

Syndromic Surveillance for Bioterrorism and Naturally-Occurring Communicable Disease Outbreaks

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Syndromic Surveillance

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- Aberration Detection: Collaboration with University of Washington School of Public Health and Community Medicine, Clinical Informatics Research Group
 - Hospital Emergency Department Discharge Data
 - Primary Care Clinic Discharge Data
 - Emergency Medical Services (911) Calls
 - Medical Examiner - Unexplained Deaths

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- Enhanced Surveillance Activities
 - Consulting Nurse Hotline
 - Year Round Influenza Surveillance

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Data Sources

Clinical Based

Hosp ED
Dx

Primary
Care DX

Year round
Flu Surv.

Nurse
Hotlines

School
Absenteeism

Other

Public Health Based

Unexplained
Deaths

911
Triage Codes

Future Directions

Additional
Clinical Sites

Internet-based
reporting

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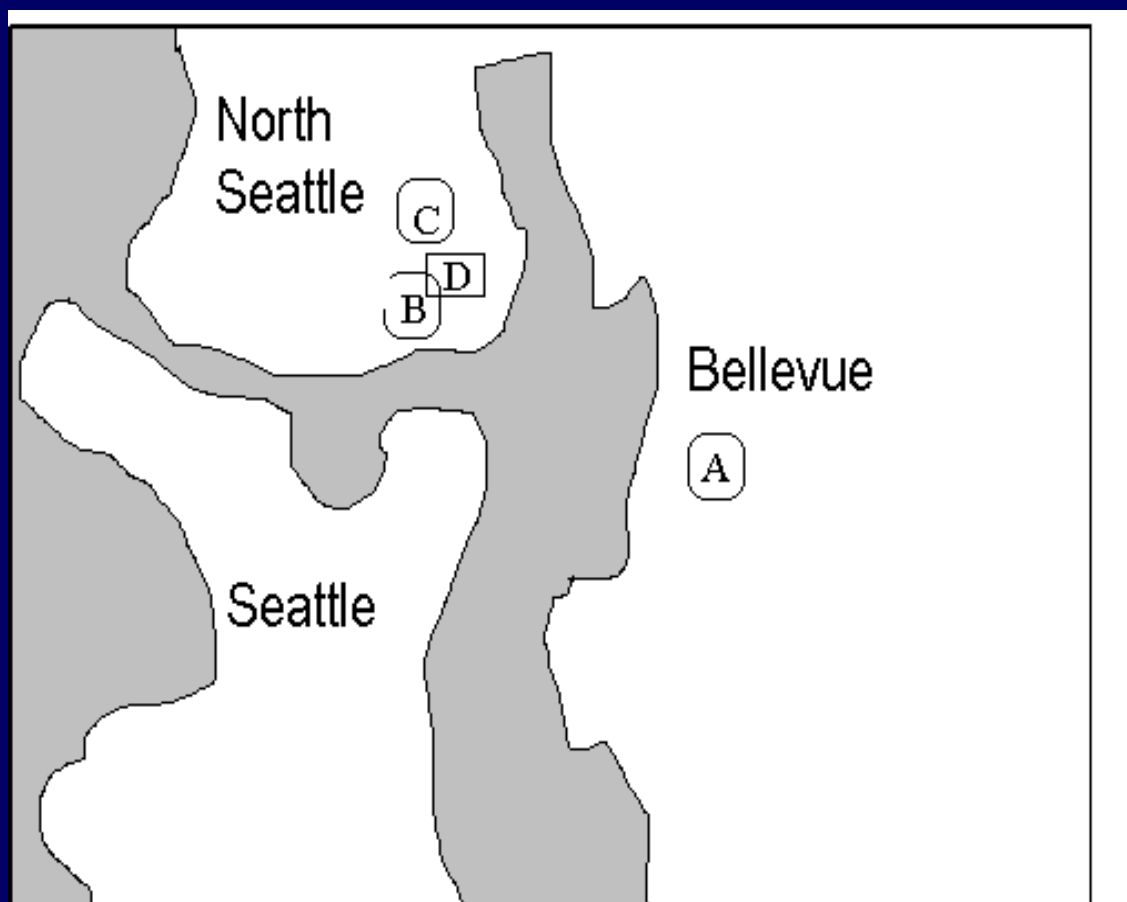
Current Clinical Surveillance Sites

