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

**Colonel David Bates ARRC MPH FRSPH\***

**Institute of Health**



Thursday 25<sup>th</sup> 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

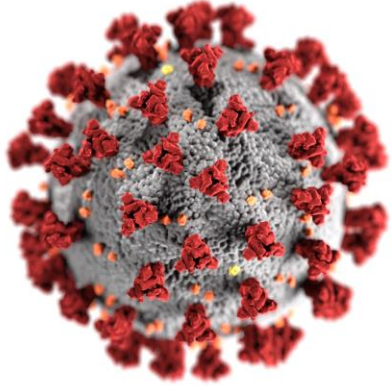
- Medical intelligence
- Indicators and warnings
- Prevention – ecological approach to PH – FHP
- Windows of Opportunity



## 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**

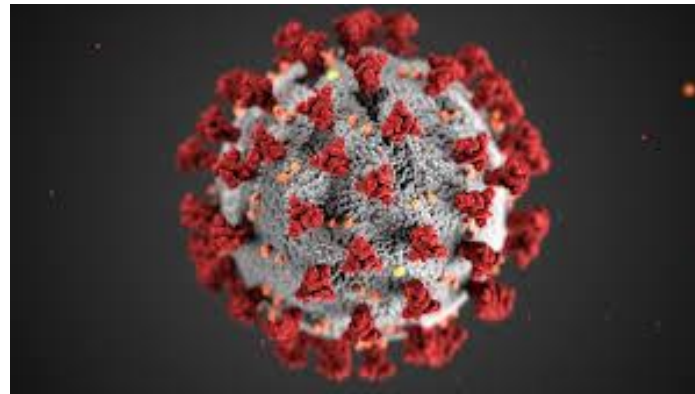


November 2006



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

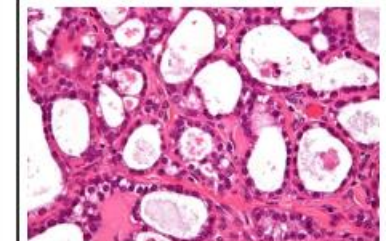
- Plug and Play as we have already mentioned



New test rapidly diagnoses Zika



Quick test for Ebola



New technology can detect tiny ovarian tumors

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