

Evaluation of Data Collection Systems in New York City Driven by Novel H1N1 Influenza Outbreak Response

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Learning Objectives

1. Describe two data collection methods used by the NYC DOHMH to evaluate emergency department (ED) utilization during the 2009 Novel H1N1 Influenza outbreak.
2. Identify lessons learned from comparing the two NYC data collection methods to improve local data collection for future public health emergencies.

Background, I

- Two existing data collection methods that include New York City hospital information:
 1. Health Emergency Reporting Data System (HERDS)
 2. Syndromic Surveillance (SS)



Background, II

	HERDS	Syndromic Surveillance (SS)
Data Collection	Active	Passive
	Static	Backfill
	Manual and Electronic	Electronic
Historical Data	No	Yes
Established Purpose (pre-H1N1)	Hospital resource data	Citywide surveillance pre-diagnosis/trend data
Reporting Mandates	All NYC Hospitals (n=63) required to self-report via secure website by New York State Department of Health	Voluntary; only for hospitals with emergency departments (n=50/55, 91%, report through SS)
H1N1 Investigation	New survey created for 55 NYC hospitals with ED's	Existing data collection methods continued

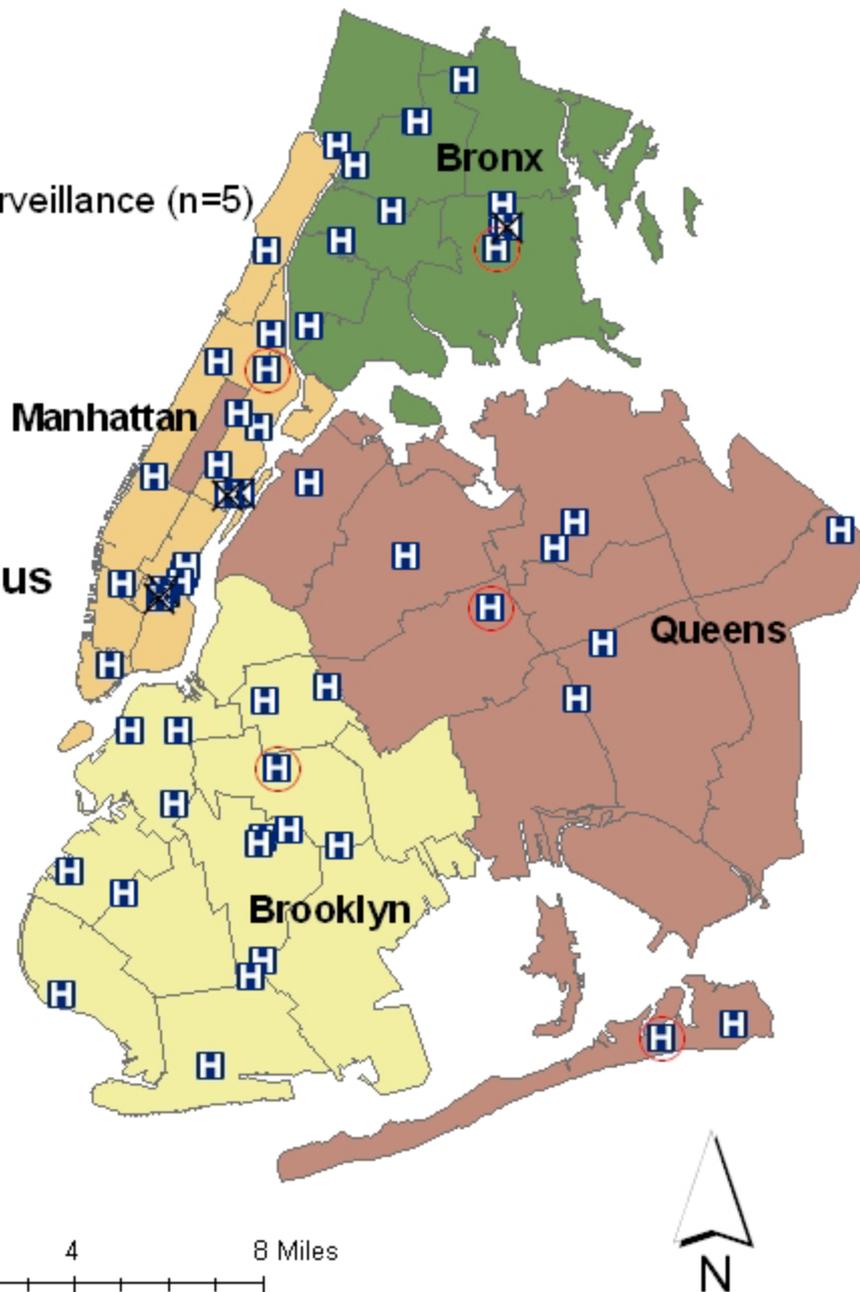
-  New York City Hospital with ED (n=50)
-  Hospital with ED, not captured by Syndromic Surveillance (n=5)
-  Hospital without ED (n=5)