- Emergency department (ED) A: private hospital; 48,000 adult/pediatrics, ED & urgent care (UC) visits/year
- ED B: university hospital; 30,000 adult ED & UC visits/year
- ED C: university-affiliated children's hospital; 28,000 pediatric ED visits/year
- Primary Care Center (PCC) D: University-based student/community health; 10,000 visits/year
- Ten regional primary care clinics

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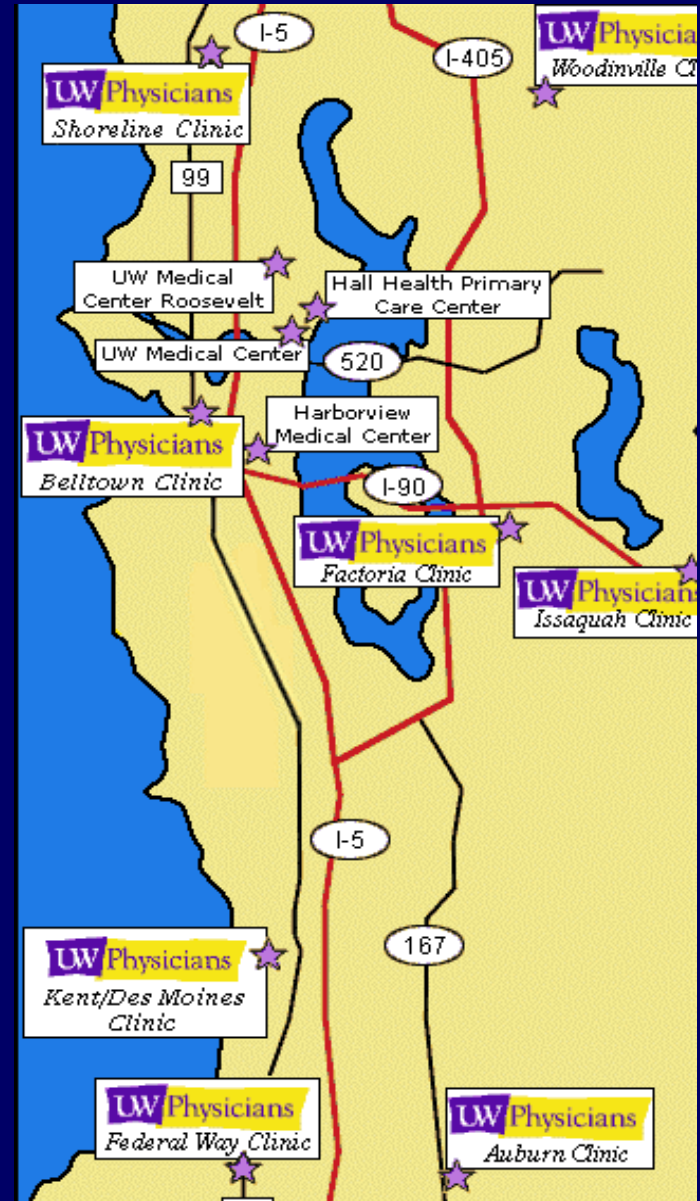
Emergency Department Sites



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Regional Primary Care Network



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Surveillance System Methods

- Data sources - existing clinical data systems
- Secure internet-based data transfer
- Central data repository

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Surveillance Methods

- Data extracted from clinical discharge diagnosis databases at three hospitals and nine primary care clinics
- Transmitted electronically
- Analyzed using CDC aberration detection program

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ED Surveillance Data Collection Methods

- Customized data extraction software
- FoxBase Pro
 - COM object
 - Remote access
- Secure internet-based transmission to central data repository

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Clinical Sites - Data Collection Methods

