



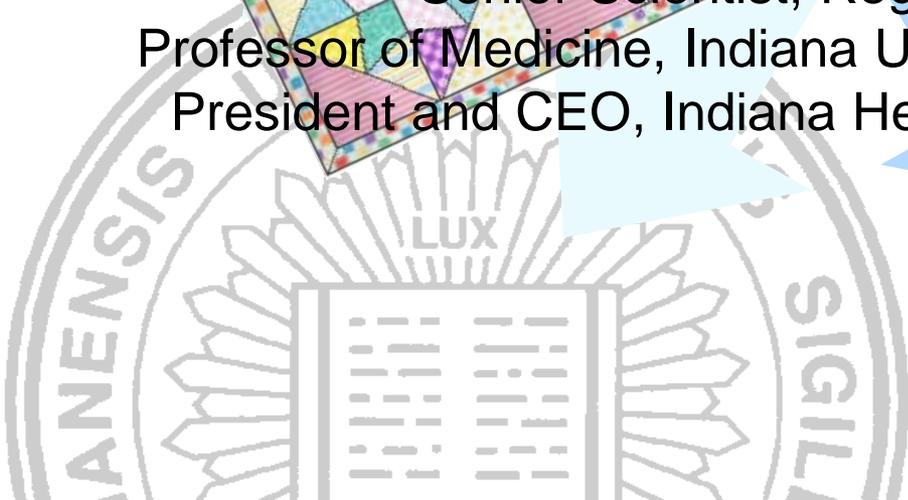
Funnels and Quilts

J. Marc Overhage, MD, PhD, FACMI, FACP

Senior Scientist, Regenstrief Institute

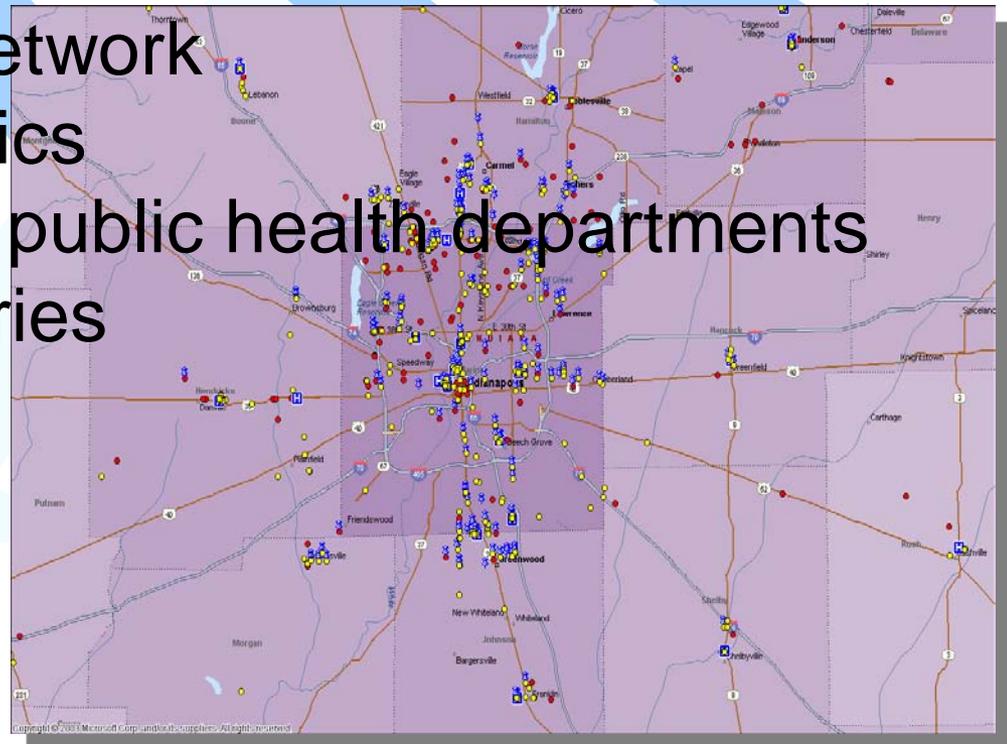
Professor of Medicine, Indiana University School of Medicine

President and CEO, Indiana Health Information Exchange



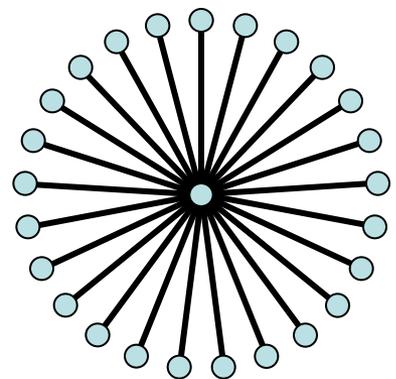
Participants

- “All” Indianapolis med/surg hospitals
- Physician offices
- Community health centers
- Homeless care network
- Public school clinics
- County and state public health departments
- National laboratories
- Public schools
- Pharmacies
- PBMs

