

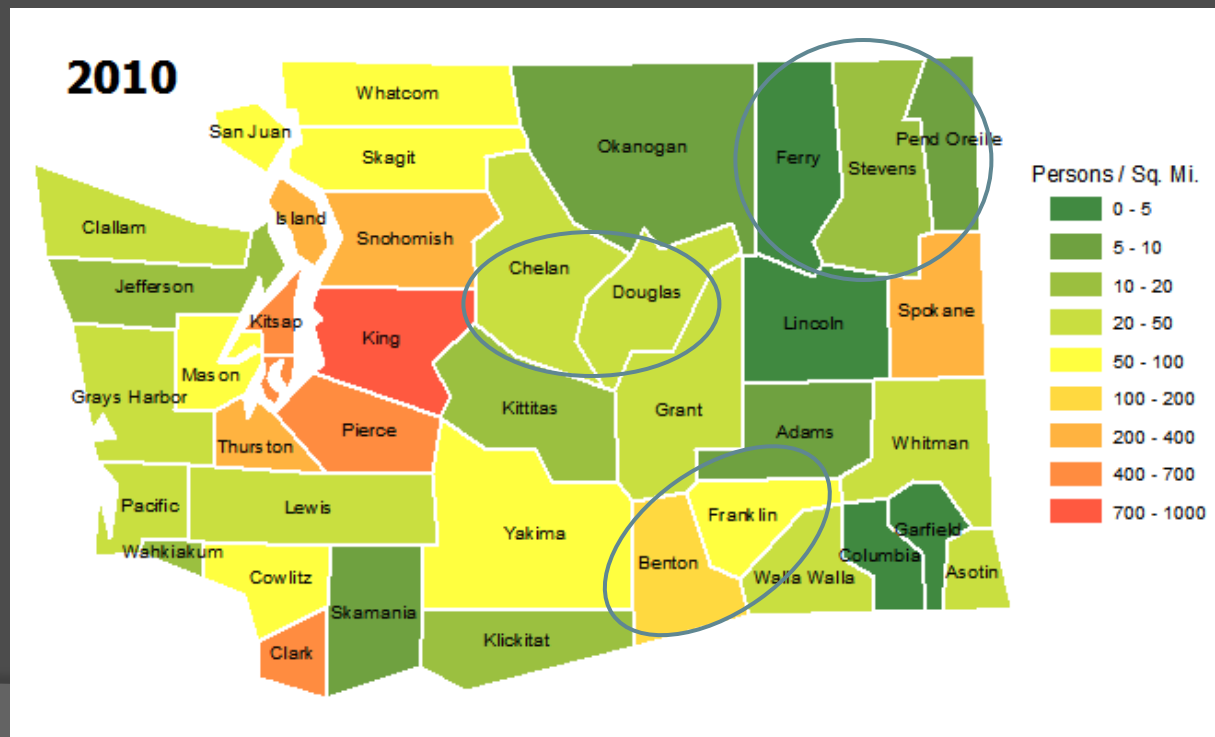
WASHINGTON STATE IMPLEMENTATION OF INPATIENT SURVEILLANCE

Natasha Close, MPH
Washington State Department of Health
March 8, 2012



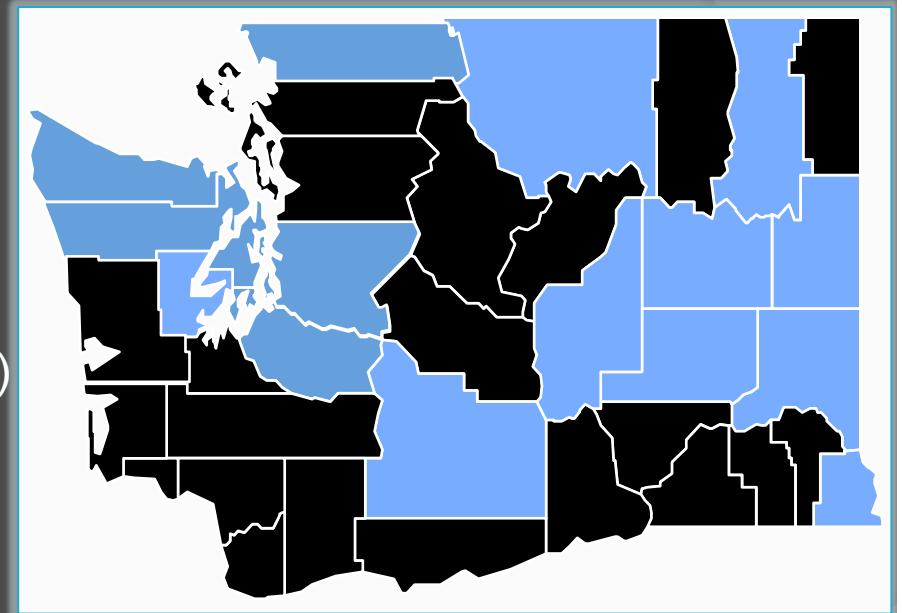
Public Health in Washington

- Population (4/1/11 estimate): 6,767,900
- 35 local health jurisdictions (LHJs)
- Home rules state

