

An Overview of Successful Large-Scale Automated Case Detection: Assisting Public Health with the Identification of Reportable Conditions

Shaun Grannis, MD, MS, FAAFP

The Regenstrief Institute

Indiana University School of Medicine

Indiana Center of Excellence in Public Health Informatics

Sept 2, 2010

icePHi
Indiana Center of Excellence
in Public Health Informatics



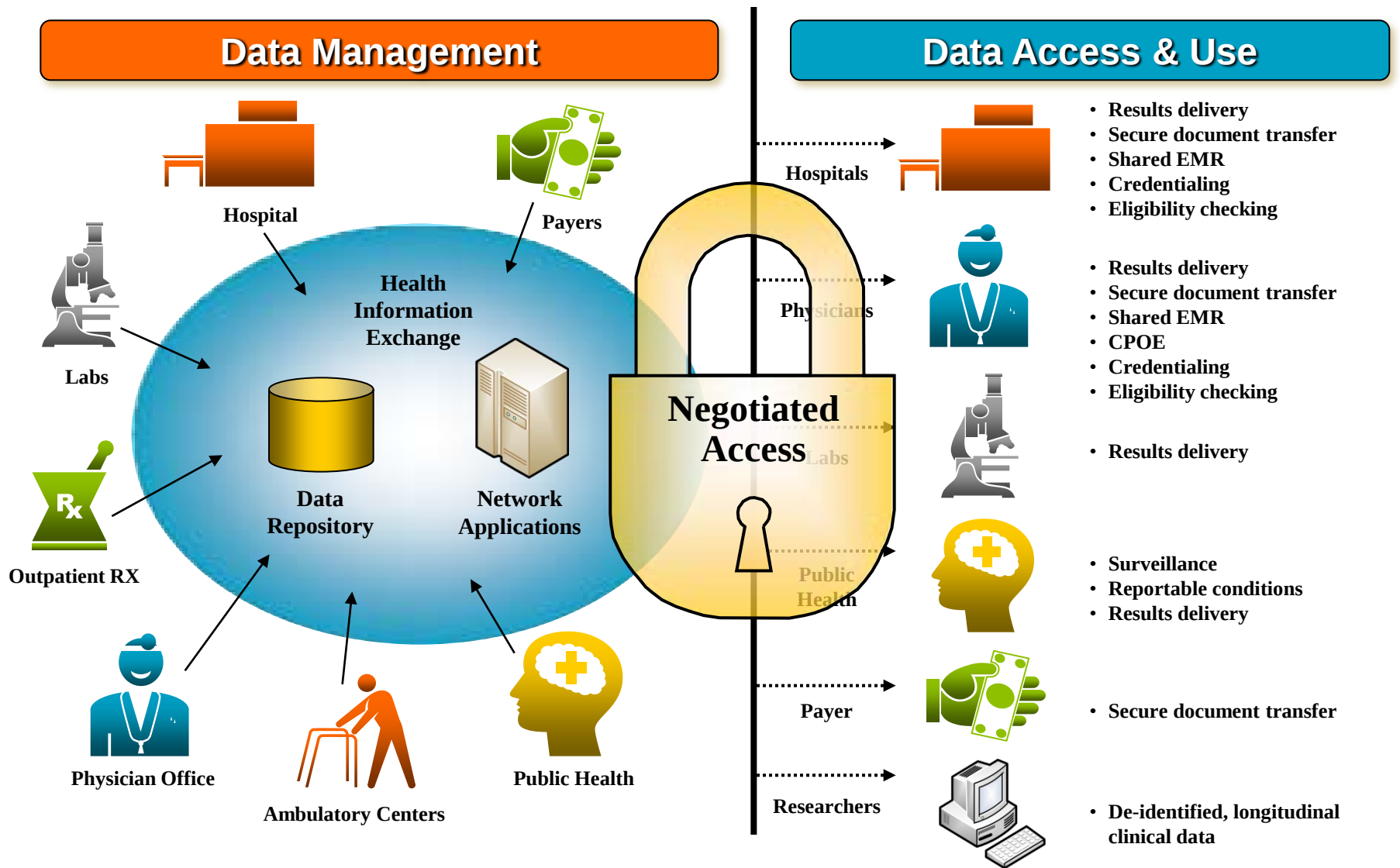
Regenstrief Medical Informatics
The **Source** for Medical Informatics

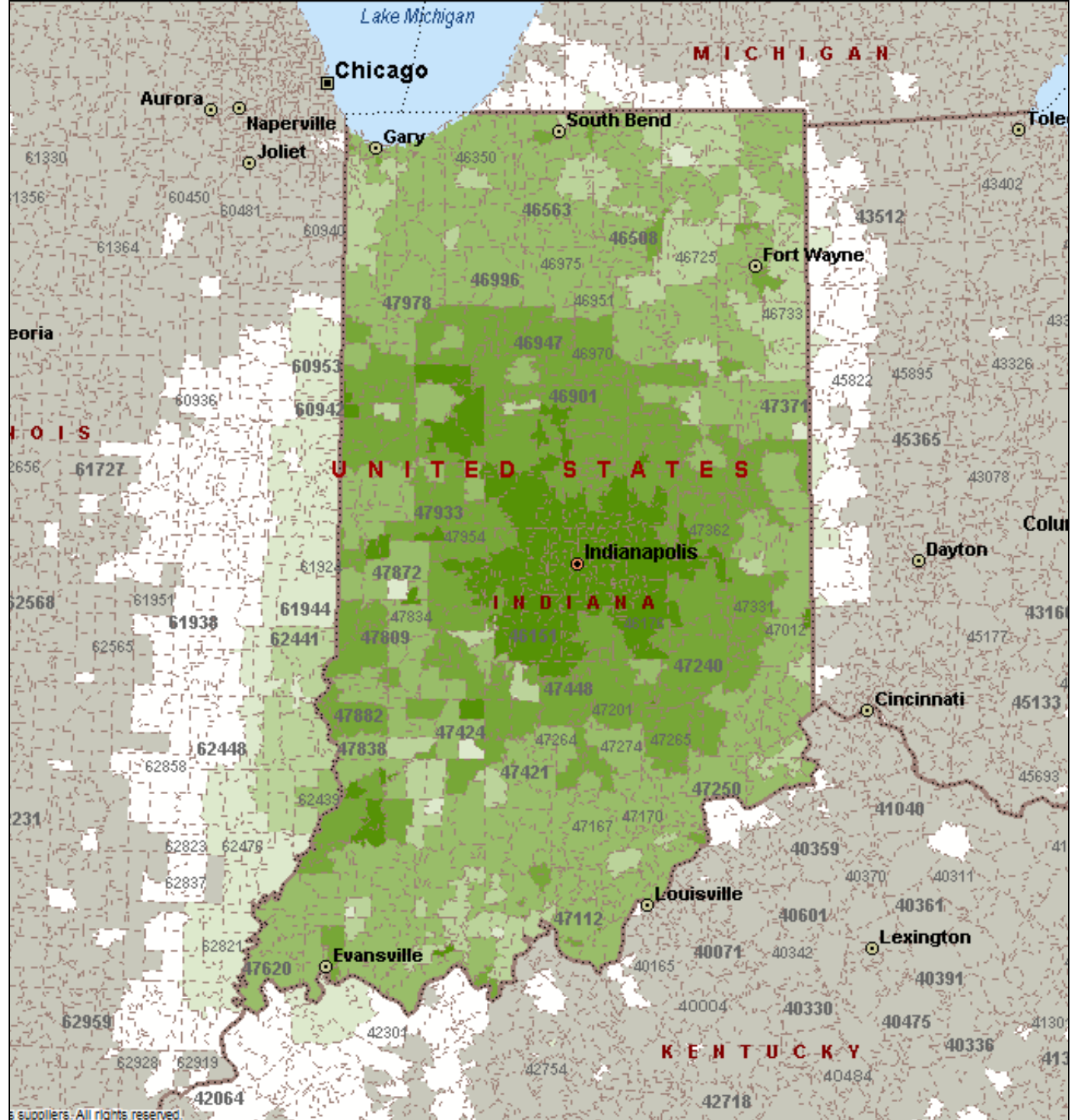
What we'll cover

- Context of the System: The Regenstrief Institute and HIE
- Premises, Challenges and Strategic Considerations
- System Basics and Initial Successes
- Next Generation System, Initial Results, and Ongoing work
- Concluding Remarks

Context of the System

The Indiana Network for Patient Care





Premises, Challenges and Strategic Considerations

Premises

- To optimally manage the public health disease burden in a community, the true public health disease burden of a community must be ascertained
- Determining disease burden is strongly dependent upon information generated in clinical care processes
- However ...