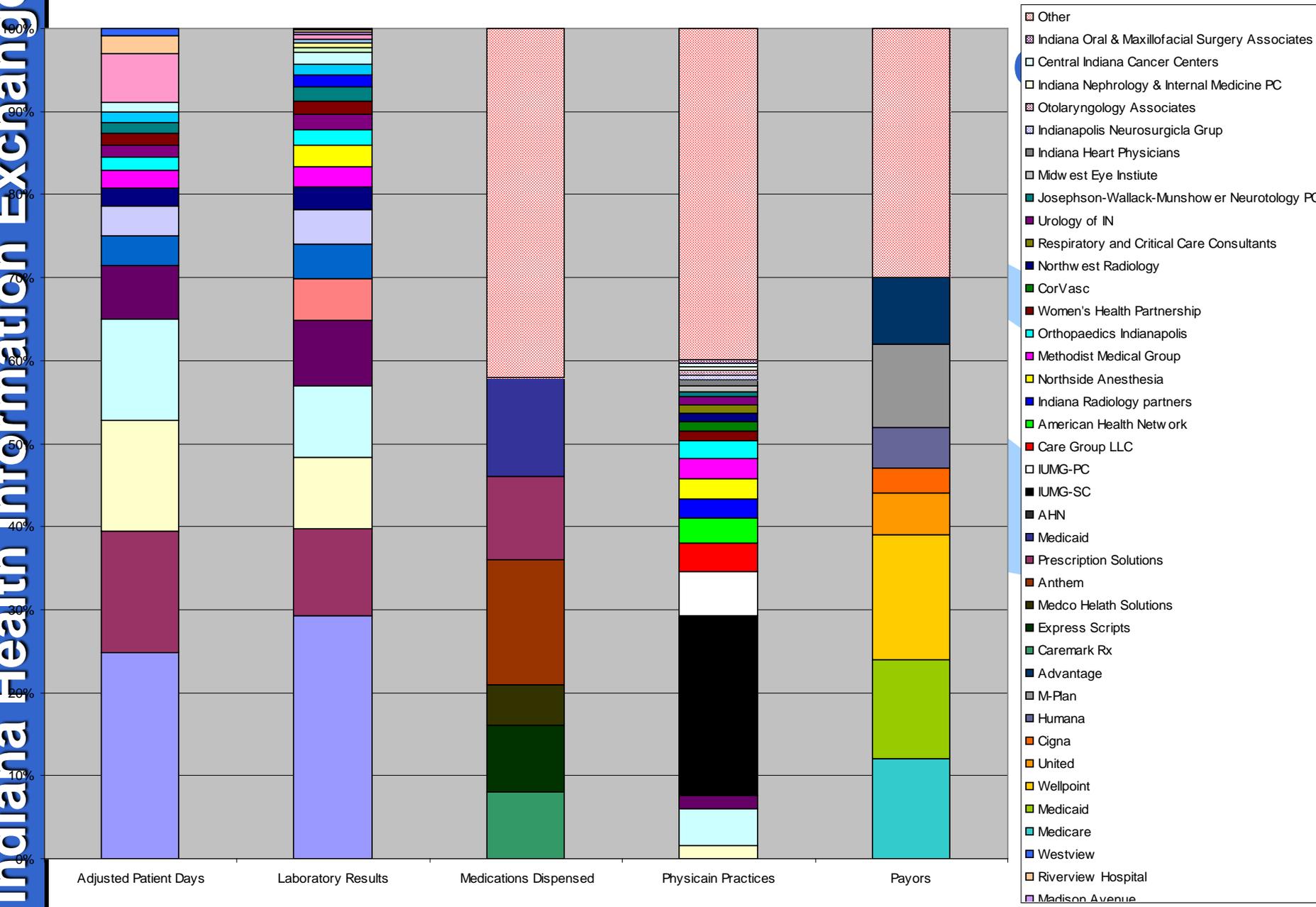


Data shared by all institutions

- All ED and outpatient visits
- All hospital discharges (dx, procedures)
- All inpatient laboratory results
- All outpatient laboratory results
- Immunizations
- All discharge summaries/admissions summaries
- All operative notes
- All radiology reports
- All surgical pathology reports
- Inpatient medications
- Tumor registry data



