflicts Dilemata

Prevention

• Privacy

- Protection
- Public Health

- Personal Liberties/Rights
- Potentially Punitive Implications



Strategic Envisioning – and Engagement

Vista of:

- <u>Probability</u>: Present to 5 years "What exists now, and 'soon'..."
- <u>Possibility:</u> 5 to 10 years

"Given probabilities, what might occur..."

Potentiality: 10 to 25/30 years

"Given possibilities, what could be done with them ... "



Core Questions and Issues

- What do we do with the information and capability we have?
- What do we do *about* the information and capability we don't?
- Given what *can* be done, how do we (and who will) decide upon what *should* be done?
- Will be able to do what we decide we should?

Four Thrust Strategy



Whole of Nation approach required to identify, characterize, counter, and exploit/prevent biosecurity risks and threats to United States' public health and socio-economic stability



Key Steps

Core premise: Civic Institutions May Not Be Ready ...

- Need for Medical Information Non-discrimination Act (MINA; pro GINA)
- Need for programmatic biocyber-security
- Need for ongoing "surveillance of surveillance"
- Need for discourse/dialog
- Need for communication
- Need for cooperation

(Intra-nationally; Inter-nationally – inclusive of "Cooperative Competition" Models)

Summary

Diosecurity risks/threats are increasing: clear and present danger to U.S. national security and stability

Establish PMO/POR <u>now</u>

- Fund research in technologies, innovations, countermeasures, and solutions
- Develop capabilities to address and defeat evolving biosecurity (natural, kinetic and non-kinetic) threats (i.e.- Strategic Plan and tactical flexibilities)
- Remain ahead of competitors'/adversaries' abilities to exploit US weaknesses
- Engage Whole of Nation approach leveraging all sectors of national power

Additional Information

- DiEuliis D, Emanuel P, Giordano J, Titus A. Applying advanced technologies to fight pandemics. *Nat Def* (2020); available online at: https://www.nationaldefensemagazine.org/articles/2020/5/15/apply-advanced-technologies-to-fight-pandemics
- DiEuliis D, Emanuel P, Titus A, Giordano J. Beyond 1919: Bringing pandemic response into the present and future. INSS Bulletin 5(1) (2020)
- Gerstein D, Giordano J. Biosecurity is the lesson we need to learn from the COVID pandemic. *National Interest*, (2020); available online at: https://nationalinterest.org/tag/biosecurity
- Snow JJ, Giordano J. Aerosolized nanobots: Parsing fact from fiction for health security a dialectical view. *Health Security* 17(1): 74-76 (2019).
- DiEuliis D, Lutes CD, Giordano J. Biodata risks and synthetic biology: A critical juncture. *J Bioterrorism Biodef* 9(1): 2-14 (2018).
- Snow JJ, Giordano J. Public safety and national security implications of the horsepox study. *Health Security* 16(2): 1-3 (2018).
- DiEuliis D, Giordano J. Gene editing using CRISPR/Cas9: implications for dual-use and biosecurity. *Protein and Cell* 15: 1-2 (2017).
- DiEuliis D, Giordano J. Why gene editors like CRISPR/Cas may be a game-changer for neuroweapons. *Health Security* 15(3): 296-302 (2017).
- Giordano J. Battlescape brain: Engaging neuroscience in defense operations. *HDIAC Journal* 3:4: 13-16 (2017).
- Palchik G, Chen C, Giordano J. Monkey business? Development, influence and ethics of potentially dual-use brain science on the world stage. *Neuroethics*, 10:1-4 (2017).
- Tennison M, Giordano J, Moreno J. Security threats vs aggregated truths: Ethical issues in the use of neuroscience and neurotechnology for national security. In: Illes J, Hossein J. (eds.) *Neuroethics: Defining the Issues in Theory, Practice and Policy.* Oxford, Oxford university Press, 2017.
- Giordano J. The neuroweapons threat. Bull Atomic Sci 72(3): 1-4 (2016).
- Giordano J, Forsythe C, Olds J. Neuroscience, neurotechnology and national security: The need for preparedness and an ethics of responsible action. *AJOB-Neuroscience* 1(2): 1-3 (2010).

Contact

Prof. James Giordano PhD james.giordano@georgetown.edu