Challenges

- Information generated in clinical care is highly variable and often incomplete
 - Variations differ across organizations
 - Variations differ across time within organizations
- Far less than half of physicians have a fully functional EHR system
- Clinical care processes under-report to public health (Thacker)
 - Reporters overburdened/under-resourced
 - Reporters lack knowledge, willingness
 - Clinical data is scattered across disparate settings
- Reporting requirements vary over time and geography

The Strategy

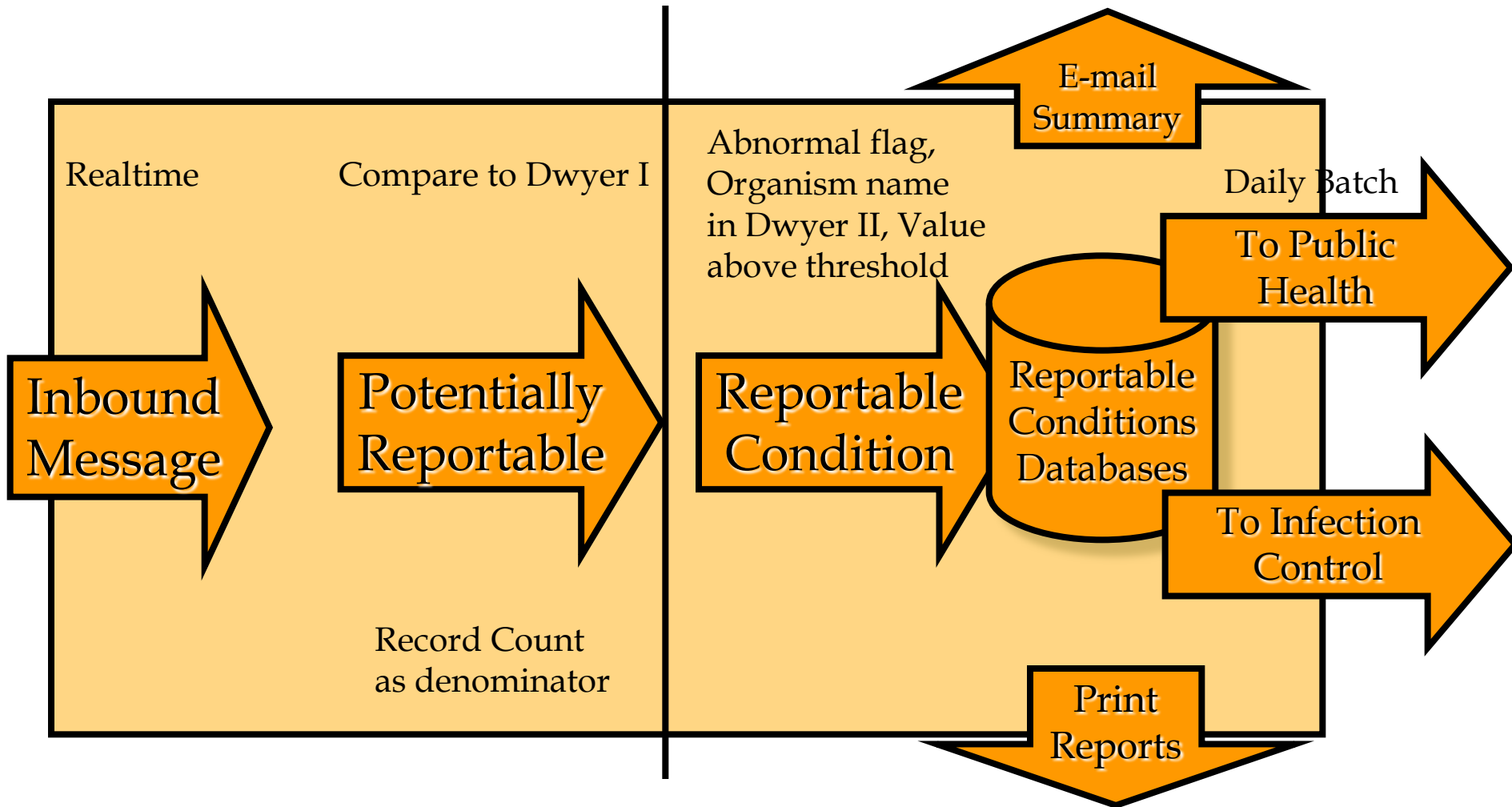
- Leverage (re-use) existing clinical data flows to augment public health reporting
- Minimize the need for human intervention in the reporting process by ...
- Standardizing (to the extent possible in a sustainable fashion) the heterogeneous data so computers can automatically inspect

A Strategic Consideration

- Who identifies whether a clinical case is reportable?