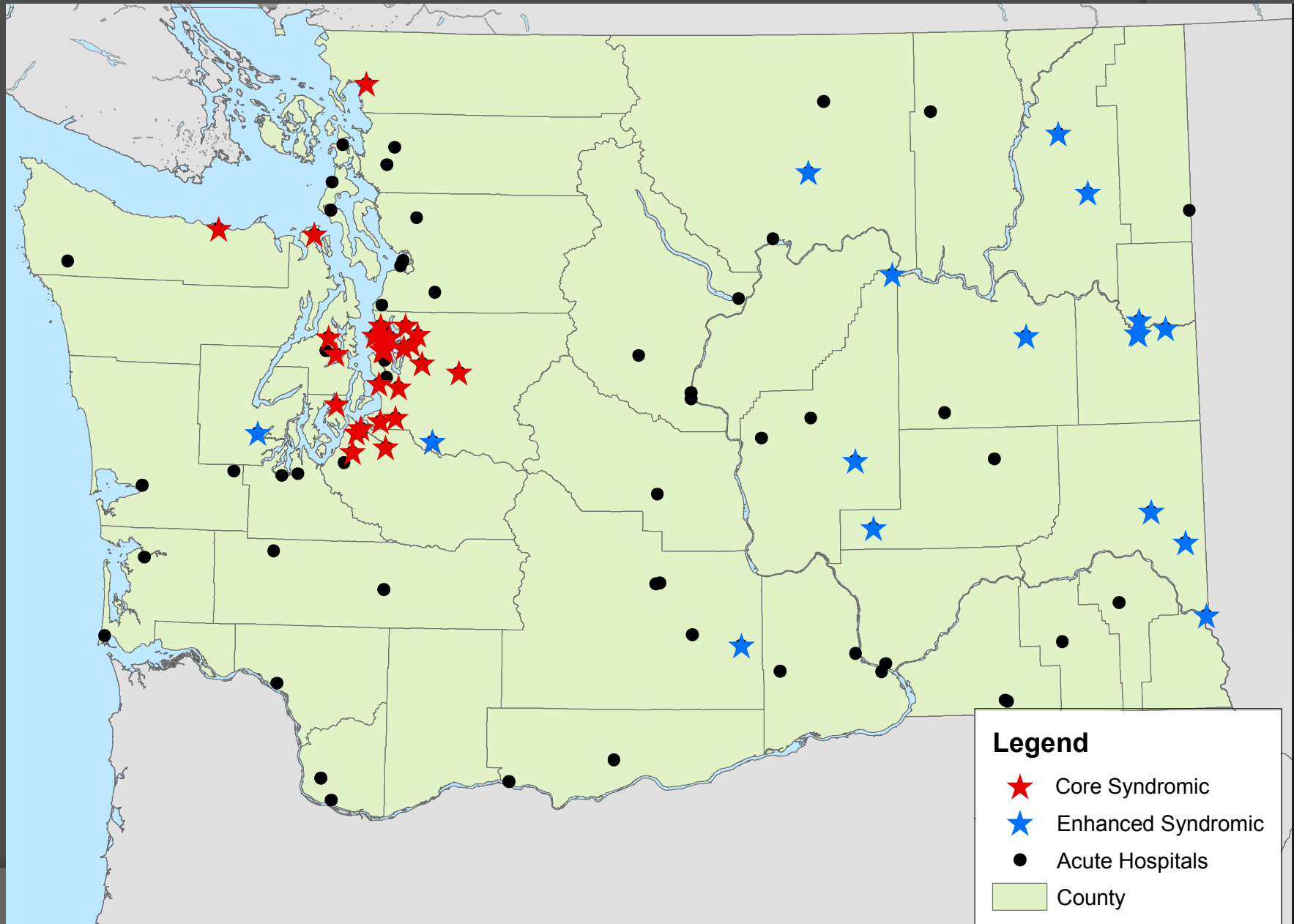


Syndromic Surveillance in WA

- Established in 2003
- Submission is voluntary
 - 16/39 counties with ≥ 1 facility
- Recruitment:
 - Pre-MU:
 - Recruited by LHJ with assistance from the Department of Health (DOH) (n=28)
 - RHIO contract with CDC (n=17)
 - Post-MU:
 - DOH interacts directly with submitters
 - 1 Point of Contact for syndromic and ELR
 - Test messages received from 14 facilities (3 new)
- ESSENCE system hosted by DOH



Syndromic Surveillance Facilities



Core vs. Enhanced

	Core (n=28)	Enhanced (n=17)
Start Year	2003	Late 2008
Data sources		
ED	X	X
Urgent Care	X	X
Outpatient		X
Inpatient		X
Microbiology Labs		X
Medical Record System	Variety	Meditech
Message frequency	1 per 24 hours	1 per 15 min
Message format	Flat file	HL7 2.5.1*
Message transport	SFT (8 feeds)	PHINMS (1 feed)
Data elements	ESSENCE only	ESSENCE +