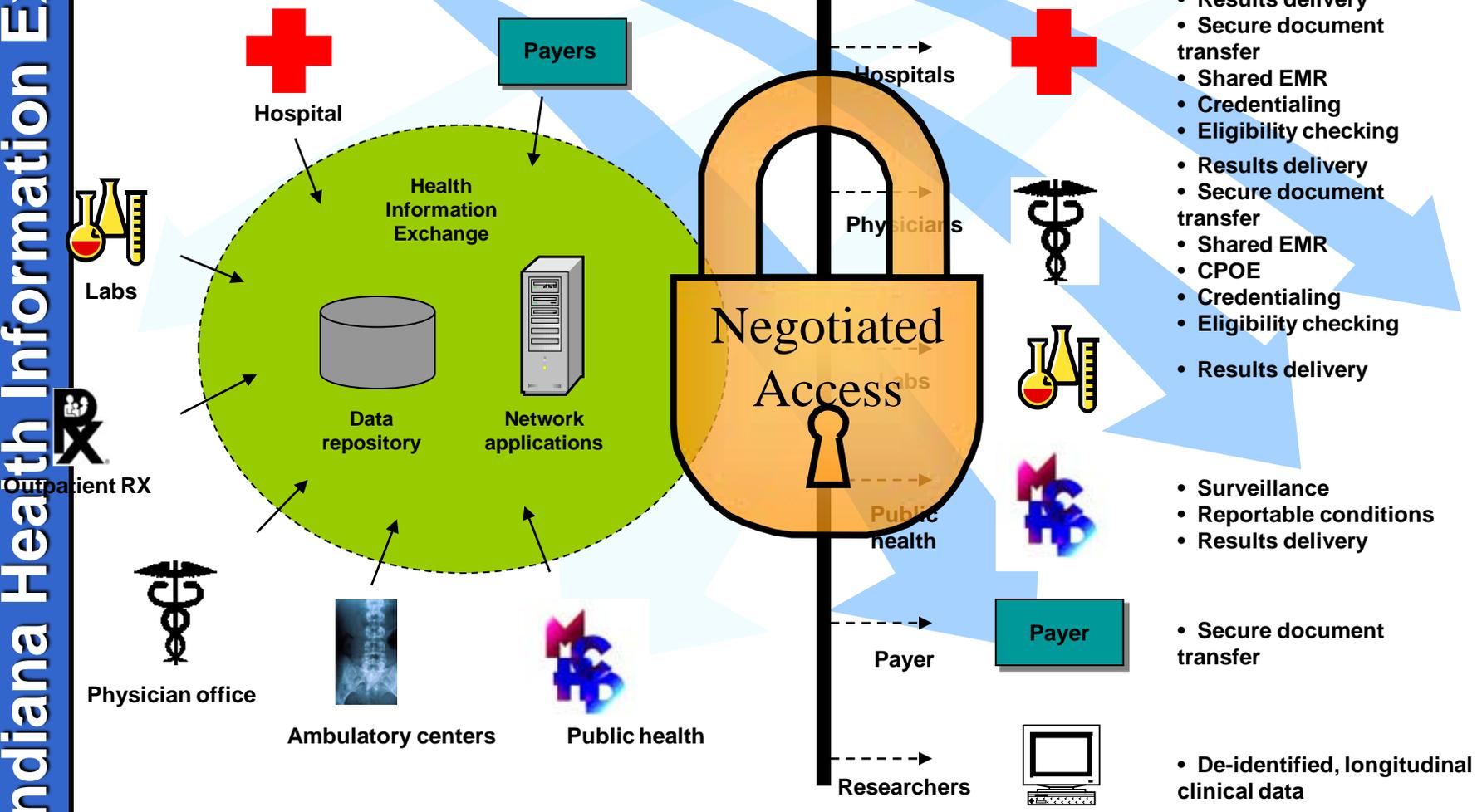
Indiana Health Information Exchange



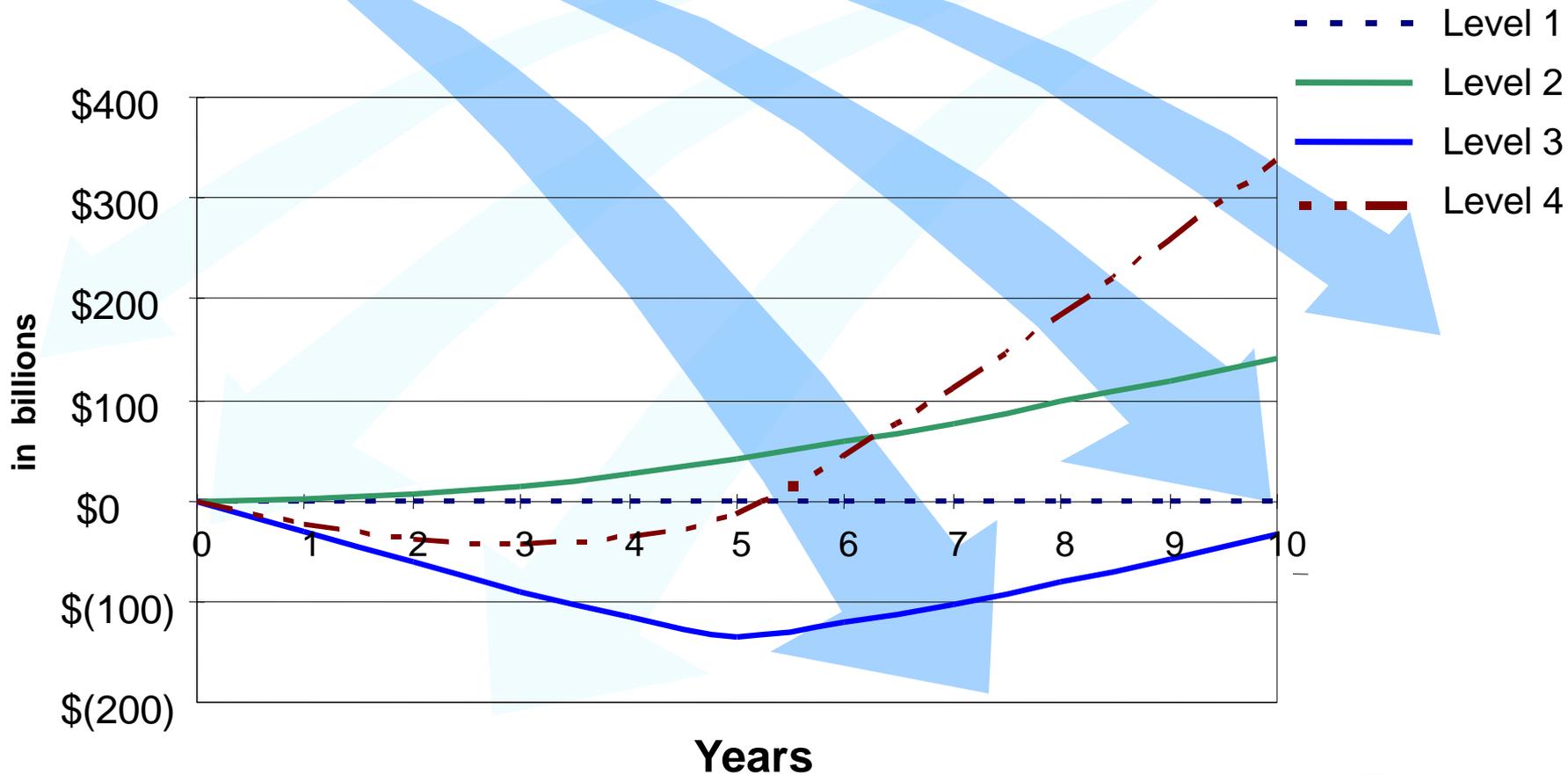
Data Reuse

Data management

Data access and use

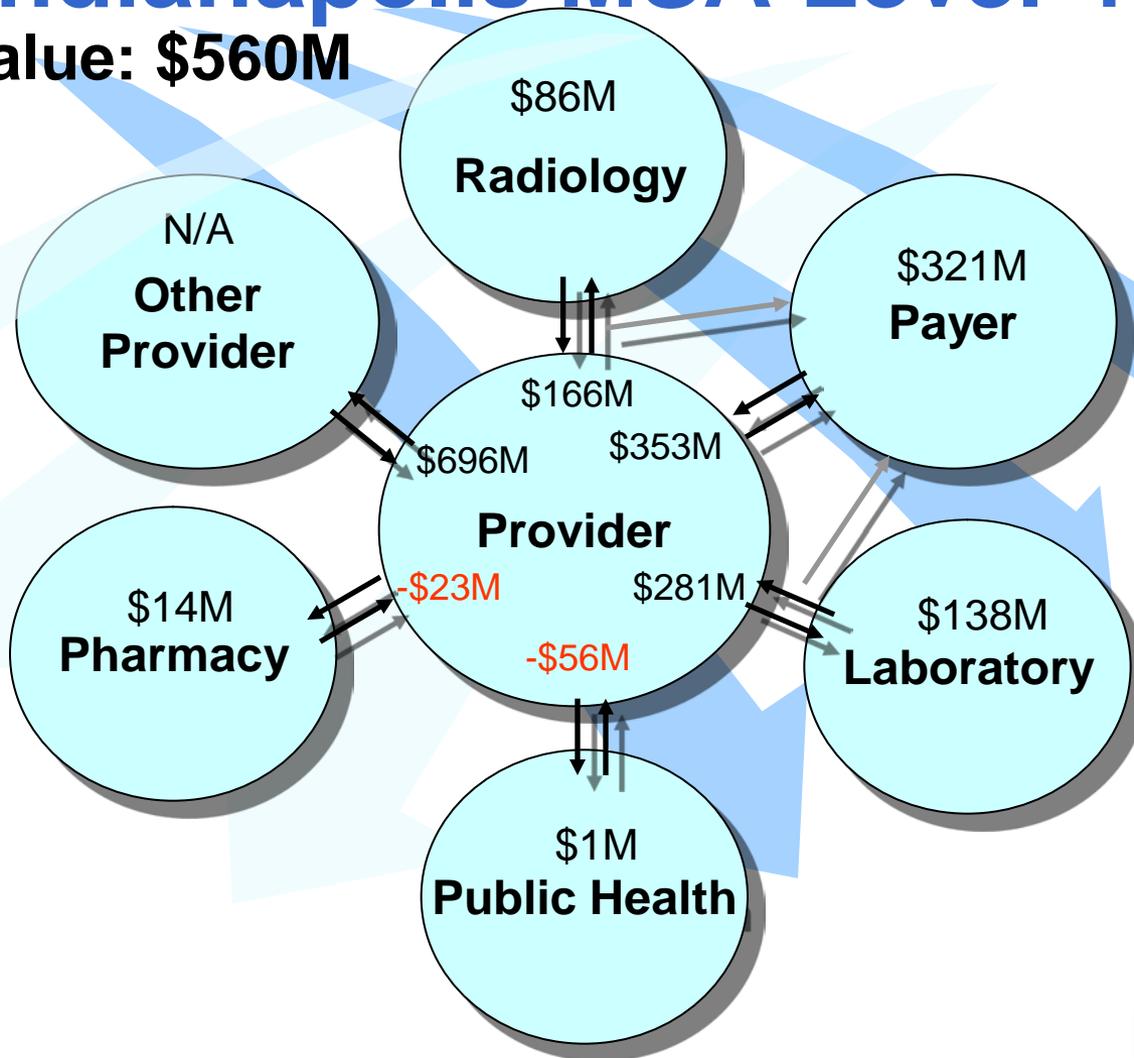


10-Year Cumulative Value

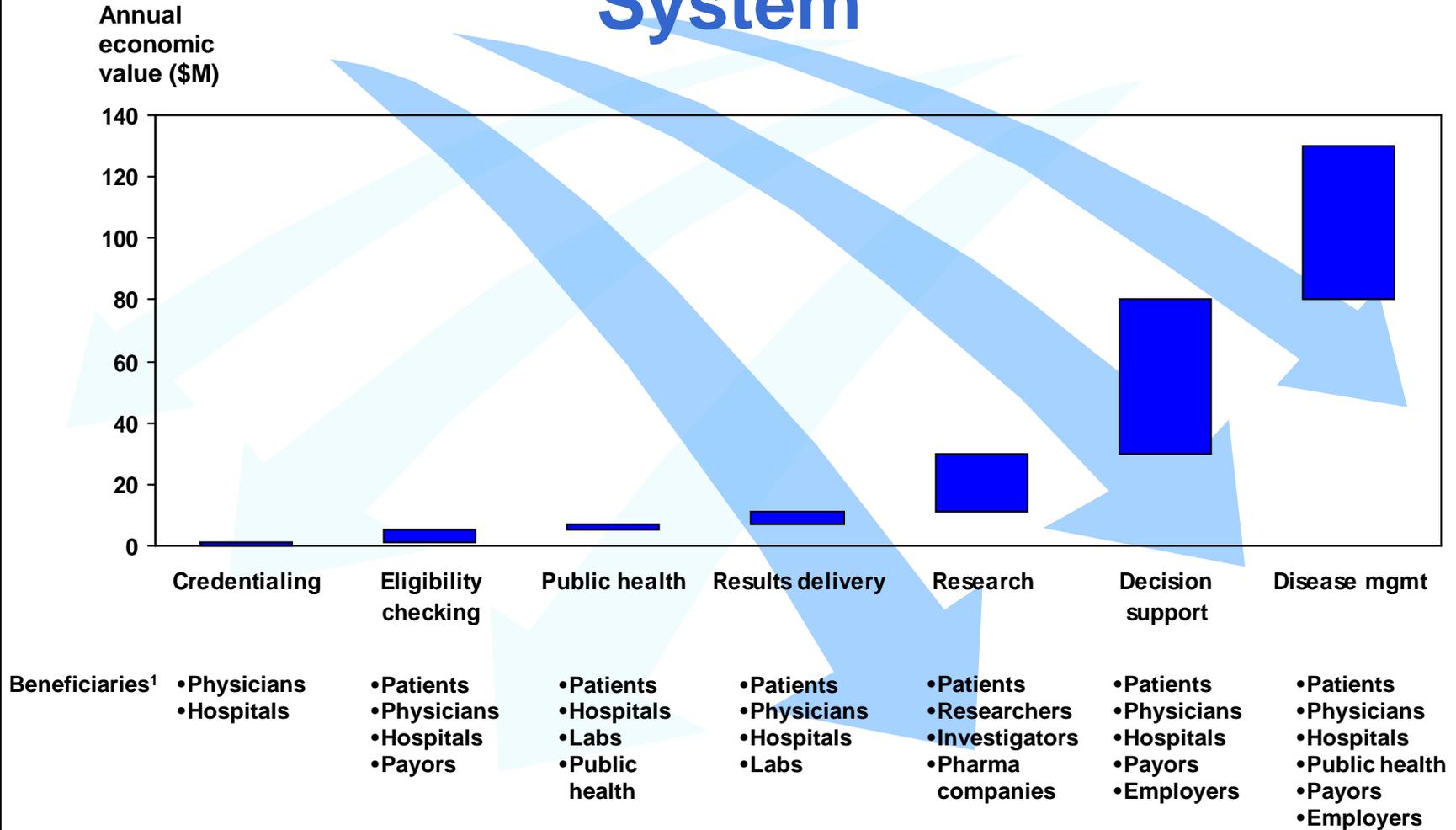


Annual Savings Indianapolis MSA Level 4

Total value: \$560M



Benefits Accrue to Stakeholders Across System



(1) Includes quality of care/other non-economic beneficiaries as well

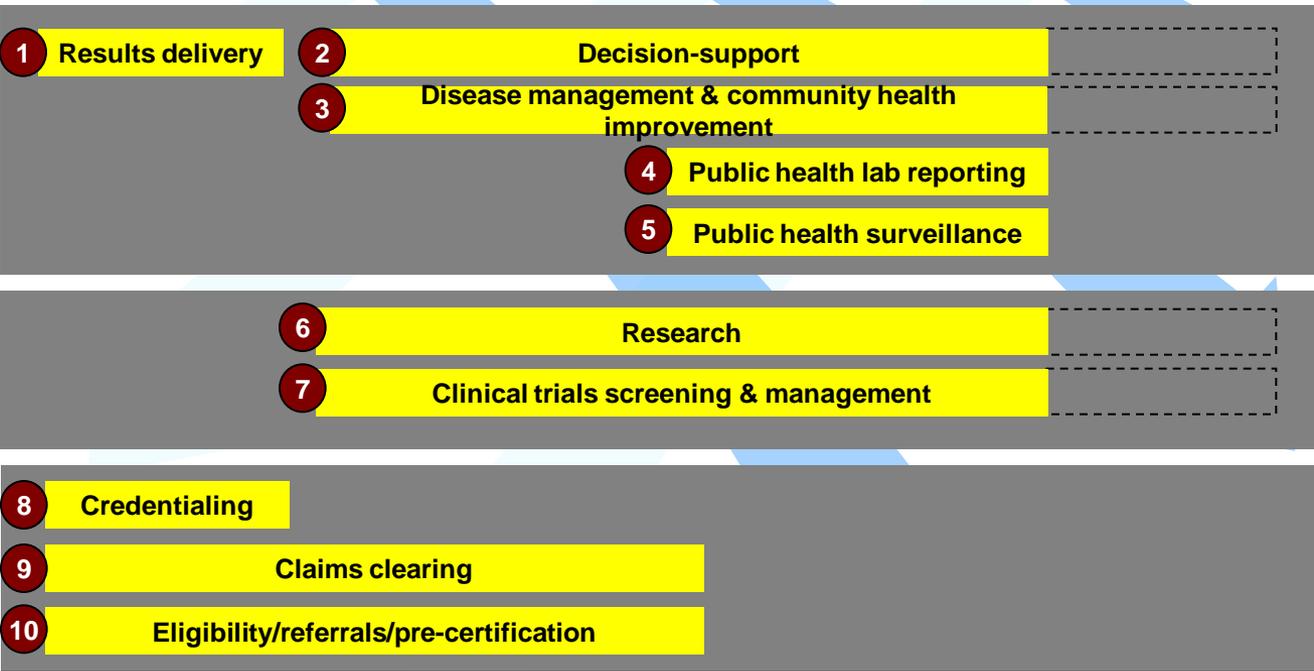
Sequencing

Increasingly structured clinical data →

Patient data



Applications & tools



Direct support of patient care

Research

Admin functions

Key question: How to orchestrate infrastructure build to target areas of highest value?

**Results Review
Doctor "pulls"**

comprehensive patient clinical data
No business model yet

Clinical Quality Services

"Push" results to providers and payors
Fee from payors per patient

Clinical Messaging

- "Push" results to the ordering and copy to providers
- Fee from source per message delivered, sliding schedule based on volume

Electronic Laboratory Reporting

"Push" reportable laboratory results to public health
No business model yet

Other

Syndromic Surveillance

"Push" encounter data to public health
Annual fee based on number of participating hospitals

Clinical Abstract

"Push" summary of patient's clinical data to doctor
No business model yet

Medication Reconciliation

"Push" medication history to hospital or practice
• Fee from hospital per medication history delivered

Clinical Research