System Basics and Initial Successes

System Overview: Notifiable Condition Detector

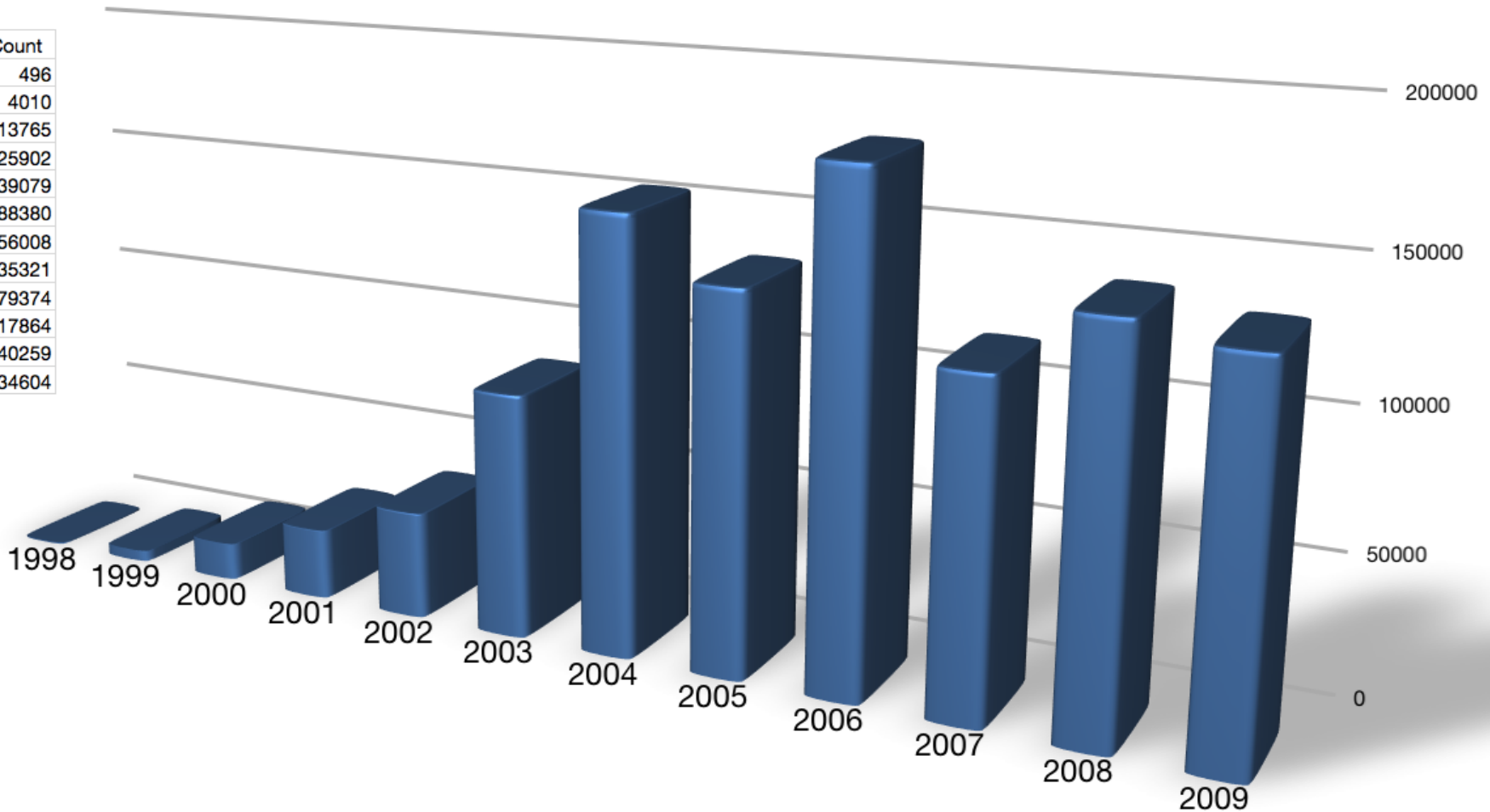


Up to 70+ Data Elements per Record

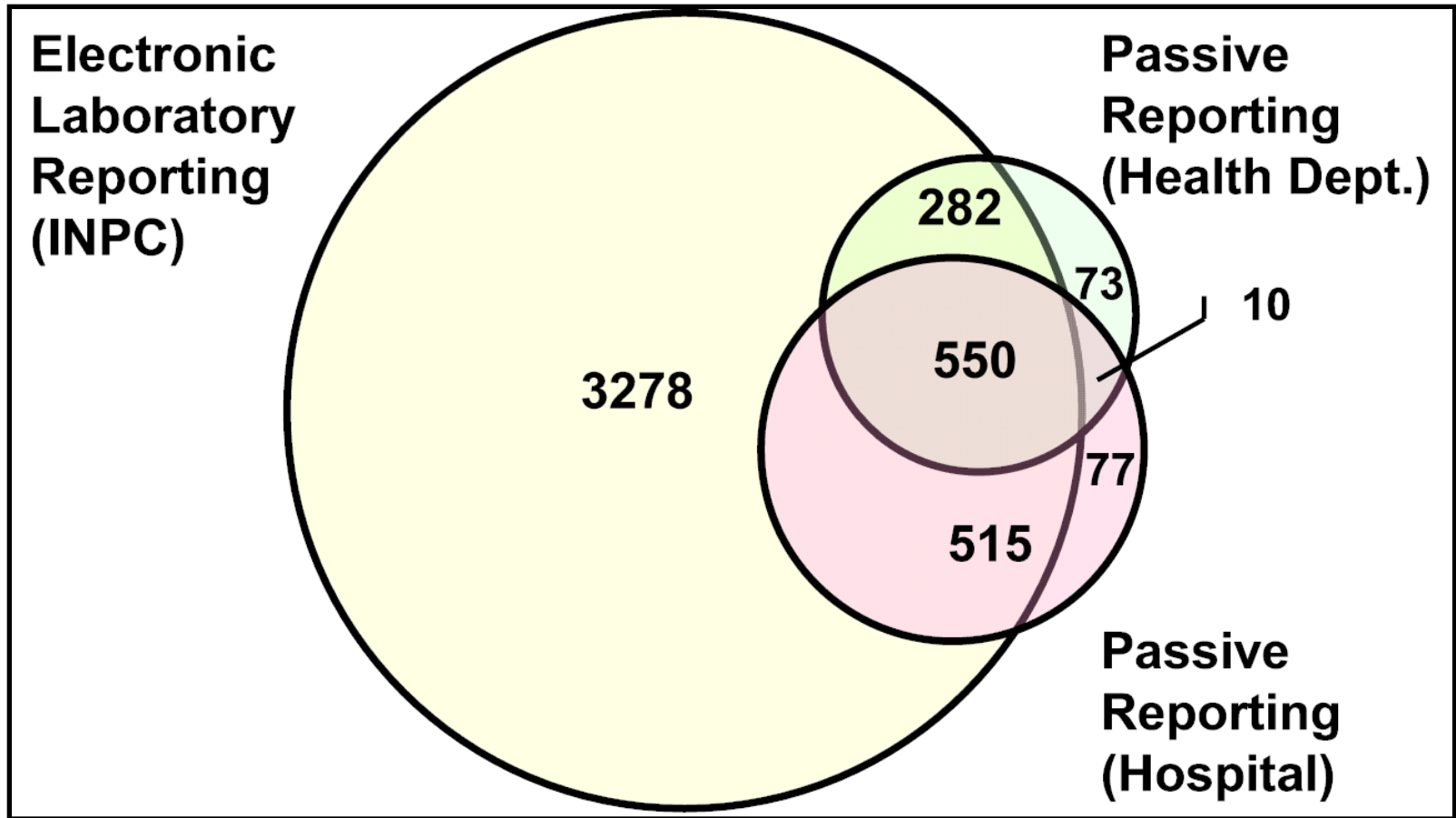
UNIQUE_RECORD_NUM	SOURCE_INSTITUTION	INSTITUTION_ID_TYPE	PAT_INST_MED_REC_ID
GLOBAL_ID	UNIQUE_REGISTRY_NUM	PAT_SOCSEC	PAT_NAME
PAT_BIRTH	PAT_SEX	PAT_RACE	PAT_PHONE
PAT_STREET1	PAT_STREET2	PAT_CITY	PAT_COUNTY
PAT_STATE	PAT_ZIP	PAT_COUNTRY	PROVIDER_NAME
PROVIDER_NAME_MATCHED	PROVIDER_SSN	PROVIDER_BIRTH	PROVIDER_PRACTICE
PROVIDER_STREET	PROVIDER_CITY	PROVIDER_STATE	PROVIDER_ZIP
PROVIDER_COUNTY	PROVIDER_PHONE	PROVIDER_FAX	PROVIDER_LOCAL_ID
PROVIDER_DEA_NUM	PROVIDER_LICENSE	LAB_NAME	LAB_IDENTIFIER
LAB_PHONE	LAB_STREET1	LAB_STREET2	LAB_CITY
LAB_STATE	LAB_ZIP	TEST_IDENTIFIER	TEST_NAME
TEST_CODESYS	TEST_PLACER_ORDER_NUM	TEST_FILLER_ORDER_NUM	TEST_DATE
TEST_PARENT_PLACER	TEST_PARENT_FILLER	TEST_SPECIMEN_TEXT	TEST_LOINC_CODE
TEST_DATA_TYPE	TEST_NORMAL_RANGE	TEST_ABNORMAL_FLAG	TEST_COMMENT
TEST_RCVD_DATE_TIME	TEST_MPQ_SEQ_NUMBER	TEST_RESULT_IDENTIFIER	TEST_RESULT_NAME
TEST_RESULT_CODESYS	TEST_RESULT_SUBID		TEST_RESULT_LOINC_CODE
	TEST_RESULT_CODE		
TEST_RESULT_VALUE	TEST_RESULT_UNITS	TEST_RESULT_STATUS	TEST_PREVIOUS_DATE
DWYER_CONDITION_NAME	HEALTH_DEPT_AGENCY	HEALTH_DEPT_PATIENT_ID	HEALTH_DEPT_CASE_ID
MAPPED_LOINC	OBR_ALT_CODE	OBR_ALT_CODE_TEXT	OBR_ALT_CODE_SYS
OBX_ALT_CODE	OBX_ALT_CODE_TEXT	OBX_ALT_CODE_SYS	

Notifiable Messages by Year

Year	Count
1998	496
1999	4010
2000	13765
2001	25902
2002	39079
2003	88380
2004	156008
2005	135321
2006	179374
2007	117864
2008	140259
2009	134604



ELR Completeness[†]



4,785 total reportable cases
INPC– 4,625 (97%)
Health Dept – 905 (19%)
Hospitals – 1,142 (24%)

[†]Overhage, Grannis, McDonald. A Comparison of the Completeness and Timeliness of Automated ELR and Spontaneous Reporting of Notifiable Conditions. *Am J Pub Health* 2008 98:344-350.

