New York City Mental Health Syndromic Surveillance System

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OUTLINE

• What is syndromic surveillance?
• What kind of data are collected?
• How do we use it to identify suicidal behavior?
• How do we know when we’re seeing more suicidal behavior than usual?
• What have we seen thus far?
• What are we doing about it?
• Where do we go from here?
Who am I?

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What is syndromic surveillance?
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- Public health surveillance using real-time data for early detection of outbreaks
- Built to identify bioterrorist events in response to World Trade Center attacks
What is syndromic surveillance?

- Doesn’t rely on a formal diagnosis, facilitating a rapid response
- Surveillance at emergency departments based on visit information entered electronically by hospital staff
What kind of data are collected?
What kind of data are collected?

- Data collected from all 53 emergency departments in New York City
- Date of visit, time of visit, hospital, chief complaint, disposition, diagnosis (based on ICD), and individual demographics (gender, age, zip code, race)
What kind of data are collected?

- Real time data are collected, meaning data can get messy
- Real time surveillance lets us intervene as necessary
- Using chief complaint data makes this possible
How do we use this system to identify suicidal behavior?
How do we use this system to identify suicidal behavior?

- ED visits are categorized into syndromes using a combination of the visit chief complaint and ICD code
- We developed a syndrome for suicidal behavior including attempt, ideation, and self-injury
Sample chief complaints

[1] “MEDICAL AND PSYCHIATRIC EVALUATION”
[2] “PSYCH EVAL, SUICIDAL”
[7] “NON-COMPLIANT WITH MEDICATION AND PARANOID BEHAVIOR”
[8] “/"URGE TO KILL MYSELF/"”
[9] “F250 SCHIZOAFFECTIVE DISORDER, BIPOLAR TYPE I10 | PSYCHIATRIC EVALUATION”
How do we use this system to identify suicidal behavior?

- Scan chief complaint field for key terms and common spelling variations, as well as ICD codes in diagnosis field
- Testing definition to maximize visits captured while minimizing false positives
How do we know when we’re seeing more visits for suicidal behavior than usual?
How do we know when we’re seeing more visits for suicidal behavior than usual?

- We use SaTScan software to identify clusters of suicidal behavior in space and time.
How do we know when we’re seeing more visits for suicidal behavior than usual?

For space-time scanning, the scanning window is a cylinder, where the circular base is a geographic space encompassing the hospital or zip code of interest, and the height of the cylinder reflects the time

(Gao & Guo, 2013)
How do we know when we’re seeing more visits for suicidal behavior than usual?

- SaTScan reports a recurrence interval which lets us know how unusual that cluster is, based on historical baseline data.
What signals have we seen thus far?
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Location IDs included.: ABC, DEF
Coordinates / radius...: (40.843411 N, 73.911168 W) / 1.94 km
Time frame............: 2018/2/14 to 2018/3/4
Number of cases.......: 107
Expected cases........: 70.89
Observed / expected...: 1.51
Test statistic........: 7.986917
P-value...............: 0.0093
Recurrence interval...: 107 days
What signals have we seen thus far?

- Timing of the cluster
- Duration of the cluster
- Number of cases

Location IDs included: ABC, DEF, GHI
Coordinates / radius: (40.817374 N, 73.924096 W) / 3.00 km
Time frame: 2018/6/6 to 2018/6/14
Number of cases: 194
Expected cases: 139.96
Observed / expected: 1.39
Test statistic: 9.392128
P-value: 0.0026
Recurrence interval: 1.1 years
What are we doing about it?
What are we doing about it?

- Hospital medical record abstraction
- Analyze demographics, psych history and prevalence of risk factors
Where do we go from here?
Where do we go from here?

- Formalize protocol for suicidal behavior investigations
- Build a dashboard for visualizing clusters and historical data
- Ongoing surveillance
Where do we go from here?

- Surveillance informs suicide prevention efforts
Thank you!

- Bureau of Mental Health, Office of Research and Evaluation
- Bureau of Communicable Diseases, Syndromic Surveillance Unit
Thanks!

QUESTIONS?

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