*ADT^A01^ADT_A01, ADT^A03^ADT_A03, ADT^A04^ADT_A01, ADT^A06^ADT_A06, ADT^A07^ADT_A06, ADT^A08^ADT_A01, ADT^A11^ADT_A09, ADT^A13^ADT_A01, ORM^O01^ORM_O01, ORU^R01^ORU_R01

Enhanced Data Elements

- Facility information:

- Name
- Zip
- County

- Patient demographics:

- Patient ID
- DOB (MM/YYYY)
- Age
- Gender
- Race/Ethnicity
- Zip, County, State

- Visit information:

- Visit ID
- Date of admission & discharge
- Admission source
- Service area & assigned location

- Visit information cont.:

- Chief complaint
- Temperature at admission
- O2 saturation on admission
- Discharge disposition
- Self-reported flu vaccination
- Self-reported pregnancy

- Diagnosis information:

- All diagnoses (ICD9 coded)
- Rank
- Status (Admitting, working, final)

- Microbiology laboratory orders and results:

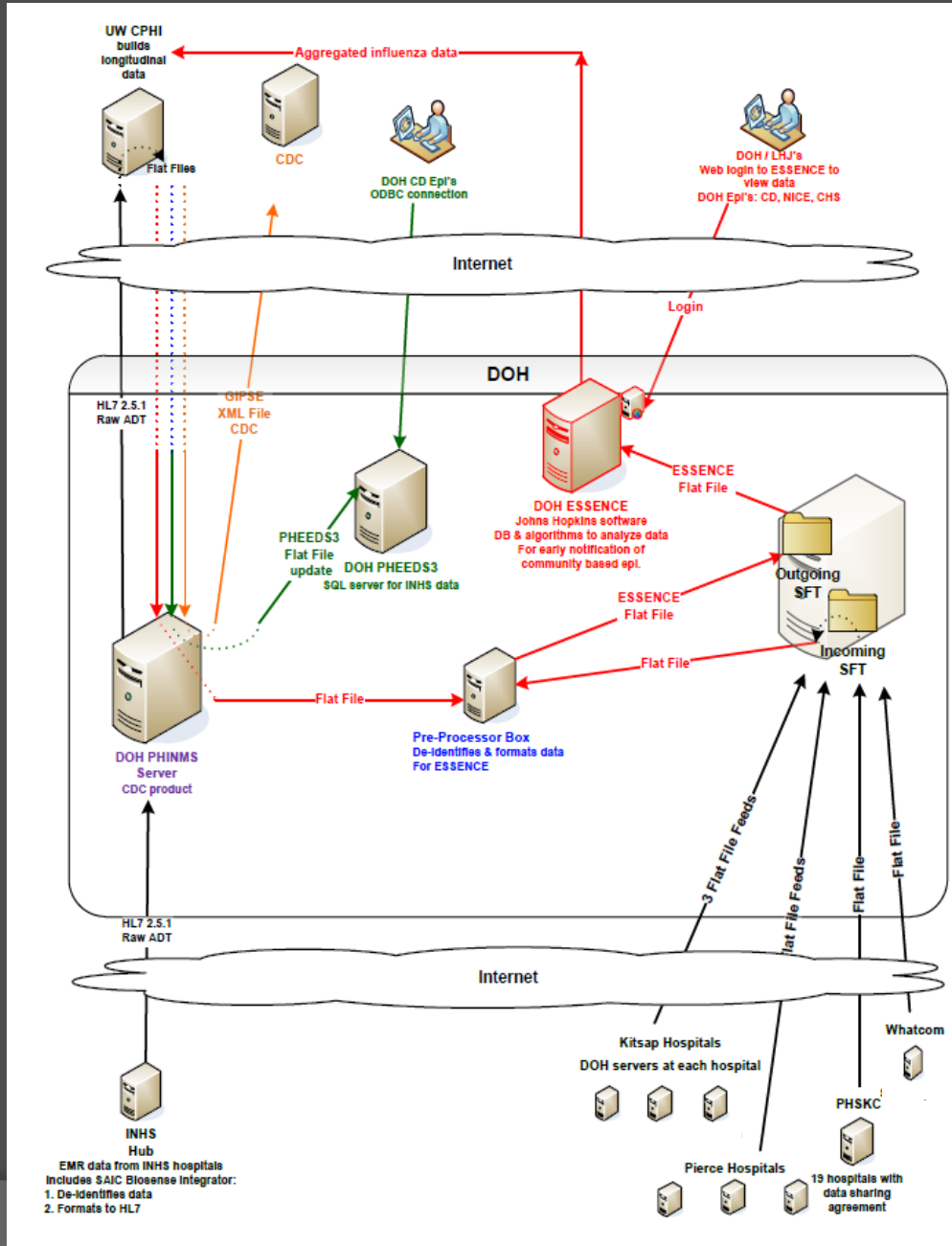
- Test code (Loinc and local)
- Specimen source and collection date