TABLE 2—Reporting Timeliness for Traditional Methods and Electronic Laboratory Reporting, by Condition: Indianapolis, Ind, 2001

Condition	Spontaneous Reporting (Public Health Department)	
	Average Lag Time, Days	No. of Cases
Campylobacteriosis	0.0	1
Chlamydial infection	10.0	363
Cryptosporidiosis	0.0	1
<i>Escherichia coli</i> O157:H7 infection	-1.0	1
Giardiasis	3.5	2
Hepatitis A	4.0	4
Hepatitis B	2.2	17
Hepatitis C	5.5	157
Histoplasmosis	-8.5	4
Salmonellosis, nontyphoid	-1.0	3
Shigellosis	0	24
<i>Streptococcus</i> : group A	1.2	5
<i>Streptococcus</i> : group B	20.0	2
Syphilis	4.4	17

Note. Negative values indicate that electronic laboratory reports were received later than were spontaneous reports on average. Only conditions for which timeliness could be calculated are included.

Timeliness

ELR identified cases 7.9 days earlier than did spontaneous reporting.

†Overhage, Grannis, McDonald. A Comparison of the Completeness and Timeliness of Automated ELR and Spontaneous Reporting of Notifiable Conditions. *Am J Pub Health* 2008 98:344-350.

Next Generation System, Initial Results, and Ongoing work

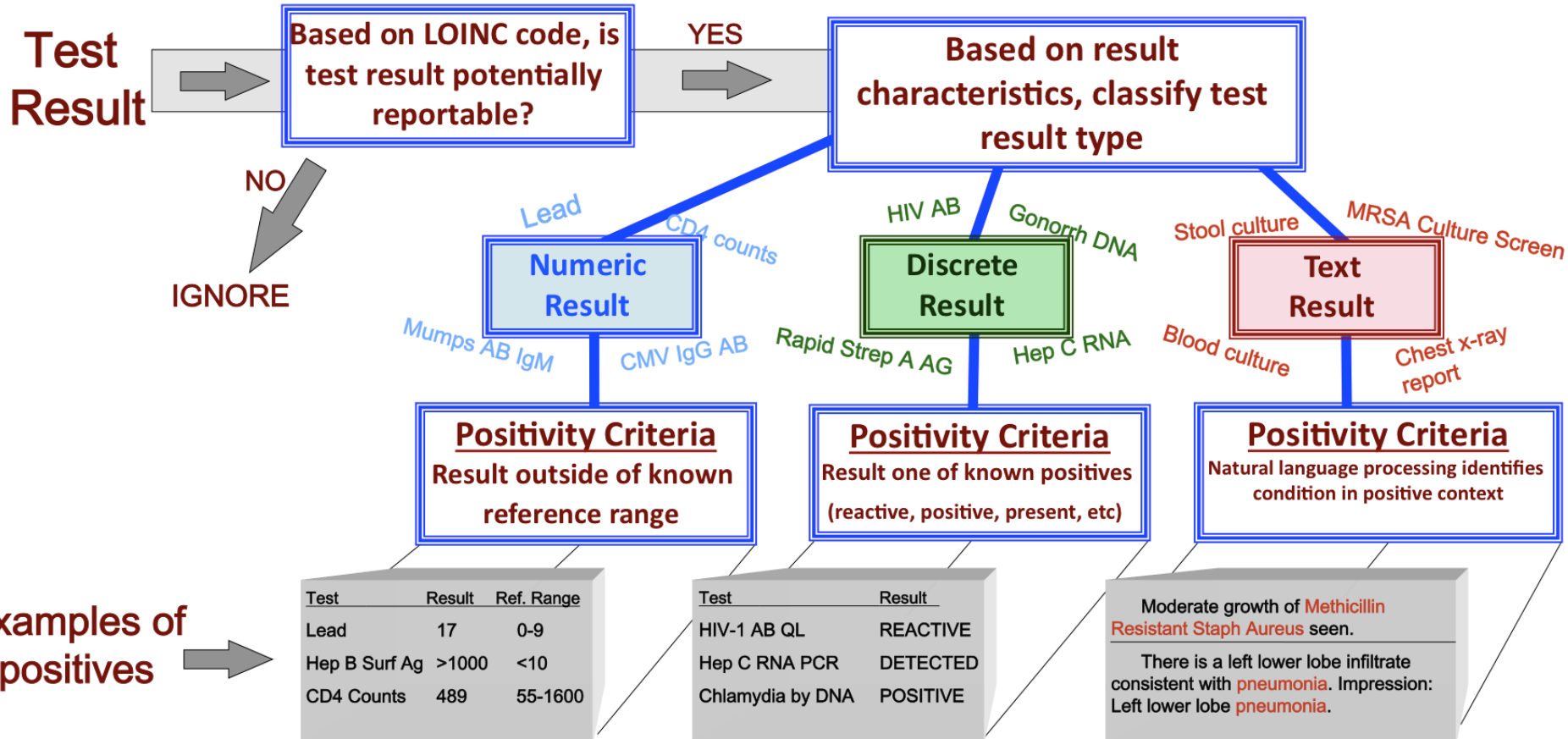
Agent Framework

- Because data heterogeneity varies by organization and with time, we opted to create a small number of discrete agents that target:
 - Data classes
 - Clinical tests
 - Data sources
 - Flagged results
- This framework has been tested in the HIE with thousands of data sources in a variety of settings (outpatient, inpatient, etc.)

Data Class Agents

- Numeric agent
 - Clinical result is numeric
 - Numeric result falls out of range
- Discrete agent
 - Clinical result is discrete ('positive', 'reactive', 'detected')
 - Discrete result meets positive criteria
- Free Text Agent
 - Clinical result is free-form text
 - NLP identifies condition in a positive context

Data Class Agents



“Report All” Agents

- Clinical Test Agent
 - Some tests may be always reportable (e.g., serum lead levels, HIV PCR Quantification)
 - When the test is identified, automatically report
- Data Source Agent
 - Some data submitters only send results that are reportable
 - When the a “report all” source is identified, automatically report

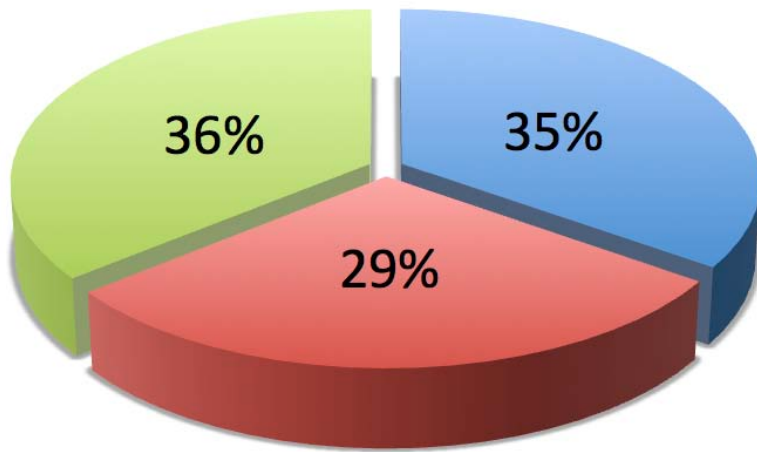
Additional Agents

- Abnormal Flag Agent
 - When the HL7 abnormal flag is set and LOINC code is reportable for a single condition, report for that condition
- Decided Result Agent
 - The outcome (“report” or “not report”) is stored for each adjudicated {LOINC|Result} combination
 - Before calling computationally expensive agents, a “decided result” agent determines if this combination has been adjudicated previously
 - If combination is present, use previous decision