- Site-specific data extraction software
- Conversion to standardized representation (XML)

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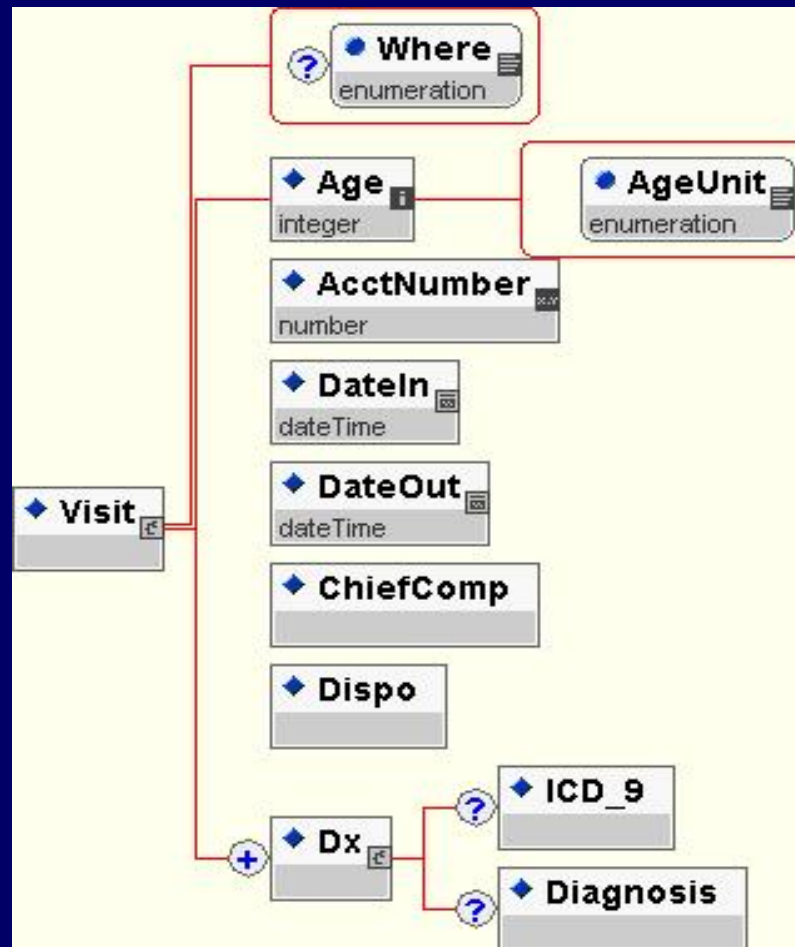
Indicator Codes - Free Text

Diagnosis or Free Text	ICD-9
Viral syndrome-peds	079.9
pneumonia-viral	480.9
Influenza	487.1
Flu	
Enterocolitis	009.0
diarrhea-infectious	009.2
Viral meningitis	047.9
bronchitis	466.0
pneumonia-peds	486
diarrhea-peds	787.91
measles	055.9
Pleurisy	511.0

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Data Collection Methods - XML Schema



