COVID-19: Interoperability Rules of the Road...Better Data, Better Interoperability

October 23, 2020

HIMSS

Vision

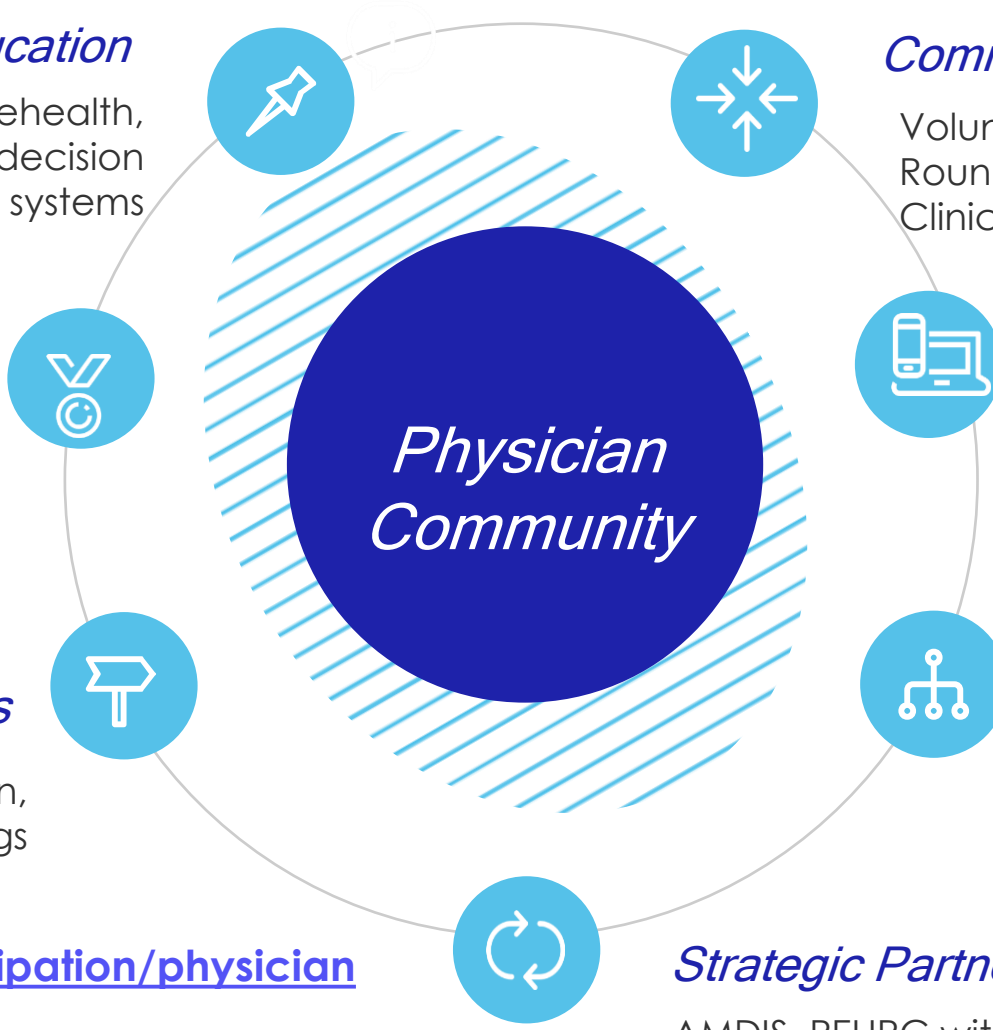
To realize the full health potential of every human, everywhere.

Mission

Reform the global health ecosystem through the power of information and technology.

HIMSS

Welcome



Education

Present webinars on telehealth, medical informatics, clinical decision support and best use of EHR systems

Community

Volunteer efforts include –CMIO Roundtable & Workgroups, Clinician Circle (ambassador)

Thought Leadership

Policy input, interviews with HIMSS Media; Pre-Con Symposium Planning

CMIOs

Value of CMIO; CMIO Roundtable

Physician Resources

Career profiles, education, articles, blogs

Education Task Force

Drive education and content for Community

Strategic Partners

AMDIS, PEHRC with CMSS, AHA, Heart Rhythm Society, AMA

www.himss.org/membership-participation/physician

HIMSS Interoperability & Health Information Exchange Community

- Connecting professionals committed to transforming health through standards-based interoperability and health information exchange