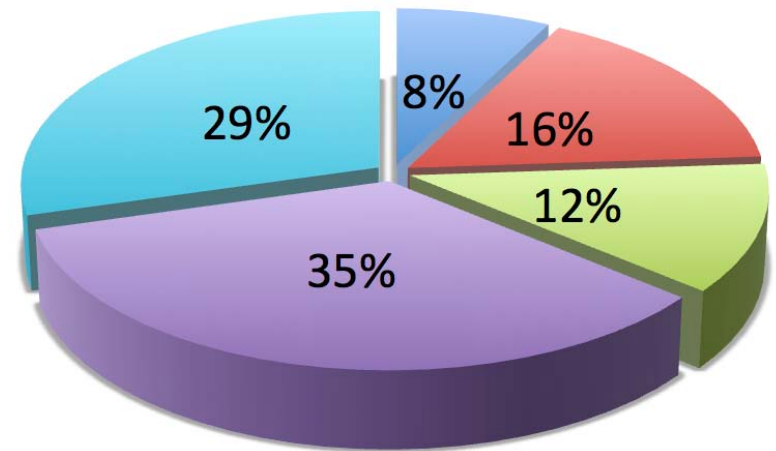
Agent Processing Order

1. Report All Agents
2. Decided Result Agent
3. Data Class Agents
4. Abnormal Flag Agent

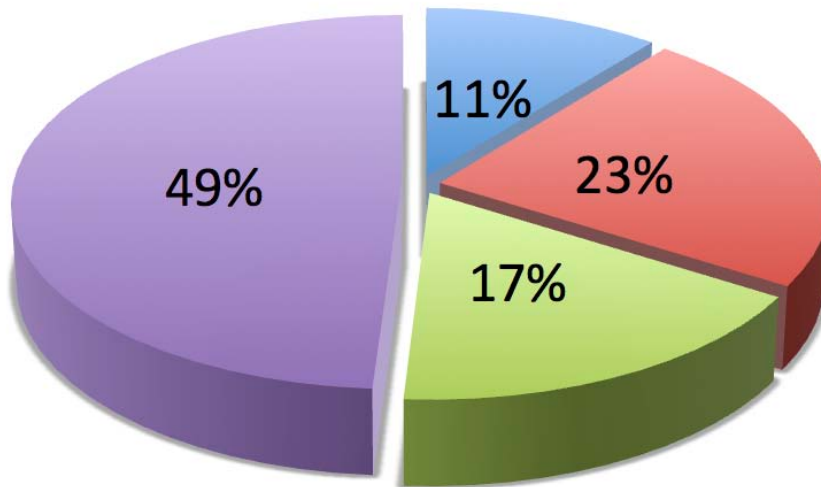
Agent “Hit” Rates



- Decided Result Agents
- Report all Agents
- All Other Agents



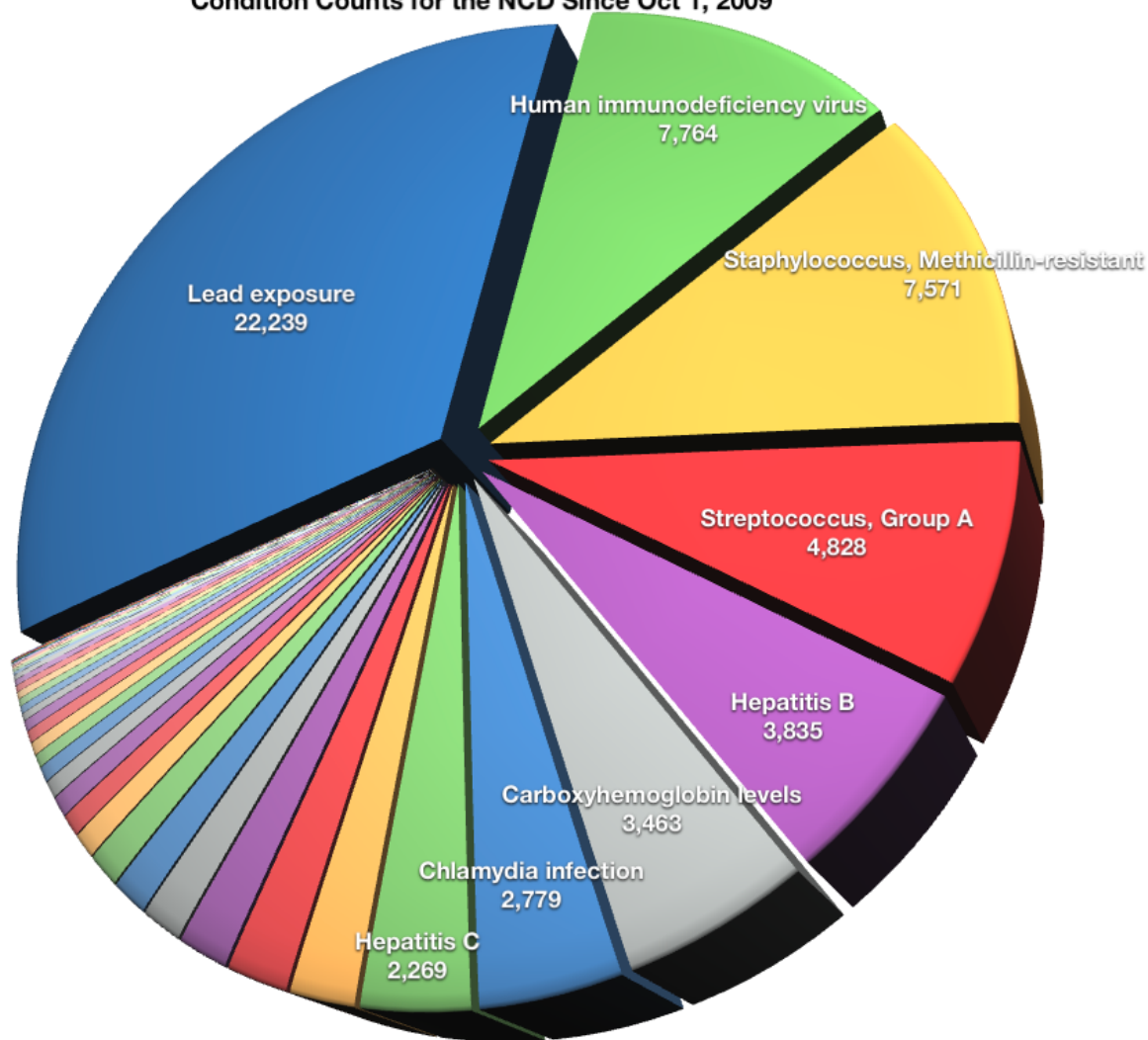
- Abnormal Flag
- Discrete
- Numeric
- Text
- Report All



- Abnormal Flag
- Discrete
- Numeric
- Text

Condition Counts for the NCD Since Oct 1, 2009

Condition	Count
Lead exposure	22239
Human immunodeficiency virus	7764
Staphylococcus, Methicillin-resistant	7571
Streptococcus, Group A	4828
Hepatitis B	3835
Carboxyhemoglobin levels	3463
Chlamydia infection	2779
Hepatitis C	2269
Sickle cell disease	1418
Escherichia coli O157:H7 infection	1393
Trichomoniasis	1190
Gonorrhea	997
Influenza	903
Measles	832
Herpes simplex type 1	600
Syphilis	528
Hepatitis A	488
Coccidioidomycosis	419
Chickenpox	369
Cytomegalovirus	308
Genital warts	308
Herpes simplex type 2	290
Fifth's disease	255
Legionellosis	179
Salmonellosis, non-typhoid	175
Mumps	174
Tuberculosis	165
Herpes simplex	158
Pertussis	137
Streptococcus pneumoniae	116
Histoplasmosis	73
Lyme disease	71
Toxoplasmosis	48
Streptococcus, Group B	38
Shigellosis	25
Giardiasis	23