New York City Hospitals (n=60*) by Emergency Department (ED) Status

*60 hospitals, plus 3 children's hospitals
whose data are reported with the "parent" hospital

Borough	# Hospitals with EDs
Bronx	10
Brooklyn	16
Manhattan	16
Queens	10
Staten Island	3

Staten Island



0 2 4 8 Miles

Background, III



- April 25th, 2009: Novel H1N1 Influenza response begins in New York City (NYC)
- Syndromic surveillance continues seasonal influenza monitoring
- First Incident Command (IC) activation, NYS DOH posts a 4-question daily HERDS H1N1 survey
- Second IC activation leads to more detailed HERDS survey development by NYC DOHMH

Background, IV

- Opportunity to compare NYC health-related data collection systems
 - Neither HERDS nor SS assessed for validity previously
 - HERDS could potentially collect information not captured by SS
- Identify strengths and weaknesses
- Recognize utility of collected data
- Discover potential gaps for improvement and where to invest improvement efforts

Methods, I

- Created 20-question HERDS survey
- Aim: to quantify daily emergency department (ED) visits and hospital admissions for adult and pediatric patients with influenza-like illness (ILI) during the previous 24 hours
 - ILI defined as chief complaint of:
 - Fever and cough; or,
 - Fever and sore throat; or,
 - ILI
 - Age groups
 - Adult, ≥ 18 years old
 - Pediatric, < 17 years old (<2 , $2- <18$ years old)



Methods, II

- HERDS survey also asked:
 - Number of persons leaving the ED without being seen; and,
 - Anticipated need for additional staff, supplies, and pharmaceuticals
- HERDS survey administered from 5/21/09 to 6/18/09
 - For dates of visit 5/20/09 to 6/17/09

Methods, III

- HERDS survey daily trend consistency and daily variability was assessed for 4 key variables:
 - Adult ED Visits – Total and ILI
 - Pediatric ED Visits – Total and ILI
- Data graphed to compare ED volume and trends reported through HERDS to SS reported data
- Assessed validity using t-tests