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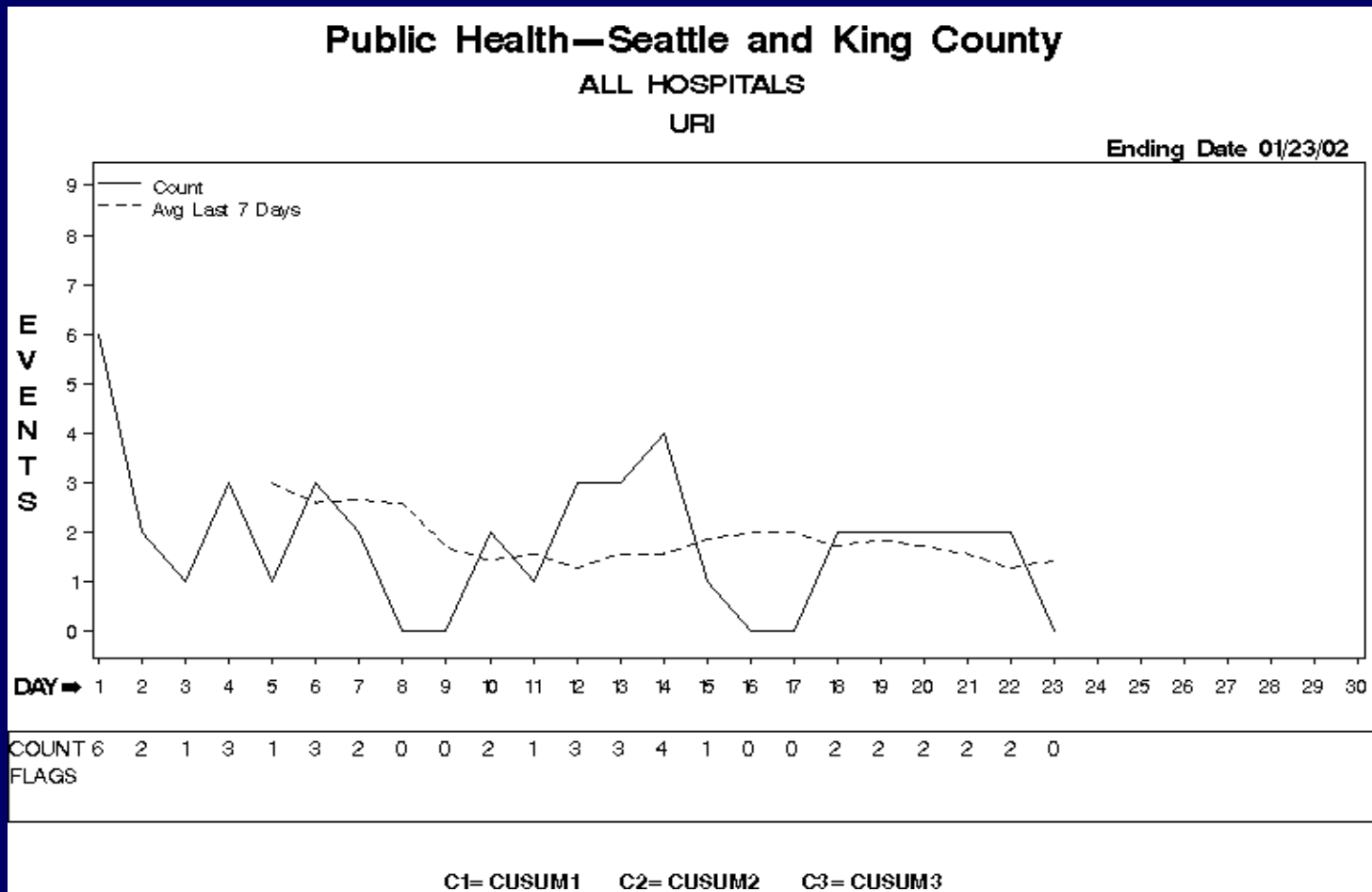
Aberration Detection Programs

- SAS Aberration Detection Programs developed by the CDC for:
 - ED and clinic discharge data
 - EMS (911) data

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Aberration Detection Program



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Medical Examiner (ME) - Unexplained Deaths

- Deaths reported to the King County ME reviewed daily
- Definition: Unexplained death in a previously healthy person aged 1-49 years with hallmarks of infectious disease
- Suspicious cases investigated immediately
- Data is analyzed using aberration detection system developed by Washington DOH which uses death certificate ICD-9 codes to define historic baseline

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Seattle EMS (911) Calls

- The number and type of triage protocols are monitored during each 24 hour period
- Analyze using CDC Aberration Detection Software-CUSUM and Figure 1

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EMS (911) Triage Protocols

- Abdominal Pain
- Breathing Problems
- Convulsions/Seizures
- CVA/Stroke
- Chest Discomfort
- Sick Unknown
- Person Down
- Headache
- DOA
- Dizzy/Fainting