- | | | | |
|-------------------------------|--------------------------------------|---|--------------------------|
| ● Lead exposure | ● Human immunodeficiency virus | ● Staphylococcus, Methicillin-resistant | ● Streptococcus, Group A |
| ● Hepatitis B | ● Carboxyhemoglobin levels | ● Chlamydia infection | ● Hepatitis C |
| ● Sickle cell disease | ● Escherichia coli O157:H7 infection | ● Trichomoniasis | ● Gonorrhea |
| ● Influenza | ● Measles | ● Herpes simplex type 1 | ● Syphilis |
| ● Hepatitis A | ● Coccidioidomycosis | ● Chickenpox | ● Cytomegalovirus |
| ● Genital warts | ● Herpes simplex type 2 | ● Fifth's disease | ● Legionellosis |
| ● Salmonellosis, non-typhoid | ● Mumps | ● Tuberculosis | ● Herpes simplex |
| ● Pertussis | ● Streptococcus pneumoniae | ● Histoplasmosis | ● Lyme disease |
| ● Toxoplasmosis | ● Streptococcus, Group B | ● Shigellosis | ● Giardiasis |
| ● Human T-lymphotrophic virus | ● Cryptococcosis | ● Q fever | ● Rubella |
| ● Rotavirus | ● Campylobacteriosis | ● Bartonellosis | ● Arbovirus |
| ● Blastomycosis | ● Hepatitis D | ● Tularemia | |

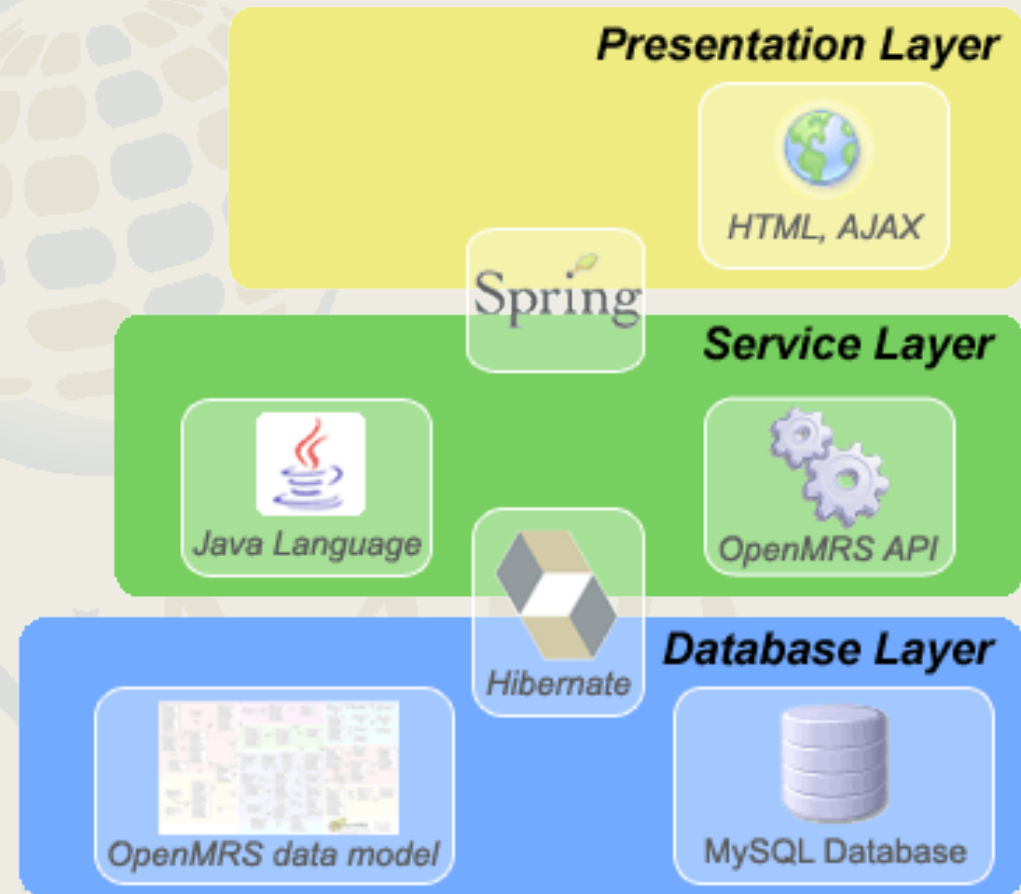
HIV Co-morbidities

<u>Co-morbid Condition</u>	<u>Count</u>
Hepatitis C	33 (4%)
Hepatitis A	33 (4%)
Salmonella	27 (3%)
Hepatitis B	21 (2.5%)
Syphilis	17 (2.1%)
HSV type 2	17 (2.1%)

*Co-morbid reportable conditions among 808
HIV positive patients identified in April 2010*

OpenMRS - API

- Three code layers
 - Database Layer
 - Service Layer
 - Presentation Layer
- Hibernate, Spring, AJAX



Software Overview

 OPENMRS

Currently logged in as Super User | [Log out](#) | [My Profile](#) | [Help](#)

[Home](#) | [Find/Create Patient](#) | [Dictionary](#) | [Cohort Builder](#) | [Administration](#)


OPENMRS
MEDICAL RECORD SYSTEM

Hello, Super. Welcome to Openmrs.

[English \(United Kingdom\)](#) | [português](#) | [English \(United States\)](#) | [italiano](#) | [français](#) | [español](#) | Last Build: Sep 14 2009 01:34 PM | Version: 1.5.0 Build 10342

Administration

Users

[Manage Users](#)
[Manage Roles](#)
[Manage Privileges](#)
[Manage Alerts](#)

Patients

[Manage Patients](#)
[Manage Tribes](#)
[Find Patients to Merge](#)
[Manage Identifier Types](#)

Person

[Manage Relationship Types](#)
[Manage Person Attribute Types](#)

Encounters

[Manage Encounters](#)
[Manage Locations](#)
[Manage Encounter Types](#)

Observations

[Manage Observations](#)

Orders

[Manage Orders](#)
[Manage Drug Orders](#)
[Manage Order Types](#)

Scheduler

[Manage Scheduler](#)

Programs

[Manage Programs](#)
[Manage Triggered State Conversions](#)

Concepts

[View Concept Dictionary](#)
[Manage Concept Drugs](#)
[Manage Proposed Concepts](#)
[Update Concept Words](#)
[Derive Concept Sets](#)
[Manage Concept Classes](#)
[Manage Concept Datatypes](#)
[Manage Concept Sources](#)

Forms

[Manage Forms](#)
[Manage Fields](#)
[Manage Field Types](#)

HL7 Messages

[Manage Queued Messages](#)
[Manage Deleted Messages](#)
[Manage HL7 Errors](#)

Maintenance

[Set Implementation Id](#)
[System Information](#)
[Audit Patient Identifiers](#)
[View Quick Reports](#)
[Manage Global Properties](#)
[View Server Log](#)
[View Database Changes](#)
[Find Patients Who Are Users](#)
[Data Entry Statistics](#)

Modules

[Manage Modules](#)
[Module Properties](#)

MRN Generator Module

[Bulk Identifiers Generator](#)
[ID Generator Setup](#)

Notifiable Condition Detector

[Dashboard](#)
[Manage Alerts](#)
[Manage Codes](#)
[Manage Code Systems](#)
[Manage Code Types](#)
[Manage Conditions and Groups](#)
[Manage Decided Results](#)
[Manage Errors](#)
[Manage HL7 Producers](#)
[Manage Institutions](#)
[Manage NLP Critic Concepts](#)
[Manage NLP Critic Contexts](#)
[Manage NLP Discrete Terms](#)
[Manage Reportable Results](#)
[Manage Scheduled Reports](#)

HTML Form Entry

[Preview HTML Form from File](#)
[Manage HTML Forms](#)