Completeness of Enhanced Syndromic Data

Variable	% Complete		Variable	% Complete	
	ED	Inpatient		ED	Inpatient
Age	100%*	100%	Discharge disposition	90%	98%
Sex	100%	100%	Any working or final diagnosis	87%	89%
Race	97%	99%	Any final discharge diagnosis	1.8%	71%
Zip	99%	100%	Self-reported pregnancy for women of reproductive age	24%	24%
Admit Date	100%	100%	Self-reported flu vaccination	72%	73%
Discharge Date	89%	98%			

*0.05% age>120

Data Collection & Processing



Inpatient Data Collection and Processing

RHIO



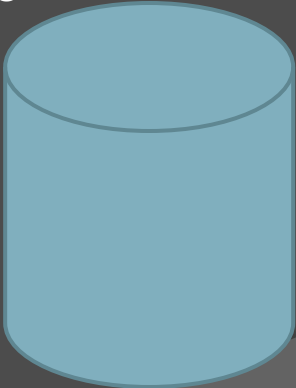
HL7



ED data

Outpatient, ED, inpatient, laboratory data

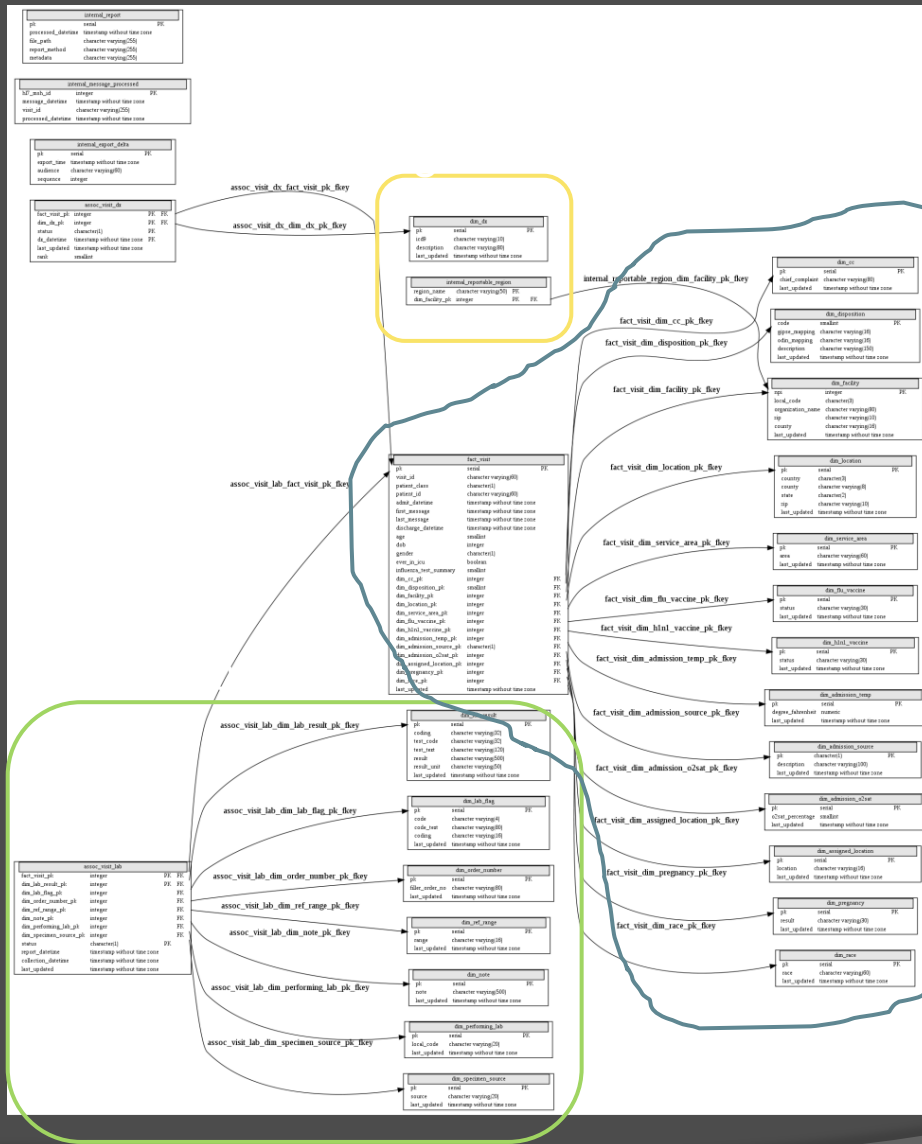
Longitudinal Database



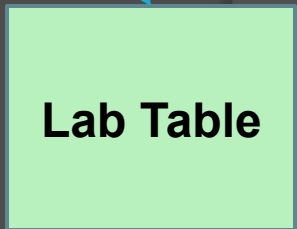
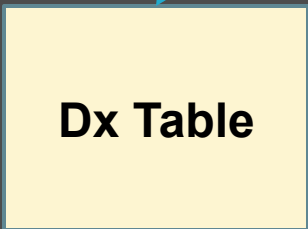
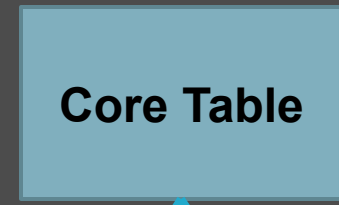
Aggregate ED ILI data