Fee to researcher based on retrieval

Grants / Contracts

- Foundation
- Federal

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Web address: www.ihie.org



Backup Slides



DOCS4DOCS®

General
 Inbox
 Inbox History
 Report Search
 Change Password
 System Messages
 Help
 Logout

Smiley, Amanda (Docs4Docs/ASMILEY)
 Iumg - Pc Family Practice Center

Document INBOX

Holds all new documents.

Filters:

Actions:

	Provider	MRN	Patient Name	Arrival	Doc Type	Doc Details
<input type="checkbox"/>	Akosa Anthony N			2004 07/14 10:16 PM	Radiology (Clarian)	Xray Chest PA and Lateral
<input type="checkbox"/>	Akosa Anthony N			2004 07/14 10:16 PM	Radiology (Clarian)	Mammogram Screening Bilateral Digital DDI (Direct Digital Image)
<input type="checkbox"/>	Akosa Anthony N			2004 07/16 10:38 PM	Radiology (Clarian)	Xray Knee Standing
<input type="checkbox"/>	Akosa Anthony N			2004 07/16 10:38 PM	Radiology (Clarian)	Xray Foot 2 Views
<input type="checkbox"/>	Akosa Anthony N			2004 07/16 10:28 PM	Radiology (Clarian)	Xray Knee 3 Views
<input type="checkbox"/>	Akosa Anthony N			2004 07/14 10:16 PM	Radiology (Clarian)	Xray Chest PA and Lateral
<input type="checkbox"/>	Akosa Anthony N			2004 07/16 10:28 PM	Radiology (Clarian)	MR Brain - Head - Without then With Contrast
<input type="checkbox"/>	Akosa Anthony N			2004 07/08 03:11 PM	Radiology (Clarian)	Xray Abdomen KUB
<input type="checkbox"/>	Akosa Anthony N			2004 07/19 10:44 PM	Radiology (Clarian)	Xray Elbow
<input type="checkbox"/>	Akosa Anthony N			2004 07/13 10:26 PM	Radiology (Clarian)	Xray Hand Min 3 Views