Reports

[Run Reports](#)
[Manage Reports](#)
[Manage Report Macros](#)
[Manage Data Exports](#)
[Manage Row Per Obs Data Exports](#)
[Manage Cohorts](#)
[Manage Patient Searches](#)
[Manage Report Elements](#)

Form Entry

[Upload an XSN](#)
[Manage Form Entry Error Queue](#)
[Form Entry Information](#)
[***Form Entry Archive Migration Needed***](#)

Dashboard / Results Query

Manage Reportable Results

Search Criteria

- Condition Name = Influenza
- Message Received Date/Time On or After 9/1/09 12:02 AM
- Rows per Page = 100
- Max Rows to Fetch = 1000

[Change](#)



Matching Reportable Results

[Refresh](#) [Select All](#) [Select None](#) [Modify Selected...](#) [Export...](#)

☐	Date/Time Received	MPQ Sequence Number	LOINC	Condition Reported	Decided By
☐	2009-09-21 17:56:50.0	518545058	31859-2	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-21 14:38:16.0	518429778	31859-2	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-21 14:33:40.0	518422730	31859-2	Influenza	NLP Critic - Discrete Analyzer
☐	2009-09-21 07:11:11.0	518290743	31859-2	Influenza	Decided Result: Abnormal Flag Critic
☐	2009-09-21 07:10:53.0	518290735	31859-2	Influenza	Decided Result: Abnormal Flag Critic
☐	2009-09-21 01:48:25.0	185849283	5862-8	Influenza	NLP Critic - Discrete Analyzer
☐	2009-09-20 19:26:00.0	185838611	5862-8	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-20 14:29:17.0	185830912	5862-8	Influenza	NLP Critic - Discrete Analyzer
☐	2009-09-20 13:29:15.0	518230062	5229-0	Influenza	Decided Result: NLP Critic - Numeric Analyzer
☐	2009-09-20 02:02:53.0	185808218	5862-8	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-19 20:00:28.0	185793353	5862-8	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-19 19:59:53.0	185793303	5862-8	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-19 19:29:32.0	185789800	5862-8	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-19 19:29:21.0	185789799	5862-8	Influenza	Decided Result: NLP Critic - Discrete Analyzer
☐	2009-09-19 19:28:15.0	185789732	5862-8	Influenza	NLP Critic - Discrete Analyzer

Messages / Segments Processed

	All Dates	9/22/09	9/21/09	9/20/09	9/19/09	9/18/09
Potentially Reportable	2116509	379	191284	61408	76435	148639
Decided Results +	4449	6	202	47	90	125
Decided Results -	177382	4	4849	2459	3021	4791
Critic +	5013	0	262	97	123	230
Critic -	1938812	373	186202	58865	73289	143655
Indeterminate +	0	0	0	0	0	0

[Reset Counts](#)

Managing Data Sources


Currently logged in as Super User | [Log out](#) | [My Profile](#) | [Help](#)

[Home](#) | [Find/Create Patient](#) | [Dictionary](#) | [Cohort Builder](#) | [Administration](#)

201-300 of 1,126 matching records shown.

Manage HL7 Producers

[Refresh](#)
[First Page](#)
[Previous Page](#)
[Next Page](#)
[Last Page](#)
[Add an HL7 Producer...](#)

Application ↑	Facility	Location	Description	Institution
BULK_LOADER	CLARIAN		Clarian Health Partners Bulk Loader	Clarian Health Partners
BULK_LOADER	IUMG		IUMG Group Bulk Loader	IUMG Group
BULK_LOADER	MARION COUNTY		Marion County Health Dept Bulk Loader	Marion County Health Dept
BULK_LOADER	ST FRANCIS	^^^ST FRANCIS M ER	St. Francis Hospital and Health Centers, Mooresville	St Francis Hospitals
BULK_LOADER	Wellpoint Medicaid		Wellpoint Medicaid Bulk Loader	Wellpoint Medicaid
BULK_LOADER	M-Plan		M-Plan Insurance Bulk Loader	M-Plan Insurance
BULK_LOADER	MACL		MACL Labs Bulk Loader	MACL Labs
BULK_LOADER	ST FRANCIS	^^^ST FRANCIS ER	St. Francis Hospital and Health Centers, Beech Grove	St Francis Hospitals
BULK_LOADER	INPC		SPIN Indianapolis Hospital Systems Bulk Loader	SPIN Indianapolis Hospital Systems
BULK_LOADER	St Johns		St Johns Health System Bulk Loader	St Johns Health System
BULK_LOADER	IN Medicaid		INDIANA MEDICAID Bulk Loader	INDIANA MEDICAID
BULK_LOADER	Mercy		St Vincent Mercy Hospital Bulk Loader	St Vincent Mercy Hospital
BULK_LOADER	NORTHWEST RAD		Northwest Radiology Bulk Loader	Northwest Radiology
BULK_LOADER	Anthem		Anthem Insurance Bulk Loader	Anthem Insurance
BULK_LOADER	IHIE		IHIE Bulk Loader	IHIE
BULK_LOADER	West Central		West Central Community Hospital Bulk Loader	West Central Community Hospital
BULK_LOADER	HENDRICKS		Hendricks Community Hospital Bulk Loader	Hendricks Community Hospital
BULK_LOADER	ST VINCENT		St Vincent Hospitals Bulk Loader	St Vincent Hospitals
BULK_LOADER	HANCOCK		Hancock Regional Hospital Bulk Loader	Hancock Regional Hospital
BULK_LOADER	AHN		American Health Network Bulk Loader	American Health Network
BULK_LOADER	St Joseph		St Joseph Hospital Bulk Loader	St Joseph Hospital
BULK_LOADER	COMMUNITY		Community Hospitals Bulk Loader	Community Hospitals
BULK_LOADER	CPI		Community Physicians of Indiana Bulk Loader	Community Physicians of Indiana
BULK_LOADER	METH SPORTS		Methodist Sports Medicine Bulk Loader	Methodist Sports Medicine
BULK_LOADER	MAJOR		Major Hospital Bulk Loader	Major Hospital
BULK_LOADER	MMG		Methodist Medical Group Bulk Loader	Methodist Medical Group
BULK_LOADER	D4D		DOCS4DOCS Bulk Loader	DOCS4DOCS
CA	SVHCI		St Vincent Heart	Bypass

English (United Kingdom) | [português](#) | [English \(United States\)](#) | [Italiano](#) | [français](#) | [español](#)
Last Build: Sep 14 2009 01:34 PM Version: 1.5.0 Build 10342

Manage Conditions and Groups

Conditions

Condition Name *

Condition Group

Reportable ☒

Requires Manual Review ☐

Report All ☐

Retired ☐

Add a Related Code

Code * System Indicator

Related Codes

Code	Code System	Code Name	Condition Indicator
☐ 5055-9	LN	B anthracis Ab Ser HA-aCnc	Positive
☐ 5055-9	LN	B anthracis Ab Ser HA-aCnc	
☐ 7814-7	LN	B anthracis Ab Ser-aCnc	Positive
☐ 7814-7	LN	B anthracis Ab Ser-aCnc	
☐ 11467-8	LN	B anthracis Ab Ser IB-aCnc	Positive
☐ 11467-8	LN	B anthracis Ab Ser IB-aCnc	
☐ 11468-6	LN	B anthracis Ab XXX IF-aCnc	Positive
☐ 11468-6	LN	B anthracis Ab XXX IF-aCnc	
☐ 11469-4	LN	B anthracis XXX QI Cult	Bacillus anthracis
☐ 11469-4	LN	B anthracis XXX QI Cult	
☐ 22109-3	LN	B anthracis Ab XXX-aCnc	Positive
☐ 22109-3	LN	B anthracis Ab XXX-aCnc	

Reports and Data Exports

 **OPENMRS** Currently logged in as Super User | [Log out](#) | [My Profile](#) | [Help](#)

[Home](#) | [Find/Create Patient](#) | [Dictionary](#) | [Cohort Builder](#)

