THE Epidemiologist is THE DETECTIVE

Shoe Leather Epidemiology in the 21st Century

Adapted from Emil and the Detectives, by Erich Kastner

Epidemiologist

Surveillance

Detective

Usual Suspects

Epidemiologist

Interrogation Methods

Detective
Shoe Leather Epidemiology

- Field work
- Who, what, where & how?
- Collection of clues, data, specimens...
Finding Meningococcal Network Contacts

- Outbreak of meningococcal disease in gay men
- Sexual, social & drug-sharing contacts
- iTracing
  - Messages to “Friends” of cases
  - Hook-up apps
  - Banner ads: vaccinate

Ongoing Meningococcal Community transmission?

Serogroup C Meningococcal Disease Outbreak in Gay Men, NYC 2010-13

Vaccine Campaign Initiated

Outbreak return?

15-month interval without a case

Finding Meningococcal Network Contacts

- Phone/Apps
- Call logs
- Contacts: multiple, long calls
- SAS match

Analyzing Reportable Disease Surveillance Data

1. Historical Limits Method-modifications
   - Use consistent case inclusion criteria
   - Adjust for trends
   - Exclude previous clusters from baseline
   - Account for delays in data receipt

45% reduction in signals (May 20 - August 5, 2013)

Analyzing Reportable Disease Surveillance Data

2. Building Identification Number Analysis

- Unique 7-digit number assigned by City Planning to a specific building
- Auto-populated by database (Maven) Can also use string search or X/Y coordinates
- Nursing homes, long-term care facilities, group homes, shelters...
- Single case of influenza, 2 or more cases of LD (w/in 1 year)

3. SaTScan analysis

- Space-time permutation scan statistic
- Uses a geographic unit (census tract)
- Are there more cases observed than expected (compared to baseline) inside the cluster vs. outside?

Data Mining-Social Media

- Scans text for key words: sick, vomiting, diarrhea, poisoning
- Multiple persons
- Timing

Data Mining-Emergency Department Syndromic Surveillance

- Single Word Analysis
- Limitation of syndromes
- Surveil for that which you don’t know you should be looking for
- Example: visits to receive prophylaxis for Nm exposure
Data Mining-Emergency Department Syndromic Surveillance

Synthetic Cannabinoids

- Aka K2, Spice, Green Giant, Geeked Up, Caution, Smacked, Wicked X, AK-47, or legal marijuana.
- Shredded plants & chemical additives
- How to track?

Search word/ phrases Exclusions
K2, K-2, K-2, K TWO, K-TWO, Marijuana, Spice
K2[D-F], [A-ZK TWO], [A-ZK-2], [A-ZK], TWO WEEK, Hospice, Spicy, Spiky, Spiker, Spikers

Number of synthetic cannabinoid cases detected by syndromic surveillance, January 2014 - April 30th 2015

Data Mining-RHIOs

- Regional Health Information Organizations
- Hospital data sharing
- Public health access for investigations
- Meningococcal, Legionella

ADVANTAGES
- Fast
- No travel involved
- Paperless
- No need to bother hospital ICP

DISADVANTAGES
- Not all hospitals participate
- Limited staff access
- Missing data
- Navigating screens
Thank You

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Photo by W. Eugene Smith, 1948