Results, I

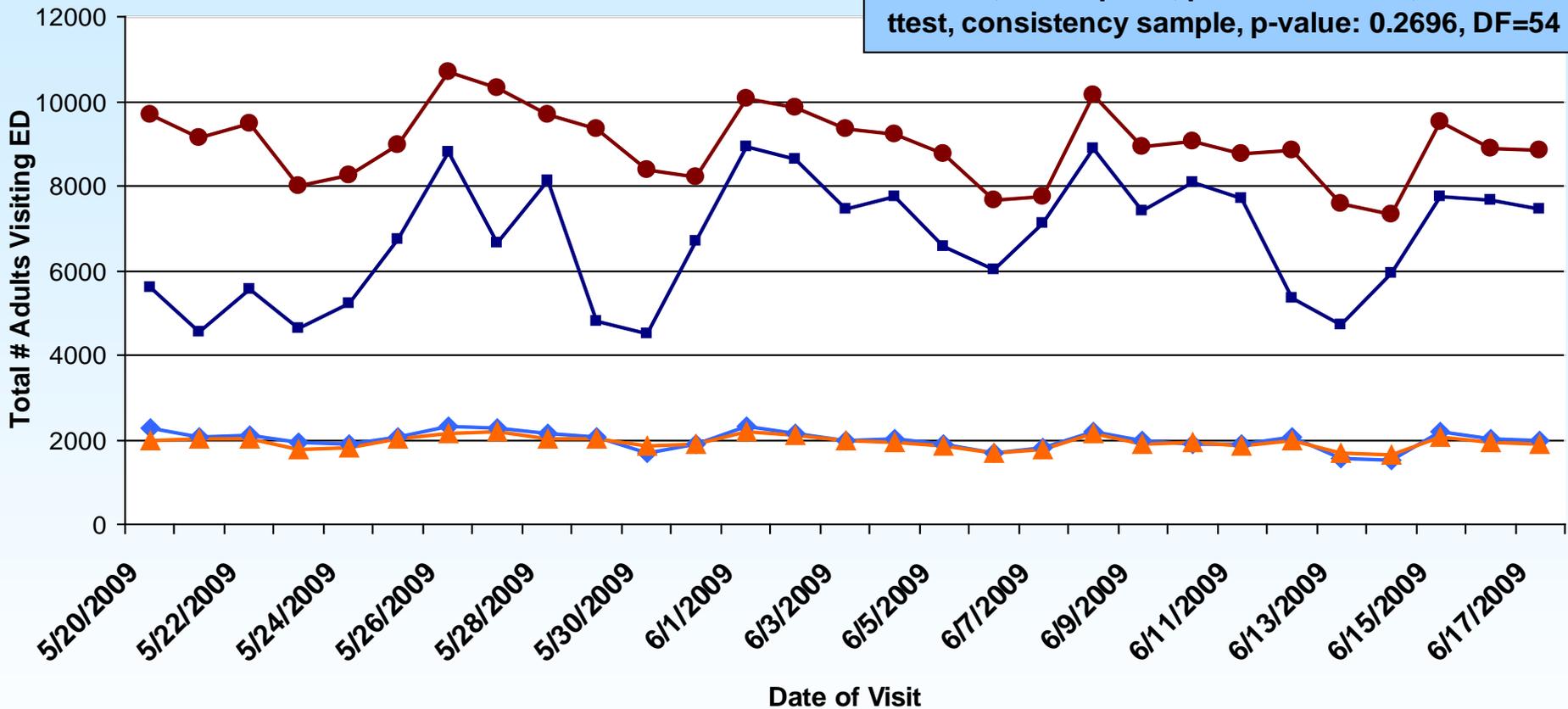
- HERDS daily survey, Mean Hospital Response Rate:
 - n (%): 43 (83%)
 - Range: 29 (56%) – 48 (92%)
- 11/52 (21%) reported all 26 days in HERDS
 - Eleven hospitals then used as “consistency sample”

Borough	# Hospitals Reporting (%)
Bronx	2 (20)
Brooklyn	2 (13)
Manhattan	3 (19)
Queens	2 (20)
Staten Island	2 (67)

Results, II

Total Adult (≥18 years old) Emergency Department Visits New York City, 5/20/09-6/17/09