Distribute

Longitudinal Database Structure



Simplifies to 3 view tables linked by Primary Key



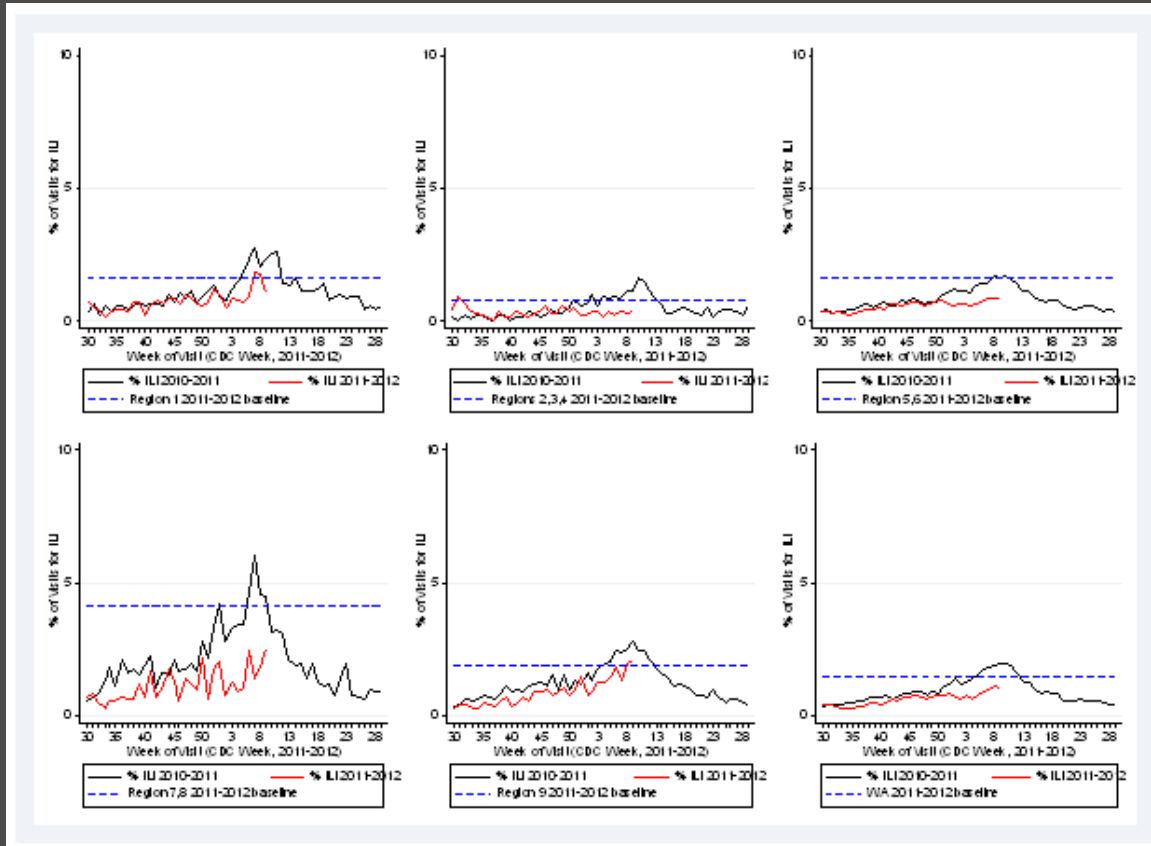
- 1 core record per visit (ED Visit & Inpatient Admission = 2 records)
- 1 record per lab result
- 1 record per diagnosis

Data Uses

- Situational awareness
 - Influenza-like illness (ILI) in EDs
 - Lab-confirmed influenza hospitalizations
 - Known outbreaks or public health emergencies
 - Large events (e.g., 2010 Olympics)
- Identification of potential notifiable conditions
- Dispel or confirm rumors
- Special projects:
 - Evaluate influenza vaccination coverage in women delivering (and other high-risk populations)
 - Evaluation of invasive-pneumococcal disease hospitalizations