<input type="checkbox"/>	Akosa Anthony N			2004 07/15 10:37 PM	Radiology (Clarian)	Xray Chest PA and Lateral
<input type="checkbox"/>	Akosa Anthony N			2004 07/16 10:27 PM	Radiology (Clarian)	Xray Wrist AP and Lateral
<input type="checkbox"/>	Akosa Anthony N			2004 07/09 03:36 PM	Radiology (Clarian)	US Renal
<input type="checkbox"/>	Allen Deborah I			2004 07/12 05:31 PM	Radiology (Clarian)	Xray Spine Scoliosis AP and Lateral

DOCS4DOCS

General

- New Documents
- Document Archive
- Document Search
- Change Practice
- Change Password
- Help
- Logout

Practice Admin

- Add/Remove Users
- Add/Remove Providers
- Provider Subscriptions
- Subgroup Management

Administrative

- Add User
- Remove User
- Edit User
- Provider Master Entry
- Add Practice
- Edit Practice
- Remove Practice
- Email Reports
- System Status
- Intake Status
- Exception Editor
- Fax Status

XUE, JACK
LAB AUDIT

Bookmark

- Providers
 - BAELE, JOSEP
 - DALY, ROBERT
 - ROUGRAFF, BF
 - {Table of Contents}
- Patients
 - MKCHEMTEST1
 - MKFATPT1A,TE
 - MKFATPT1A,TE
 - MKHEMTEST1,
 - MKLABTEST1,T
 - MKNCH1,TESTM
 - MKROCHE,TES
 - MKROCHE,TES
 - {Table of Contents}

Bookmarks

Thumbnails

Signatures

Methodist Hospital
Department of Pathology and
Laboratory Medicine
1701 North Senate Boulevard
Indianapolis, IN 46206



Copy For: ROUGRAFF BRUCE

NAME: MKHEMTEST1,TESTMH
MRN: 0072272030
DOB: 09/10/1967 **SEX:** Female
HOME: (457) 349-9794

Date: Mon 02/23/2004 01:23 PM **Accession #**04-054-000014 **Account:** 000100010321
Ordered by: ROUGRAFF, BRUCE T **Location:** H RTP