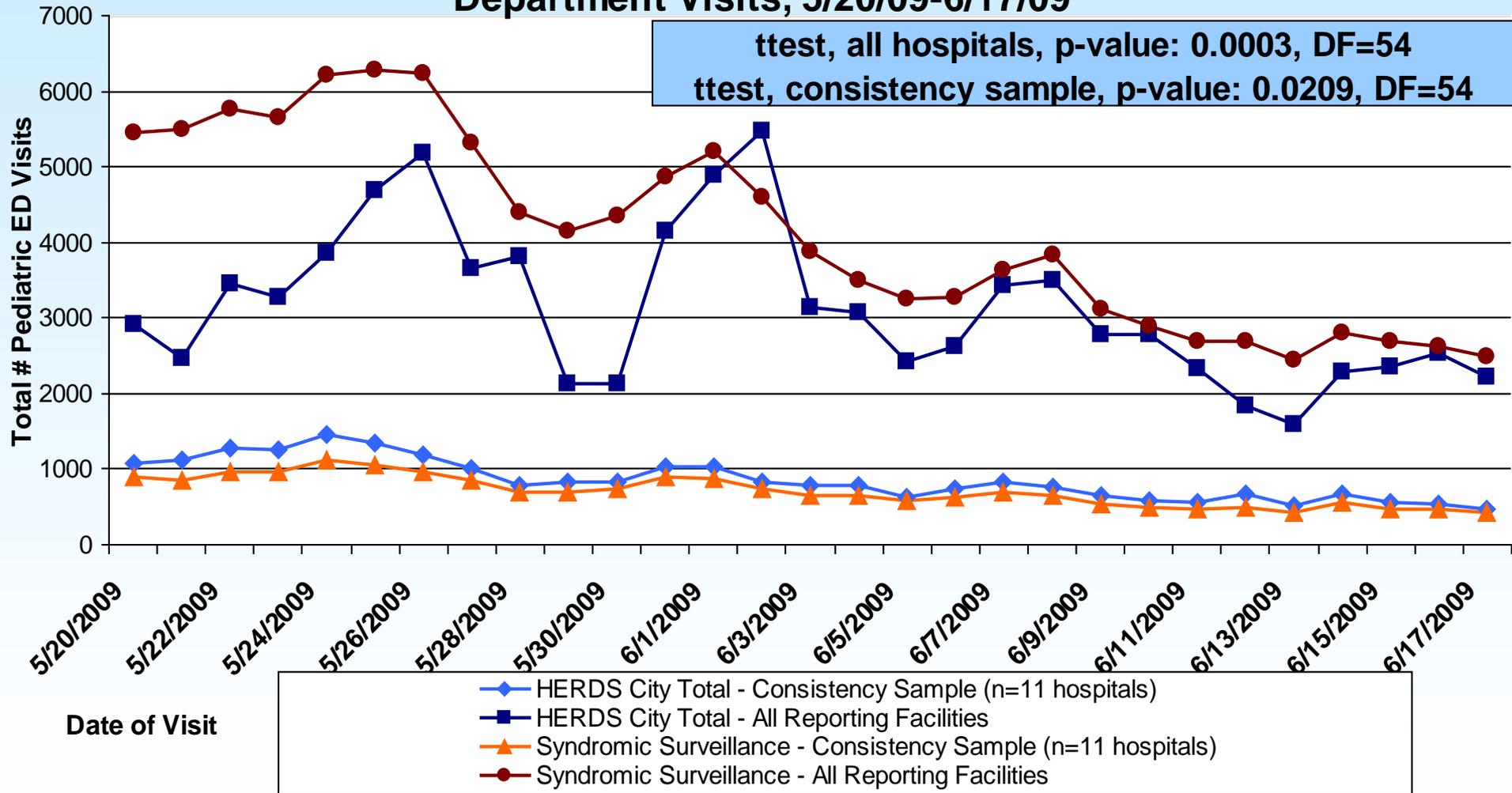
ttest, all hospitals, p-value: <0.0001, DF=54
 ttest, consistency sample, p-value: 0.2696, DF=54



◆ HERDS City Total - Consistency Sample (n=11 hospitals) ■ HERDS City Total - All Reporting Facilities
 ▲ Syndromic Surveillance - Consistency Sample (n=11 hospitals) ● Syndromic Surveillance - All Reporting Facilities