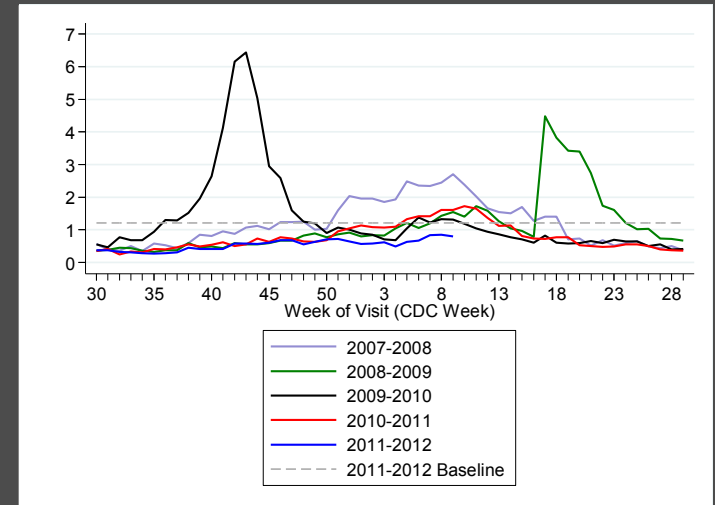
Situational Awareness: ILI

Assess geographic spread (sporadic, local, regional, widespread) of influenza

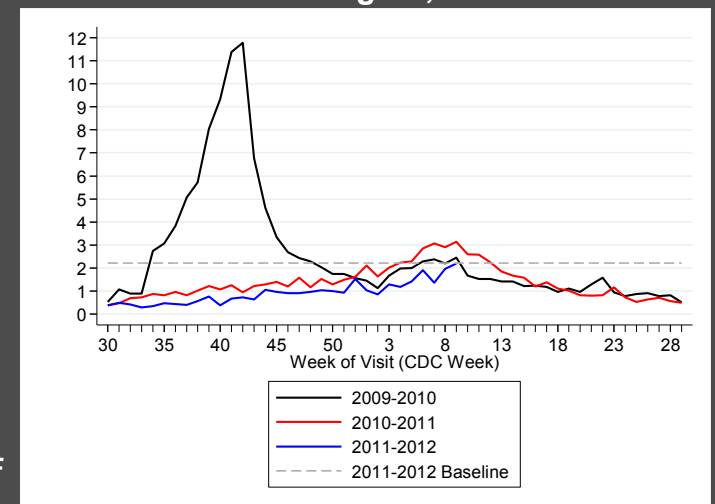


Weekly Influenza Update