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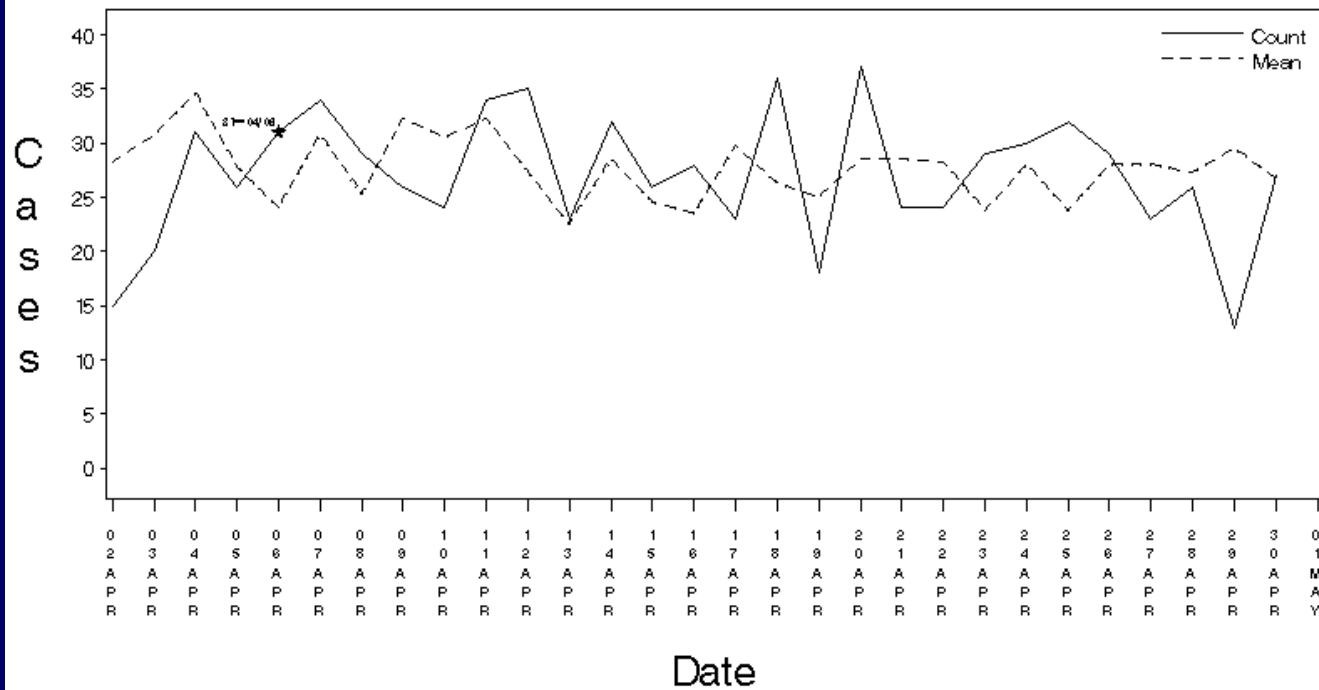
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Aberration Detection Program

Triage: 32 Sick Unknown

Cases Reported in the Past 30 Days

04/02/01 - 05/01/01



■ Historical Limits ★ Cusum ◆ Combined

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Secure Data Transmission

- Automated and manual system data transfer
 - Web page for upload/download
 - Secure authentication
 - Encryption via Secure Sockets Layer (SSL)
 - Secure Web Protocols for flexibility

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Central Data Repository - I

- Microsoft SQL Server 2000
 - ✓ With XML for SQL Web Release
 - ✓ Presently:
 - De-identified data
 - Test database built using initial XML schema

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Central Data Repository - II

✓ Under development

- Improved Security
 - IP restriction, SSL-only, local firewall
- Secure replication to Public Health database system
- Secure access by
 - aberration detection software
 - GIS software
- Improved Protocols

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Future Plans

- Refine Aberration Detection System
- Refine Epidemiologic Response to Triggers
- Add Additional Clinical Sites
- Internet-based reporting for large outbreaks
- Link to Geographic Information System
- Internet-based reporting for outbreaks
- Poison Center Data

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