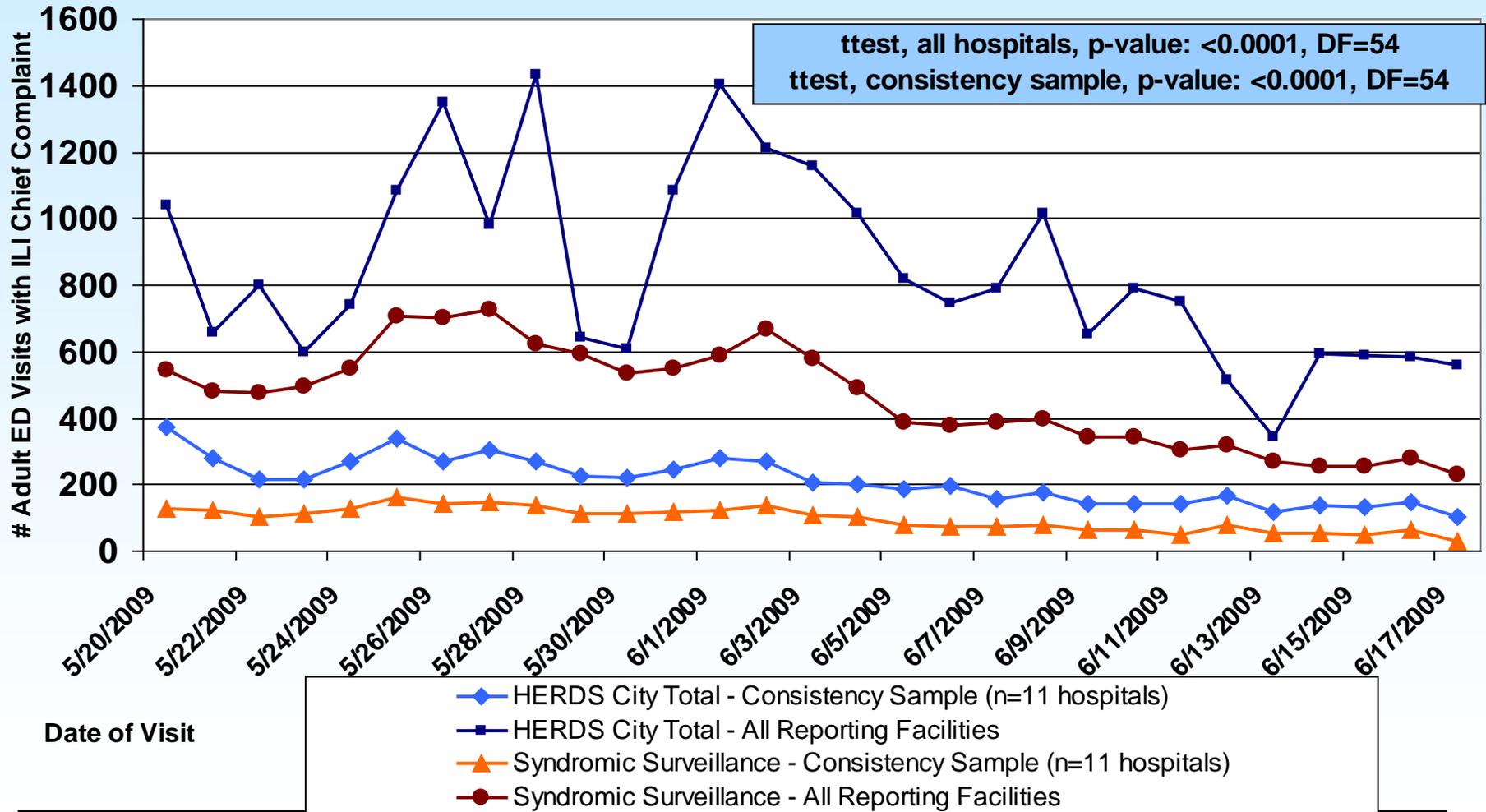
Results, III

Total New York City Hospital Pediatric (<18 years old) Emergency Department Visits, 5/20/09-6/17/09