Percentage of ER Visits for ILI by CDC Week, Western Washington, 2007–2012



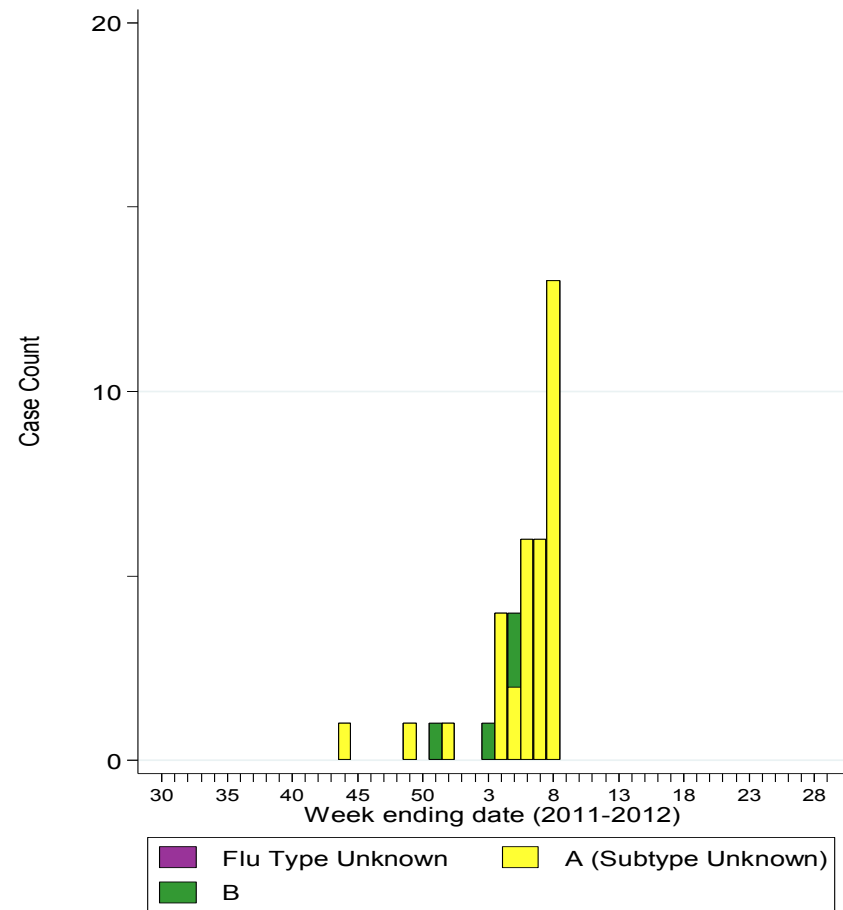
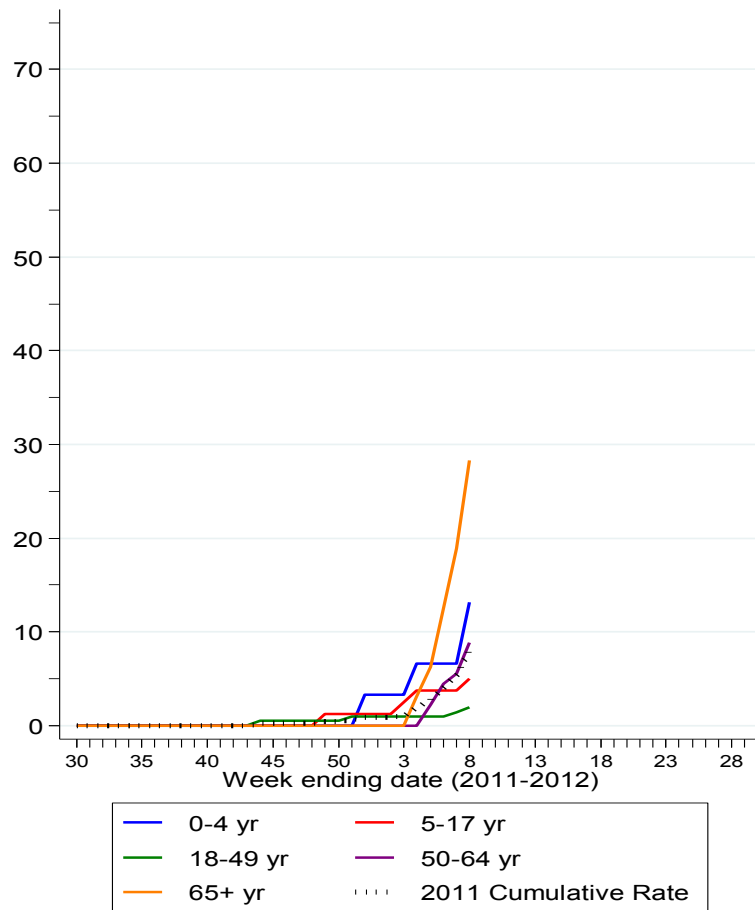
Percentage of ER Visits for ILI by CDC Week, Eastern Washington, 2009–2012