*** Hemogram with Platelet Count ***

Procedure	Units	Ref Range
WBC	22.2 H k/cumm	[4.5-11.5]
RBC	3.23 L million/cumm	[4.00-5.40]
Hgb	9.8 L gm/dL	[12.0-15.0]
Hct	30.7 L %	[35.0-49.0]
MCV	95 H fL	[80-94]
MCH	30.3 pg	[26.0-32.0]
MCHC	31.9 L gm/dL	[32.0-36.0]
RDW	16.0 H %	[11.5-14.5]
Platelet	298 k/cumm	[150-450]
MPV	9.0 fL	[6.3-9.6]

All lab performed at Clarian/Methodist Lab 1701 N Senate Blvd Indpls, IN 46202

7 of 9 8.5 x 11 in

Patient Medication History: RxHub Patient Medication History Date: 12/07/2004

Patient Id: 2222 Name: SCHNUR, BERT L Address: 63050 DOB: 04/19/1945 Gender: Male

Medication History Date Range: 12/08/2003 - 12/07/2004

DISCLAIMER: Certain information may not be available or accurate in this report, including over-the-counter medications, low cost prescriptions, prescriptions paid for by the patient or non-participating sources, or errors in insurance claims information. The provider should independently verify medication history with the patient.

Summary:

Table with 5 columns: Drug Name, Oldest Fill Date, Most Recent Fill Date, #of Fills. Rows include DIGITEK 250 MCG TABLET, DIGITEK 125 MCG TABLET, and LANOXIN 50 MCG/ML ELIXIR.

Pharmacies:

Table with 2 columns: Key Reported Pharmacies, Pharmacy Phone. Rows include ADVANCERX.COM and WAL-MART #2514.

Key Reported Prescribers

A JEFFRIES, RHONDA

Detail Information:

Table with 7 columns: Fill Date, Qty, Days, Prescriber, Pharmacy, Source. Rows include DIGITEK 250 MCG TABLET (DIGOXIN) and DIGITEK 125 MCG TABLET (DIGOXIN).

Methodist Hospital
 Emergency Medicine and
 Trauma Center
 1701 North Senate Blvd
 Indianapolis, IN 46206

MEDICATION HISTORY



Name: Mkhemtest, mhtest
 MRN: 007222030
 DOB: 09/10/67 Sex: Female
 Home: (457) 348-9794

Date: Mon 05/22/2005 01:23 PM Visit: #04-054-000014 Account: 010001000234
 Attending: Rougraf, Bruce T Location: EMTC

PROPOXY-N/APAP 100-650 TAB

Dispensed: 2005-05-13 #16 at CVS PHARMACY 1518729



NITROGLYCERIN 0.4 MG/HR PTC ordered: AZ1044685

Dispensed: 2005-05-12 #30 at CVS PHARMACY 1518729



VERAPAMIL 240 MG TABLET SA ordered: AB1315200

Dispensed: 2005-05-04 #60 at CVS PHARMACY 1518729
 2005-03-28 #60
 2005-02-15 #60
 2005-01-13 #60

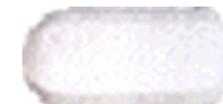
a light green,
 oblong, scored,
 film-coated tablet
 imprinted with
 "logo and logo"
 and "ST".



Medication Possession Ration 1.4

POTASSIUM CL 20 MEQ TAB SA ordered: AB1315200

Dispensed: 2005-05-03 #60 at CVS PHARMACY 1518729
 2005-03-28 #60
 2005-02-15 #60
 2005-01-13 #60



Full Screen
 Close Full Screen

LOVASTATIN 40 MG TABLET ordered by: BC5175535

Dispensed: 2005-04-29 #30 at CVS PHARMACY 1518729



INPC EMERGENCY CARE ABSTRACT

ER CHIEF COMPLAINT (no data found)		
HISTORY & PHYSICAL		
DX & COMPLAINTS	09-Dec-03	CONDYLOMA ACCUMINATUM ACTIVE pregnancy normal care wulva CA marked dysplasia [a] (a)From WISHARD, Wishard Appointment Scheduler), ICB, X999999-8 SAMPLE, INPC WISHARD)
E.R. DIAGNOSIS	07-Sep-89	bronchitis [a] (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD
ALLERGIES	12-Aug-03	DRUG ALLERGIES DARVOCTOL HYDROCODONE 5/ACETAMINOPHEN 500 [a] (a)From WISHARD, MMH Online Results, X999999-8 SAMPLE, INPC WISHARD
BLOOD TYPE	06-Aug-03	PRENATAL ABO RH group A (a) RH 069 (a) ANTIBODY SCREEN 069 (a) (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD
VITALS	08-Aug-03	INPATIENT VITALS WEIGHT AUTO 108.9 [a] lb TEMP AUTO ORAL 99.9*(a) [a] DSOP PULSE AUTO 75 [a] /MIN RESP RATE AUTO 20 [a] /MIN SYSTOLIC BP AUTO 103 [a] mm Hg DIASTOLIC BP AUTO 62 [a] mm Hg (a)From WISHARD, Wishard VITALSHT, X999999-8 SAMPLE, INPC WISHARD
CHEMISTRY	12-Aug-03	ELECTROLYTE REFL SODIUM 135 [a] mmol/L POTASSIUM 4.2 [a] mmol/L CHLORIDE 103 [a] mmol/L CO2-TOT 29 [a] mmol/L (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD
09-Aug-03	12-Aug-03	12-Aug-03
06-Aug-03	07-Sep-89	06-Aug-03
CHEMISTRY (continued)		
CHEM 16	12-Aug-03	CALCIUM 8.3*L [a] mg/dL PHOSPHORUS 2.4*L [a] mg/dL URIC ACID 3.0 [a] mg/dL CHOLESTEROL 151 [a] mg/dL PROTEIN-TOTAL 5.3*L [a] g/dL ALBUMIN 2.6*L [a] g/dL BILIRUBIN TOTAL 0.5 [a] mg/dL ALK PHOS 61 [a] UNITS/L SGOT (AST) 17 [a] UNITS/L SGPT (ALT) 30 [a] UNITS/L AMYLASE <30*L [a] UNITS/L (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD
HEMATOLOGY (continued)		
ROUTINE COAG	06-Aug-03	ROUTINE COAG WISHARD
CARDIOVASCULAR		
ECG	06-Aug-03	normal sinus rhythm, normal ECG [a] (a)From WISHARD, Wishard ECG, X999999-8 SAMPLE, INPC WISHARD
PRESCRIPTIONS		
RECENT MEDICATION HISTORY DIGITEX 250 MG TABLET 01-Aug-03 DIGITEX 125 MG TABLET 01-Jul-03 LANOXIN 50 MG/ML ELIXIR 01-May-03 From 2222 SCHMUR, BERT L		
HEMATOLOGY		
BLOOD CELL PROFILE	11-Aug-03	WBC 10.7 [a] k/cumm RBC 2.9*L [a] million/ HGB 10.1*L [a] g/dL HCT 30*L [a] % MCV 100*H [a] fL MCH 35*H [a] pg MCHC 34 [a] g/dL RDW 13.3 [a] % (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD
DIFFERENTIAL		
LYMPS	07-Sep-89	8*L [a] % MONO 8 [a] % PLT EST adeq [a] BASIS 3 [a] % MACROS 1000 [a] VACILLATED POLYS present [a] GIANT PLATELETS present [a] (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD
COMMON HEMATOLOGY STUDIES		
PLT CT	11-Aug-03	225 [a] k/cumm P.T. 12.0 [a] sec 16-Jun-85 (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD
09-Aug-03	12-Aug-03	06-Aug-03
ROUTINE COAG		
ROUTINE COAG	06-Aug-03	PROTIME (ISI) 10.5 [a] sec IMR 0.9 [a] APTT PATIENT 33 [a] sec (a)From WISHARD, X999999-8 SAMPLE, INPC WISHARD

