BIOD 751: Biosurveillance

Professor: Dr. Andy Kilianski, PhD

Provides an understanding of the capabilities required to provide reliable early warning of disease outbreaks and identify their etiological agents. Assesses strengths and limitations of physicians, laboratories, epidemiologists, aerosol sensors, and syndromic surveillance systems. Considers challenges posed by the integration and analysis of the information collected by these sources.

Textbook – *Concepts and Methods in Infectious Disease Surveillance* (Wiley) - Nkuchia M. M’ikanatha (Editor), John Iskander (Editor)

SYLLABUS

WEEK 1-8: Biosurveillance TTX

WEEK 8-16: Extra credit field trip to biosurveillance location

WEEK 1: Introduction
- What is biosurveillance?
- Who does biosurveillance?
- Why is biosurveillance important?
- Class information

WEEK 2: Biosurveillance as a concept (International)
- GHSA
- WHO/OIE
- UN/NATO

(Chan et al. 2010; Hartley et al. 2010; Moudy et al.; Stoto)

WEEK 3: Biosurveillance as a concept (USG)
- National Strategies:
- National Strategy for Biosurveillance
- NATIONAL BIOSURVEILLANCE SCIENCE AND TECHNOLOGY ROADMAP
- Current paradigms:
- Who does it in US?
- Who is in charge?

WEEK 4: Biosurveillance as a concept (Local)
How does a local entity think about biosurveillance

http://www.naccho.org/advocacy/positions/upload/06-02-Biosurveillance.pdf
WEEK 5: Operational biosurveillance (International)
-Animal biosurveillance
-Zoonotic biosurveillance
-Human biosurveillance
-Integrated biosurveillance

(WEEK 6: Operational biosurveillance (USG)
Examples from each biosurveillance organization:
-CDC:
2009 H1N1
-DoD:
Ebola, biodefense
-DHS:
NBIC/NBIS, biowatch
-EPA:
Biowatch, Air+Water monitoring
-FDA:
Ebola EUAs
-USDA:
Current avian influenza

WEEK 7: Operational biosurveillance (Local)
-Boots on ground, sampling, interviews, etc.

(WEEK 8: Integrated biosurveillance
-How does everything we've talked about work?

GAO NBIC report

WEEK 9: Technology's role in biosurveillance (1)
-Detecting and sensing
-Traditional techniques – PCR, immunoassay, culture
-Emerging technologies – assay multiplexing, NGS

WEEK 10: Technology's role in biosurveillance (2)
-Mapping and electronic data streams for collection and dissemination

(WEEK 11: Predictive epidemiology and biosurveillance (1)
-Projecting the present

(Chretien, Gaydos, et al. 2014; Chretien, George, et al. 2014; Rainisch et al. 2015; Riley et al. 2013, 2015; Russell et al. 2014)

WEEK 12: Predictive epidemiology and biosurveillance (2)
-Projecting the future

(Alexander et al. 2015; Chan et al. 2013; Gilbert et al. 2014; Perrings et al. 2014)

WEEK 9-12: Invited Lecturer for one class

WEEK 13: Student Presentations

WEEK 14: Student Presentations

WEEK 15: Student Presentations

Week 16: ****RESEARCH PAPER DUE ****

READINGS:


