Using Artificial Intelligence to Strengthen Global Epidemic Surveillance
BWC Side Event, UN Office at Geneva, Dec 4, 2018

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Emerging Global Threats

• Naturally occurring outbreaks involving dangerous pathogens are increasing in frequency and scale.

• Technologies that could be used by non-state actors to weaponize these pathogens are increasingly accessible.

• Global situational awareness of high-risk infectious disease threats is essential.
It’s not information overload. It’s filter failure.

Clay Shirky  
NYU Professor
Big data, artificial intelligence, and digital technologies create new opportunities to become faster, smarter, and better coordinated.
Three Way Partnership

- Interpol
- Global Affairs Canada
- BlueDot
Track Global Threats in Real-Time

- WHO-OIE-FAO
- ProMED Mail
- Google News

Pathogen
Location - Time
Contextual Factors

UNSTRUCTURED TEXT DATA

NLP ML

20,000+ sources
65 languages

>90%

DEDUPLICATION AND ELIMINATION OF LOW RELEVANCE DATA

HIGHLY STRUCTURED DATA
Contextualize Each Threat

- Real-time global infectious disease events
- Pathogens of security significance
  - Naturally occurring?
  - Deliberate event?
  - Prevent acquisition of microbiological materials
  - Prevent future bioterrorism acts
  - Mitigate impacts through timely response
- Epidermic Events of Security Significance
- Naturally Occurring Geographic Range
- Seasonality of Transmission
- Real-Time Meteorological Conditions
- Conflict Zones
- Political Instability

Aberration Detection
Risk Assessment
Pneumonic Plague Activity in Madagascar

Plague deaths climb to over 200 in Madagascar

Brief
An outbreak of plague has been occurring since August 1, 2017. The Health Ministry issued an alert stating that most of the deaths have been in the middle of the country, Madagascar's most populated area. Case fatality rate to date...

Reasons for event
Risk of international dissemination, increased disease activity relative to historical norm, high media-buzz

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Opportunities

• Harness the power of big data, artificial intelligence, and digital technologies for enhanced global situational awareness of biological threats

• Build capacity by engaging in cross-sectoral partnerships across health and medical sciences, big data analytics, digital technologies, and government policy

• Three-way collaboration with Global Affairs Canada, Interpol and BlueDot in 2019 to assess opportunities at the health-security-law enforcement interface
Thank You

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