



# New York City Mental Health Syndromic Surveillance System

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Who am I?

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What is syndromic surveillance?

● What is syndromic surveillance?

- 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



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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

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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"

[3] "ANXIETY"

[4] "PSYCH"

[5] "AGGRESSIVE/VIOLENT BEHAVIOR"

[6] "SUICIDAL THOUGHTS"

[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

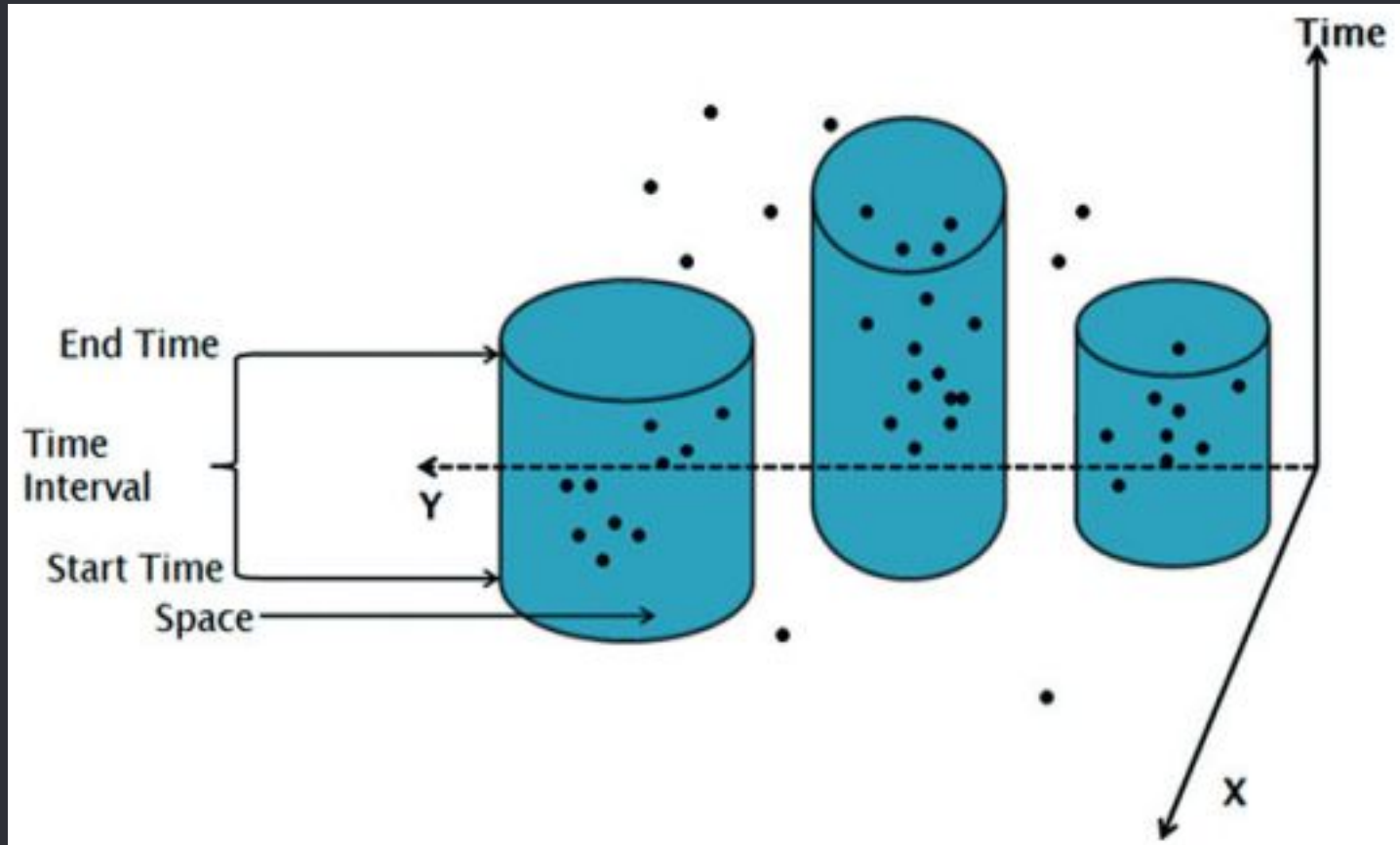
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How do we know when we're seeing more visits for suicidal behavior than usual?

● 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?



(Gao & Guo, 2013)

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



● 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.

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What signals have we seen thus far?

● What signals have we seen thus far?

○ 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
```



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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

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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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