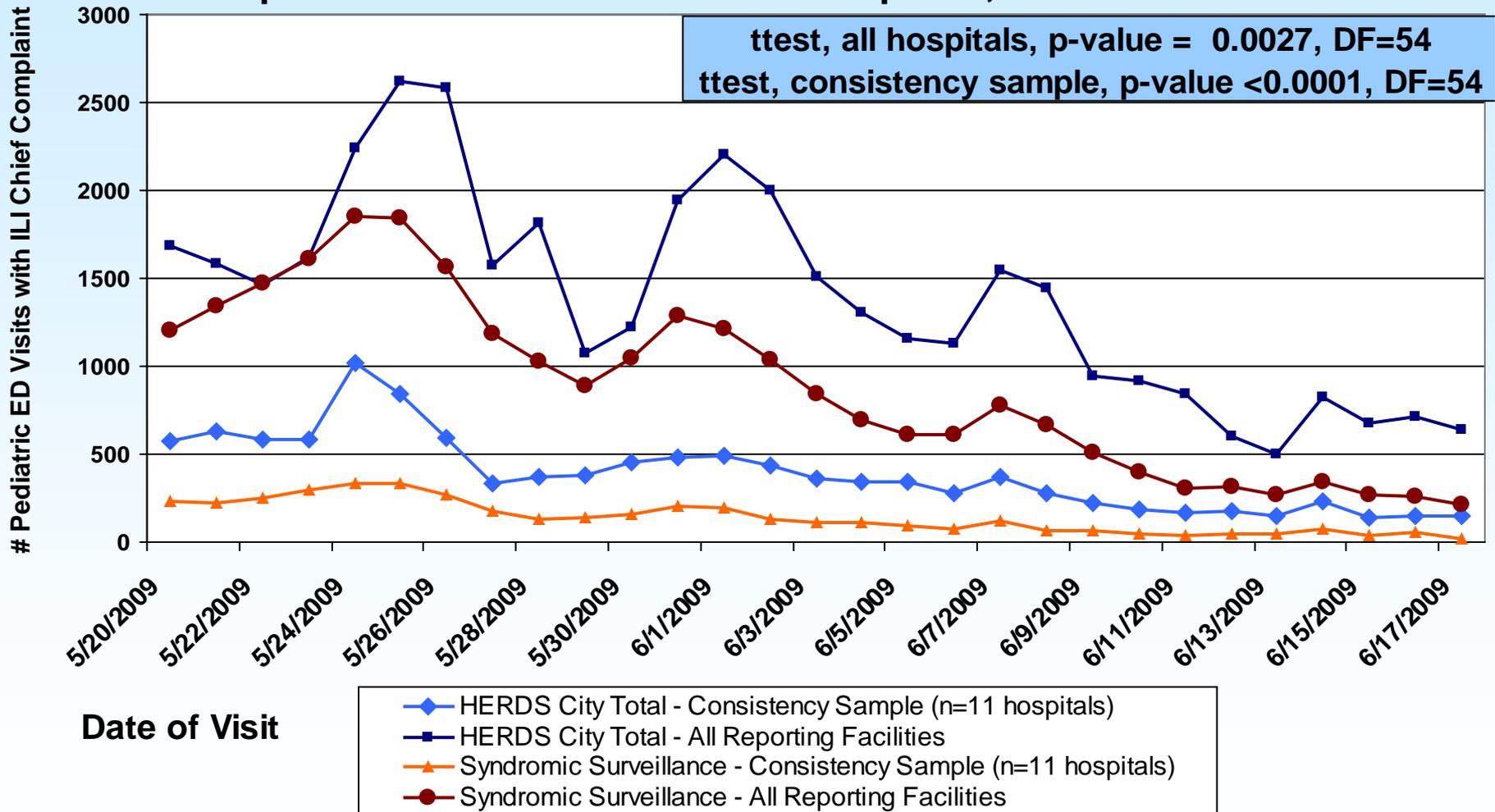
Results, IV

Total New York City Adult (≥ 18 years old) Emergency Department Visits with ILI Complaint 5/20/09 - 6/17/09



Results, V

Total New York City Pediatric (<18 years old) Emergency Department Visits with ILI Chief Complaint, 5/20/09-6/17/09



Conclusion, I

- Consistency sample:
 - Larger statistical differences between HERDS and SS for ILI ED Visits as compared to total ED visit t-test results
 - Future implications:
 - For future H1N1 outbreaks, HERDS may be able to capture ILI ED visits not captured by SS
 - Although initially to gather information about resources, manual hospital-level HERDS data collection may lead to more comprehensive clinical data than SS

Conclusion, II

HERDS

- Strengths
 - Collected information not captured by syndromic surveillance
 - **For example, number of patients leaving the ED, resource needs, manual ED patient registration**
 - Potential to capture data from all hospitals with EDs
- Weaknesses
 - Unclear how hospitals gather data
 - Inconsistent daily reporting
 - Timeliness of reporting

Conclusion, III

- Data Utility during H1N1 Investigation:
 - HERDS:
 - Enabled targeted outreach to NYC hospitals burdened by increased ED patient volume and in need of equipment and supplies
 - Syndromic Surveillance:
 - Reliable baseline and H1N1 Citywide ILI data that monitored NYC activity and detected peak ILI areas

Conclusion, IV



- Inconsistent HERDS daily reporting by NYC hospitals resulted in data that:
 - Differed significantly from SS
 - Compromised validity of data comparability between days
 - Revealed potential underlying quality assurance issues at the hospital-level
- Differences between SS and HERDS data likely were due to different data collection methods at the hospital-level:
 - Manual and electronic for HERDS
 - Electronic for SS

Next Steps

- Qualitative investigation for data quality assurance
 - Understand data collection methods at hospitals reporting in HERDS and SS
 - Will inform data collection in future public health emergencies
 - Potential to create template questionnaires for different public health emergency events

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