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Advances in Medical Countermeasures and Lessons from
'Main Stream Medicine'

Colonel David Bates ARRC MPH FRSPH*

Institute of Health



Thursday 25th May 2023
Rotterdam

NCT Europe 2023
Defence technology



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The Ecological Approach to Developing CBRN Defence



History

- the 'silver bullet'
- Medcm are not stand alone/fire and forget
- Learning over the last two decades

Recent and Current Threats

- Corona viruses
- Filo viruses
- Novichocks
- NPPs
- All Hazards approach

Advances in Medcm development

- Vaccines technology
- Requirements – civ mil
- *In silico* down selection
- Manage end to end product development
- WHO's R&D Blueprint

Human Security

- environmental animal human – ecological approach to PH – FHP
- Multi professional/disciplinary/agency response

Situational Awareness – Common Operating Picture

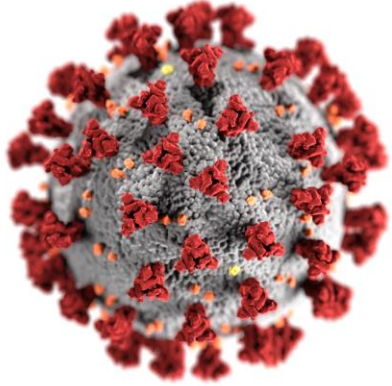
- Medical intelligence
- Indicators and warnings
- Prevention – ecological approach to PH – FHP
- Windows of Opportunity



Challenges

Diagnostics/vaccines/small molecule toxicology

Enter Agent X



2014 – 16 EVD had waned before medcm were available (Simpson et al, 2017)

Per or post epidemic / pandemic medcm development aligning stakeholders/actors/audiences and countering adversaries

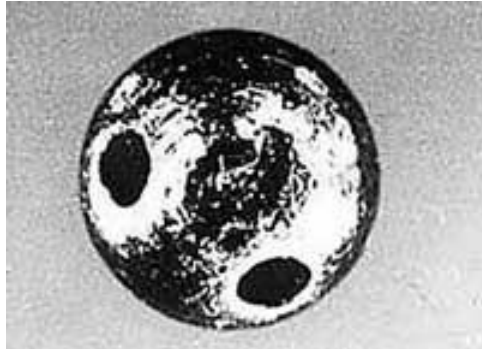
Recommendation to focus on:

- Finite resources available in CBRN preparedness
- Barriers across: research, clinical trials, manufacturing at scale
- Investments made to accelerate availability of medcm
- Smart or intelligent standards and quality requirements to facilitate developers ie regulatory procedures

Timeline and Lessons



Spanish Flu 1918



1978 Georgi Markov



Ebola 1970s to date



Avoid Future Shocks through Mitigation and Preparation

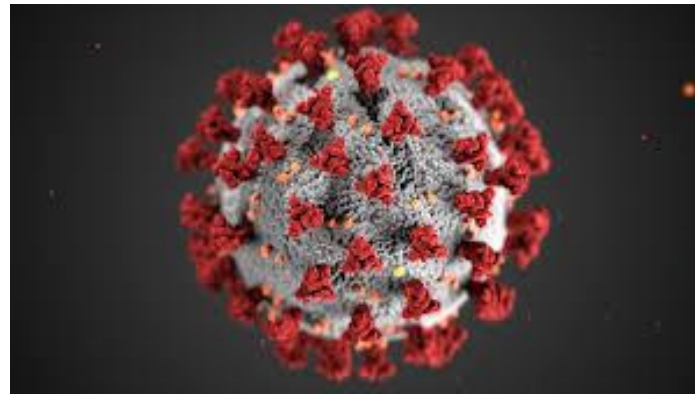


November 2006



March 2018

Global health is only as strong as the weakest partner



December 2019 to date



Ongoing

Lessons in Summary



Technological Opportunities for R&D Acceleration

- Rapid antibody development platforms for prophylaxis and therapeutic candidates
- License these platforms for known pathogens with commercial potential
- Design to include 'plug and play' using recombinant vectors and nucleic acid
- 'Gene Cassettes' for an antigen of choice
- Sharing access to biological materials (Secretariat of the Convention on Biological Diversity Montreal, 2014).

Developing Therapeutics Across Modalities

- Not quite the 'silver bullet'
- Broad and narrow spectrum targeting pathogen families
- Identify immune modulating compounds and other modalities to form libraries

Similarly Diagnostics

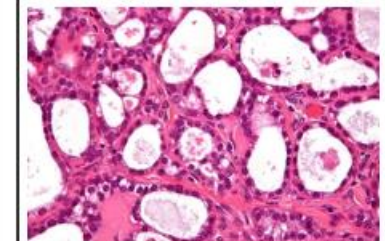
- Plug and Play as we have already mentioned



New test rapidly diagnoses Zika



Quick test for Ebola



New technology can detect tiny ovarian tumors

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