This partial medical history contains confidential patient information. Unauthorized use is subject to disciplinary action. File in correspondence section of medical record. Mental health, STDs, drug and alcohol abuse data from this institution only. More on-line at INPC.ORG.

Data From: WISHARD - CLARIAN - MARION COUNTY

SAMPLE,INPC WISHARD #X999999-8

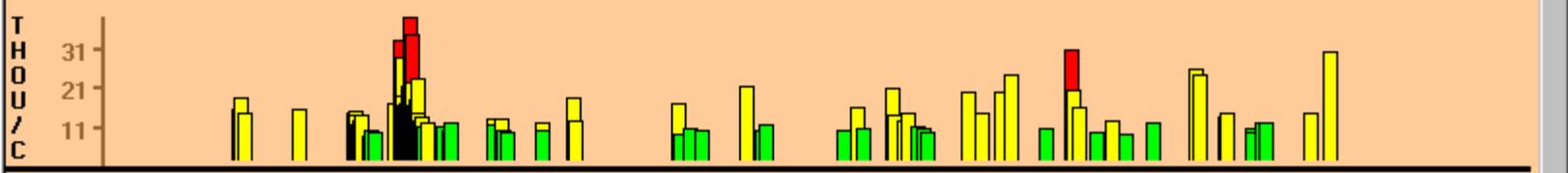
Printed 18-Feb-05 at WISHARD

- Chronologic Results
- Flowsheet
- Clinical Synopsis
- REPORTS
 - ALL REPORTS
 - Discharge Summaries
 - Miscellaneous
 - Operative
 - Pathology
 - Radiology
 - Face Sheet
 - Orders
- COUNTERS
 - Brief
 - Detailed
- PRESCRIPTIONS
 - Inpatient
 - Outpatient
 - Advance Directive
 - Surgery Log
 - nrf_inq_tst_one
 - echocardiogram

DEMO,JONATHAN DOE #99999999-8 @REGEN_DEVELOP M 57yr

Zoom Out Fully Zoom Out Zoom In Left Right Help

Up to Top Up One Down One Delete WBC #



STEP 1: Define cohort by selecting variables and the criteria they must meet

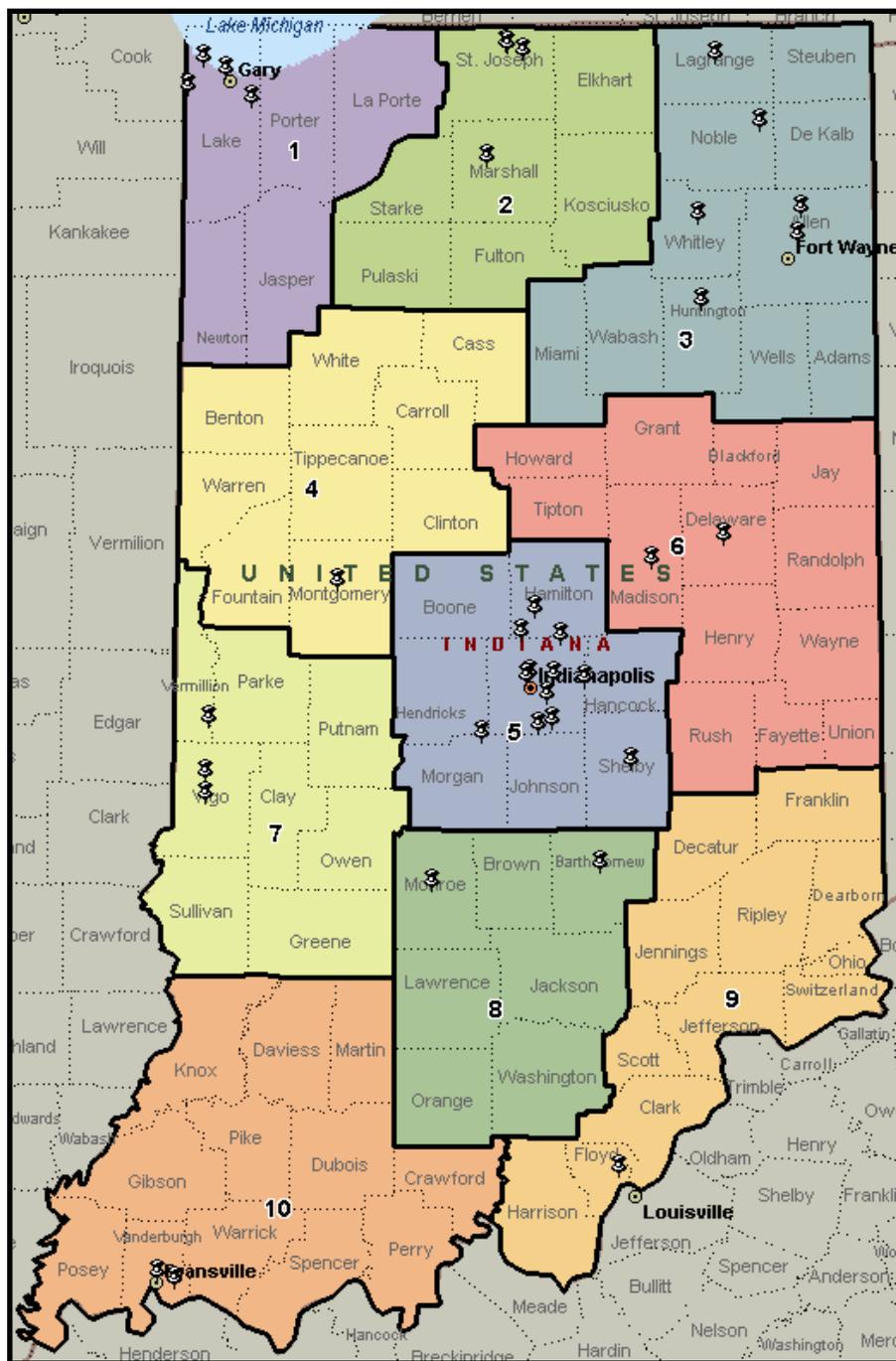
Pick the query variable you want or type in text from its name