Situational Awareness: Lab-confirmed Influenza Hospitalizations

Laboratory-Confirmed Cumulative Hospitalization Rates by Age Group (per 100,000), Spokane County, Washington 2011–2012

Hospitalized Laboratory-Confirmed Influenza Cases by Week of Hospital Admission, Spokane County, Washington 2011–2012



Validation of Lab-confirmed Influenza Hospitalizations in 4 Spokane Hospitals

	Syndromic Data	Traditional Reporting
Sensitivity	90%	91%
Positive Predictive Value	94%	--
Timeliness (days)	5 (0 to 53)*	2 (0 to 22)

- Electronic data useful for flu hospitalization surveillance
 - Good sensitivity and specificity → representative
 - Adequate timeliness
 - Overall, data complete
- Microbiology lab data increases sensitivity and PPV of discharge diagnoses

* For 94% of inpatient admissions, 1st record transmitted the same day as admission

Evaluation of Flu Vaccination Status in Women Delivering at Enhanced Syndromic Sites

- December 2010
- 731 deliveries
- 571 (78%) had a known flu vaccine status
 - 174 (30%) reported receiving the flu vaccine this season
 - 397 (70%) reported not receiving the flu vaccine this season
- Information shared in a “Dear Colleague” letter distributed to WSMA, WSHA, and WSNA encouraging adult immunizations

Lessons Learned

- ⦿ High variability between facilities
- ⦿ Develop a relationship with data provider
 - Questions, validation activities, data drop-outs
- ⦿ Learn as much as you can about how the data is collected and what happens to it before you receive it (e.g. Who recorded? When?)
- ⦿ Ongoing validation required
 - Data drop outs (facility or intra-facility level)

Advantages of Inpatient Syndromic Surveillance

- ⦿ Allows more complete view of each patient visit
- ⦿ Enables public health to monitor severe episodes of high volume conditions in near real-time
 - Saves providers and hospitals time
 - Reduces need for local health departments to collect and manually enter data
 - Timeliness allows for public health intervention
- ⦿ Increases completeness of reporting if used in addition to NC reporting

Challenges

- Infrastructure to receive, process, and store data (e.g., staffing, hardware)
- Complexity of data analysis
- Standardization of the data
 - HL-7 messaging standardizes the fields transmitted but not content of fields
- Understanding and validating the data
 - Variation in EHR's
 - Varying workflows
 - Tracking changes at hospitals

Future Plans

- ⦿ Expand geographically under “meaningful use”
- ⦿ Enhance sustainability of HL7 processing → modular, “cloud-ready” design
- ⦿ Movement of HL7 processing to BioSense 2.0 locker
- ⦿ Consolidate receipt of data feeds through state HIE Hub
- ⦿ Explore the use of discharge diagnoses & lab results for identifying notifiable conditions
- ⦿ Explore ability to identify co-morbidities and risk factors
- ⦿ Explore ability to monitor other conditions of public health significance
 - Varicella
 - Non-infectious conditions

Thank you!
Questions?

Natasha Close

Natasha.Close@doh.wa.gov