Add a Report

* denotes a required field

Common Settings

Report Name *

Description

Start Time *

Repeat Interval *

Enabled ☐

Report Type

- ✓ Aggregate Summary Report
- Daily Report
- Data Source Report
- Reportable Result Export
- Unusual Condition Rate Report
- Zero Count Condition Report

Aggregate Summary Report Settings

Data Extractor

Cutoff Date/Time

Column Count

Report Title

Aggregate Summary Report

12:00 AM TO 03:00 PM	12:00 AM TO 11:59 PM	12:00 AM TO 11:59 PM	12:00 AM TO 11:59 PM	
Cases	Cases	Cases	Cases	Condition
-----	-----	-----	-----	-----
GENERAL INFECTION:				
1	1	0	0	Enterococcus, Vancomycin-resistant
3	1	1	6	Staphylococcus, Methicillin-resistant
0	0	0	2	Giardiasis
0	2	4	0	Hepatitis A
0	1	0	0	Hepatitis B

STD:					
7	29	7	16	Chlamydia infection	
1	0	0	5	Genital warts	
2	9	2	6	Gonorrhea	
0	2	1	0	Herpes simplex	
1	0	5	2	Syphilis	
0	0	1	2	Trichomoniasis	

0	2	1	0	Herpes simplex	
1	0	5	2	Syphilis	
0	0	1	2	Trichomoniasis	
VACCINE PREVENTABLE:					
2	3	2	1	Chickenpox	
2	1	0	0	Haemophilus influenzae	
3	0	1	0	Measles	
0	0	3	0	Pertussis	
0	0	0	1	Poliomyelitis	
0	0	1	0	Rubella	
LEAD:					
10	58	10	14	Lead exposure	
POISONINGS:					
3	5	2	1	Carboxyhemoglobin levels	
RESPIRATORY:					
0	1	0	0	Fifth's disease	
TB:					
1	0	1	1	AFB Undetermined	

Ongoing Work: Pre-populated Forms and Leveraging HIE data Repository

DOCS4DOCS®

General

Inbox
Inbox History
Report Search
Change Practice
System Messages
Dead Ltr Summary
Document Track
Delivery Status
Message Status
Help
Logout

Practice Admin

Users
Providers
Subscriptions
Default Subscriptions

Administrative

User Add
User Edit/Remove
Clin Mstr Search/Edit
Clin Mstr Add
Practice Add
Practice Edit
Practice Delete
HL7 Delvry Agnt
Services

System Message Edit
Dead Ltr Summary
HL7 Exceptions
User Alias Pools
Status Commands
Misc Commands
Audit Commands
Implementations
Help

Maintainer

Misc Commands

Contains commands for working with the selected item



CONFIDENTIAL REPORT OF COMMUNICABLE DISEASES

State Form 43823 (R2 / 11-96)

THIS FORM CONTAINS CONFIDENTIAL INFORMATION PER 410 IAC 3.1-2-18.

DISEASE

CHLAMYDIA

Name (last, first, m.i.) LABTESTING, HARRY M		
If child, name of parent (last, first, m.i.) BUNNY, BUGS Z		
Address (number and street) 1 MAIN STREET		Telephone number (765) 555-1212
City, ZIP code MAYBERRY, 46299		(Not Required For STD's) Check all that apply: ☐ Health Care Worker ☐ Food Service ☒ School (student / staff) ☐ Day Care (attende / staff)
County Marion		
Date of birth (month, day, year) 11 12 2005	Age 3	Name of school / day care? Part of an outbreak? ☐ Yes ☐ No ☐ Unknown
SEX ☒ Male ☐ Female	RACE ☐ White ☐ Black ☐ Unknown ☒ Other _____ ☐ Multi-Racial	
ETHNICITY ☒ Hispanic ☐ Non-Hispanic ☐ Unknown		
Etiologic agent		
Site of infection		
Date of diagnosis (month, day, year)		
Stage (syphilis only)		
Symptoms associated with infection? ☐ Yes ☐ No ☐ Unknown		
IF YES	(Not Required for STD's) Onset date (month, day, year)	Died? ☒ Yes ☐ No
Pertinent symptoms, signs:		
Lab test(s) and result(s) CHLAMYDIA BY RIA - POSITIVE		Date(s) 11 05 2008
Treatment (name of antibiotic)		Dosage
Antibiotic resistance? ☐ Yes ☐ No ☐ NOT DONE		Date initiated
If Yes, what antibiotic?		
Reporting Facility Code (see other side for codes) ST01W		If hospital, name of hospital
Name of physician and address FLINTSTONE, FRED		Record number
1001 W. 10th STREET, INDIANAPOLIS, IN 46205		Person reporting (other than physician)
Telephone number		Telephone number
Date of report		Check here if you need more cards ☐
LOCAL HEALTH DEPARTMENT USE ONLY		
Date received (month, day, year)		Follow-up initiated? ☐ Yes ☐ No
Name of investigator		

DISTRIBUTION: White - Indiana Department of Health; Canary - Local Health Office; Pink - Reporter

DOCUMENT INBOX»INBOX REVIEW

LAMYDIA

number
) 555-1212

Not Required For STD's)

Check all that apply:

Health Care Worker

Food Service

School (student / staff)

Day Care (attende / staff)

100%



Concluding Remarks: Where to Next?

- Notifiable condition surveillance
 - Apply principles of near real-time syndromic
- New tools to manage/analyze this information to support public health, research, ... (covariate analysis, etc.)
- Evolving process/culture: PH entities traditionally managed such data; how to evolve in the face of increasing electronic data, HIE, etc.?

Concluding Remarks

- When contemplating building public health case reporting systems, please consider the following:
 - Be able to clearly answer the question, “To what problem is the proposed technology the solution?”
 - Our answer to that question is we are addressing the well known problem of clinical underreporting by unencumbering providers from having to make the initial report to PH by building automated detection systems
 - Further, where possible, avoid asking the health care system to provide more data before making the most out of the data already generated

Concluding Remarks

- While defining transactional standards (e.g., a CDA based reporting guides) is necessary, so too is establishing consensus on the nature of the problems we face regarding PH reporting
- If we lack consensus and clarity on the problem we aim to solve, progress toward solutions will be slow
- There currently seems to be reasonable discussion regarding transaction formats, reporting ontologies, etc., but there seems to be less focus on discussing the pain points related to detection and reporting processes

Concluding Remarks – Pain Points

- Information generated in clinical care is highly variable and often incomplete
 - Variations differ across organizations
 - Variations differ across time within organizations
- Far less than half of physicians have a fully functional EHR system
- Clinical care processes under-report to public health (Thacker)
 - Reporters overburdened/under-resourced
 - Reporters lack knowledge, willingness
 - Clinical data is scattered across disparate settings
- Reporting requirements vary over time and geography

Concluding Remarks

- Build systems that recognize and accommodate data variation and incompleteness
- Build systems that can leverage many data sources (e.g., labs, EHR's, transcription, billing, radiology, etc.) -- not just one
- Recognize that clinical processes underreport and so either:
 - Address the reasons humans don't report
 - or
 - Un-encumber the human and begin to automate the process

Concluding Remarks

- The NCMT is crucial[†]
 - Maintaining up-to-date mappings between the test codes and the conditions for which the tests are reportable is a fundamental component of automated detection systems
 - Without a clear process for maintaining this key resource, automated case detection will not achieve its full potential

[†]Grannis S, Vreeman D. A Vision of the Journey Ahead: Using Public Health Notifiable Condition Mapping to Illustrate the Need to Maintain Value Sets. AMIA Annu Symp Proc. 2010: In Press.

Thank You for Your Time!

An Overview of Successful Large-Scale Automated Case Detection: Assisting Public Health with the Identification of Reportable Conditions

Shaun Grannis, MD, MS, FAAFP

The Regenstrief Institute

Indiana University School of Medicine

Indiana Center of Excellence in Public Health Informatics

Sept 2, 2010

icePHi
Indiana Center of Excellence
in Public Health Informatics



Regenstrief Medical Informatics
The **Source** for Medical Informatics