- A dynamic community for sharing ideas, learning best practices and leveraging collaborative opportunities

https://www.himss.org/membership-participation/communities

Join Today

HIMSS

Meet Our Speakers

Leslie Kelly Hall
Founder
Engaging Patient Strategy

Harm J. Scherpbier, MD, MS
CMIO
HealthShareExchange

Shaun J. Grannis, MD, MS
Vive President for Data and
Analytics, Regenstrief

Learning Objectives

- Discuss why complying to interoperability standards is a critical component in the timely and reliable transition of health information, particularly during the COVID-19 pandemic
- Highlight challenges with deploying standards in an effective way to inform care interventions
- Identify ways to encourage and enable healthcare provider organizations to improve on their data sharing practices
- Explore foundational interoperability principles which enable immediate improvements in data sharing and reporting capabilities

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How HIE Can Support COVID-19 Response

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Regenstrief Professor of Medical Informatics, IU School of Medicine
Professor of Family Medicine, IU School of Medicine
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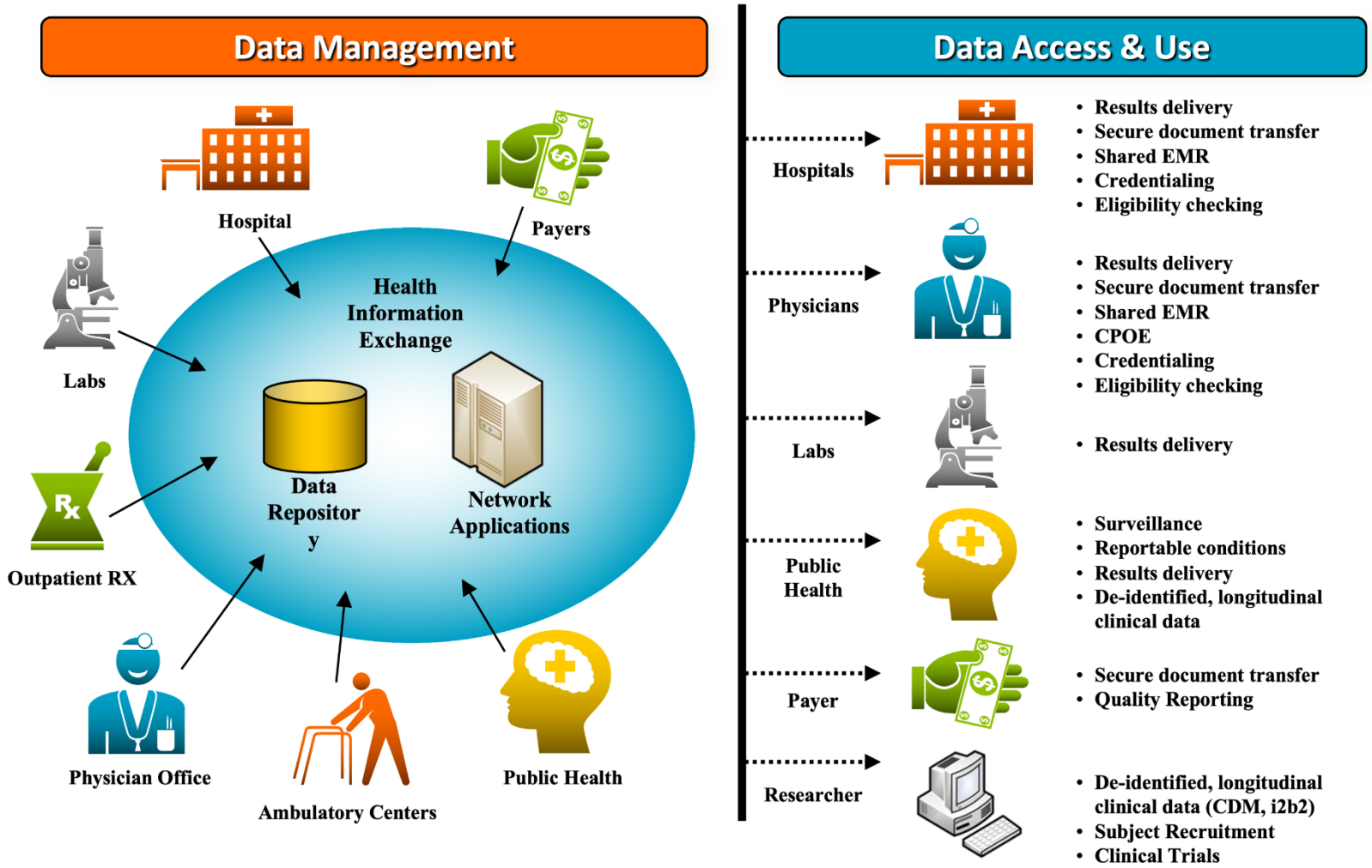
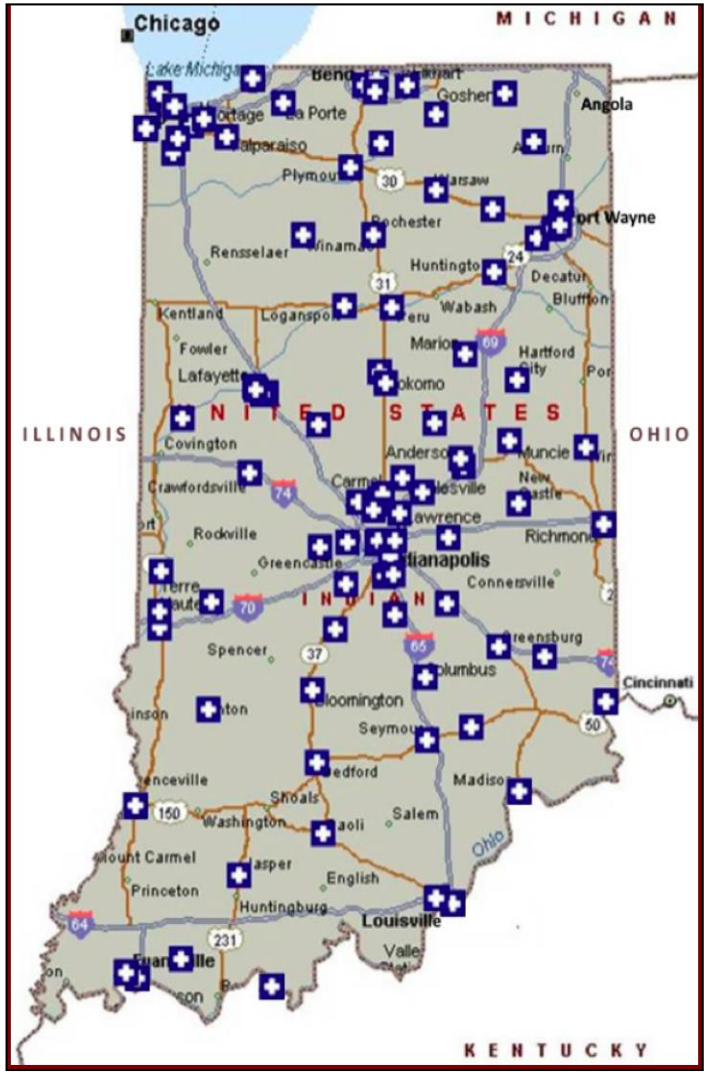
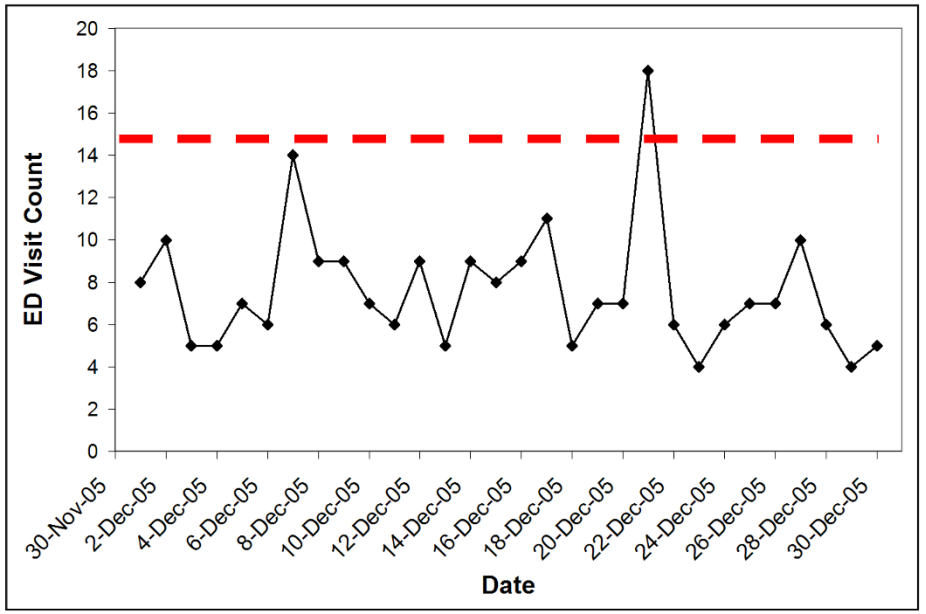
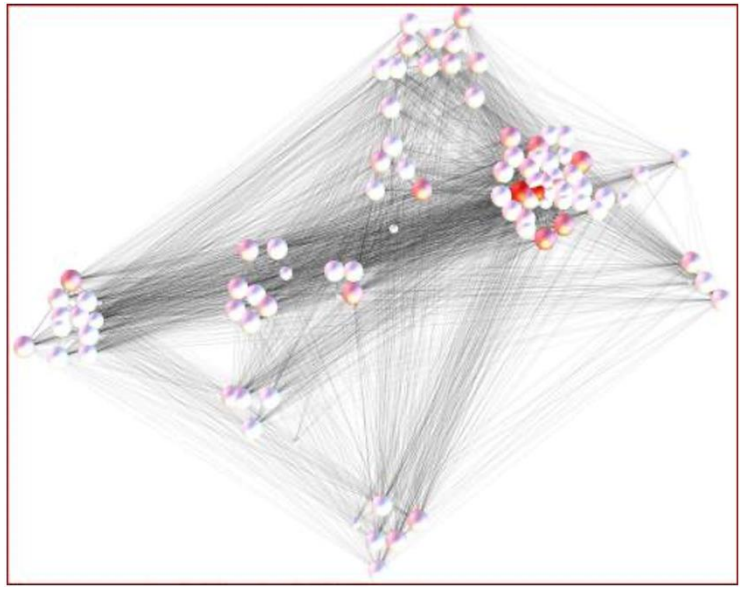
EHR Integration: The Indiana Network for Patient Care (INPC)