Cancer relevant variables	# OBS	# PAT
Blood Bank Consult Report	3,782	3,438
FN Aspirate Report	36,391	30,289
Cytology Report	126,063	66,875
Gyn Cytology Report	604,611	257,587
Flow Cytometry	893	783
Surgical Pathology Rpt	1,031,818	585,078
Path report clinical Hx section - text	1,031,818	585,078
Path report gross section - text	1,031,818	585,078
Path report final diagnosis section - text	1,031,818	585,078
Path report final diagnosis section - coded	1,331,242	388,026
Path report comment section - text	1,031,818	585,078
Age at specimen collection	135,502	128,090
Admission Notes		
Discharge Summary	531,306	247,938
Visit Note	2,239,160	365,029
Radiology Report	3,475,220	433,841
Nuclear Med. Report		
Demographics		
Gender	4,712,257	4,712,257

Cohort definition	
A	True if any Gender exist
B	True if any Path report final diagnosis section - coded with codes of "stage IV Wilms' tumor' or 'blastema predominant Wilms' tumor' or 'recurrent Wilms' tumor' or 'stage II Wilms' tumor' or 'stage V Wilms' tumor' exist

- All conditions must be true (AND)
- Any conditions may be true (OR)
- Write the logic explicitly

A AND B



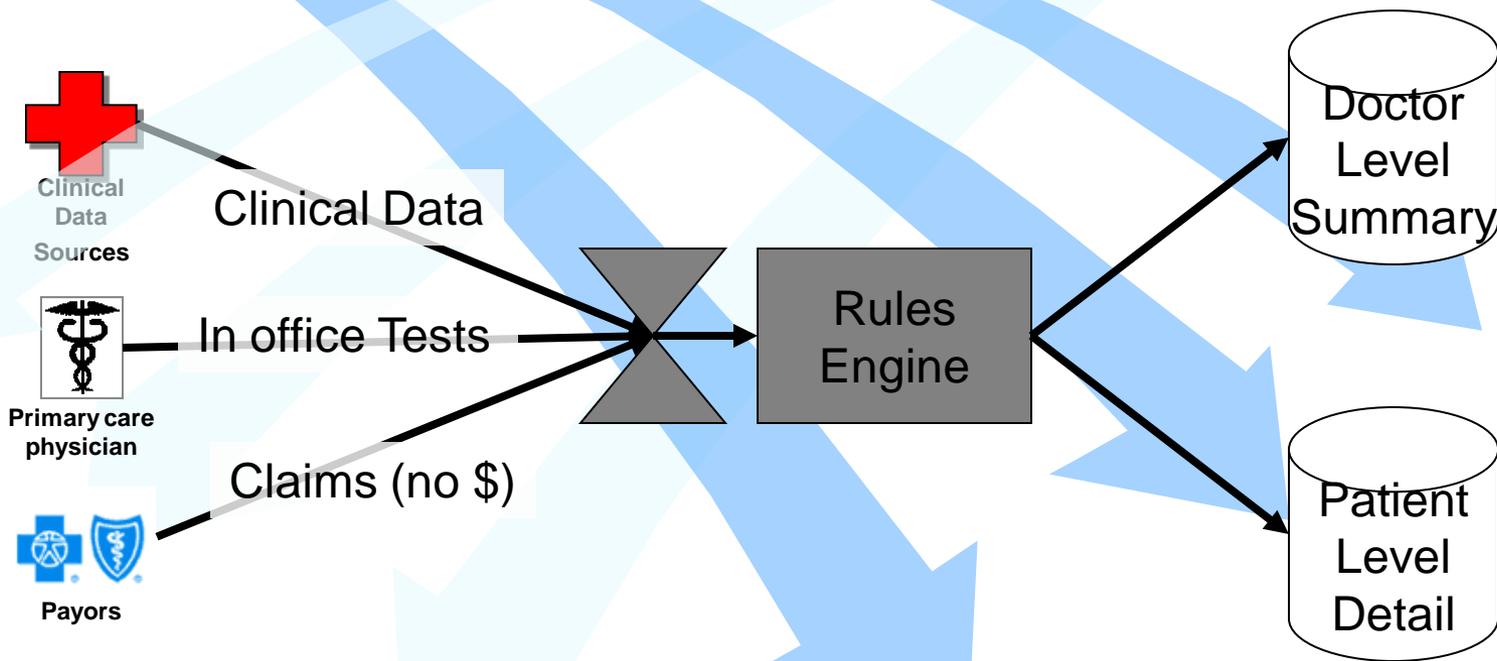
Public Health Emergency Surveillance System (PHESS)

- 56 Hospitals connected
- > 4,000 ED visits per day



**Indiana State
Department of Health**

Clinical Quality Data Services



Clinical Quality Data Services

- Improve quality of care
 - Improve efficiency of care
 - Broad involvement
 - >90% primary care providers
 - ≈900,000 lives
 - Expanding to other markets
 - Lafayette
 - Bloomington
 - Ft. Wayne
- 

File Edit View Run Help

row number	RACE (value)	Patient age (value)	Any Total survival (value)	full path report for breast and cancer (value)	truth value (exists)	ca 125 (value)	max Calcium SerPI-mCnc (value)	min Calcium SerPI-mCnc (value)	trut (va
72	Black	82.0	78.0			394.0	12.4	8.0	
143	Black	83.0	71.0			201.0	10.5	6.5	
90	Black	77.0	73.0			135.0	9.2	5.8	
31	Black	80.0	79.0	View Report	present	86.0	10.4	6.8	Vie
7	Black	55.0	53.0	View Report	present	42.0	10.3	7.8	Vie
166	White	71.0	62.0	View Report	present	22.0	10.0	8.2	Vie
91	White	60.0	59.0	View Report	present	7.0	10.0	8.0	Vie
123	Black	36.0	35.0	View Report	present		9.6	8.0	Vie
130	White	40.0	40.0	View Report	present		9.6	8.2	Vie
53	White	42.0	42.0	View Report	present		0.0	0.0	Vie

Print Export Create Report