Surveillance → Predictive Modeling








Notifiable Condition
Detector

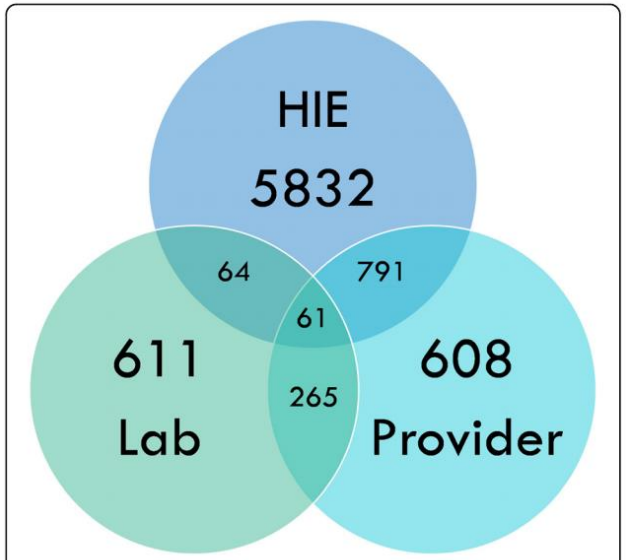


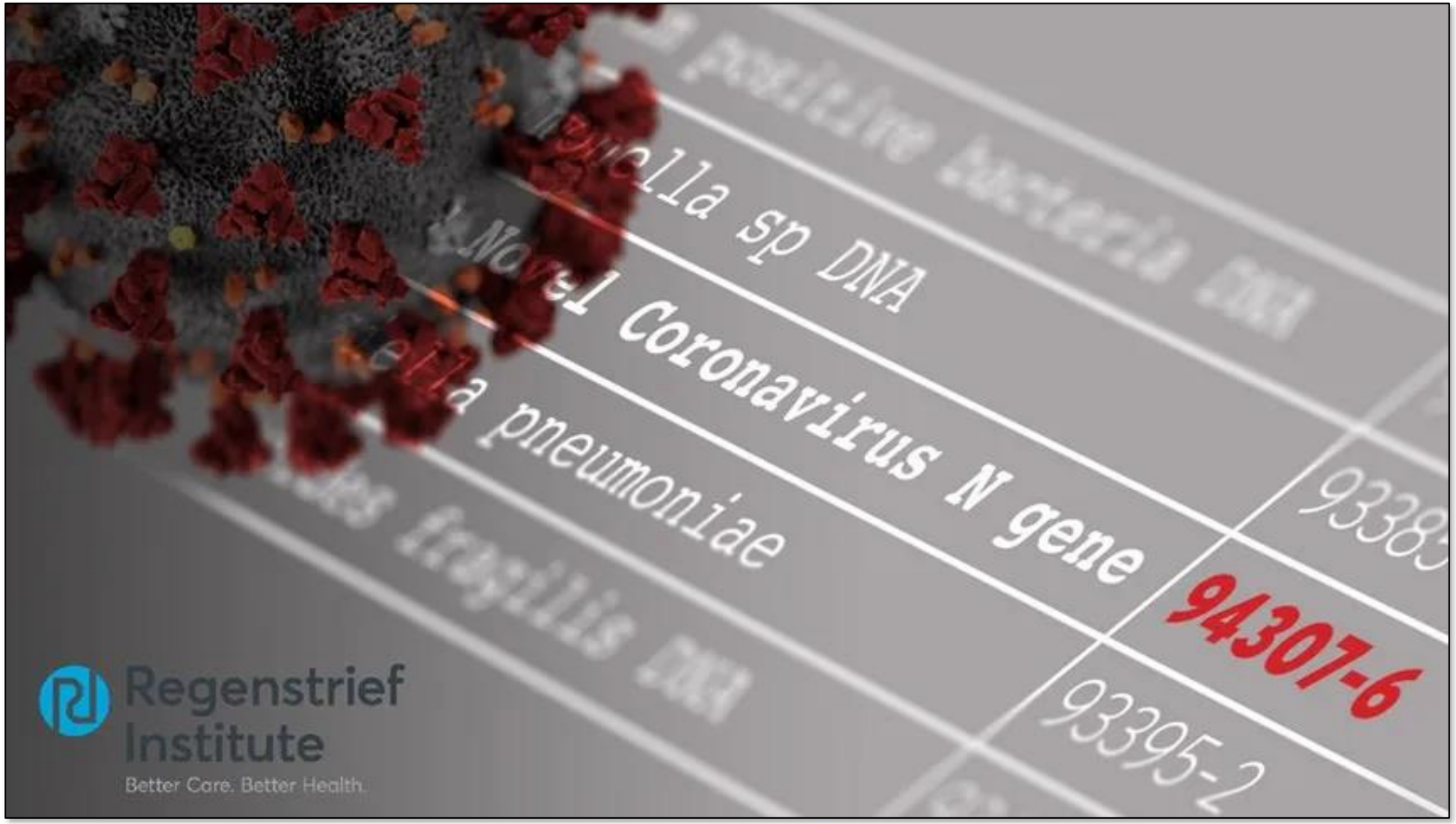
Fig. 1 Venn diagram depicting the count of unique cases with at least one report from one of the following data sources: Provider, Laboratory or Health Information Exchange (HIE). The overlapping sections of the diagram indicate how many unique cases contained at least one report from two or more data sources

Table 3 Timeliness by data source

Data Source	Total N	Mean # days	Median # days	Max # days	*P*-value for χ^2
Provider	1878	10.5	5	375	Reference
Faxed-LR	1142	3.6	2	367	<0.0001
HIE-ELR	7393	2.0	1	320	<0.0001
Any Laboratory[a]	8535	2.2	1	367	<0.0001

HIE Health information exchange, *ELR* Electronic laboratory report, *LR* Laboratory report
[a]Source here could be either HIE-ELR or Faxed-LR

Source: Dixon BE, Zhang Z, Lai PTS, Kirbiyik U, Williams J, Hills R, Revere D, Gibson PJ, Grannis SJ. Completeness and timeliness of notifiable disease reporting: a comparison of laboratory and provider reports submitted to a large county health department. BMC Med Inform Decis Mak. 2017 Jun 23;17(1):87. doi: 10.1186/s12911-017-0491-8.


Bordetella sp DNA
Novel Coronavirus N gene
94307-6
Chlamydophila pneumoniae
93395-2
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COVID-19 - 24-Hour Report

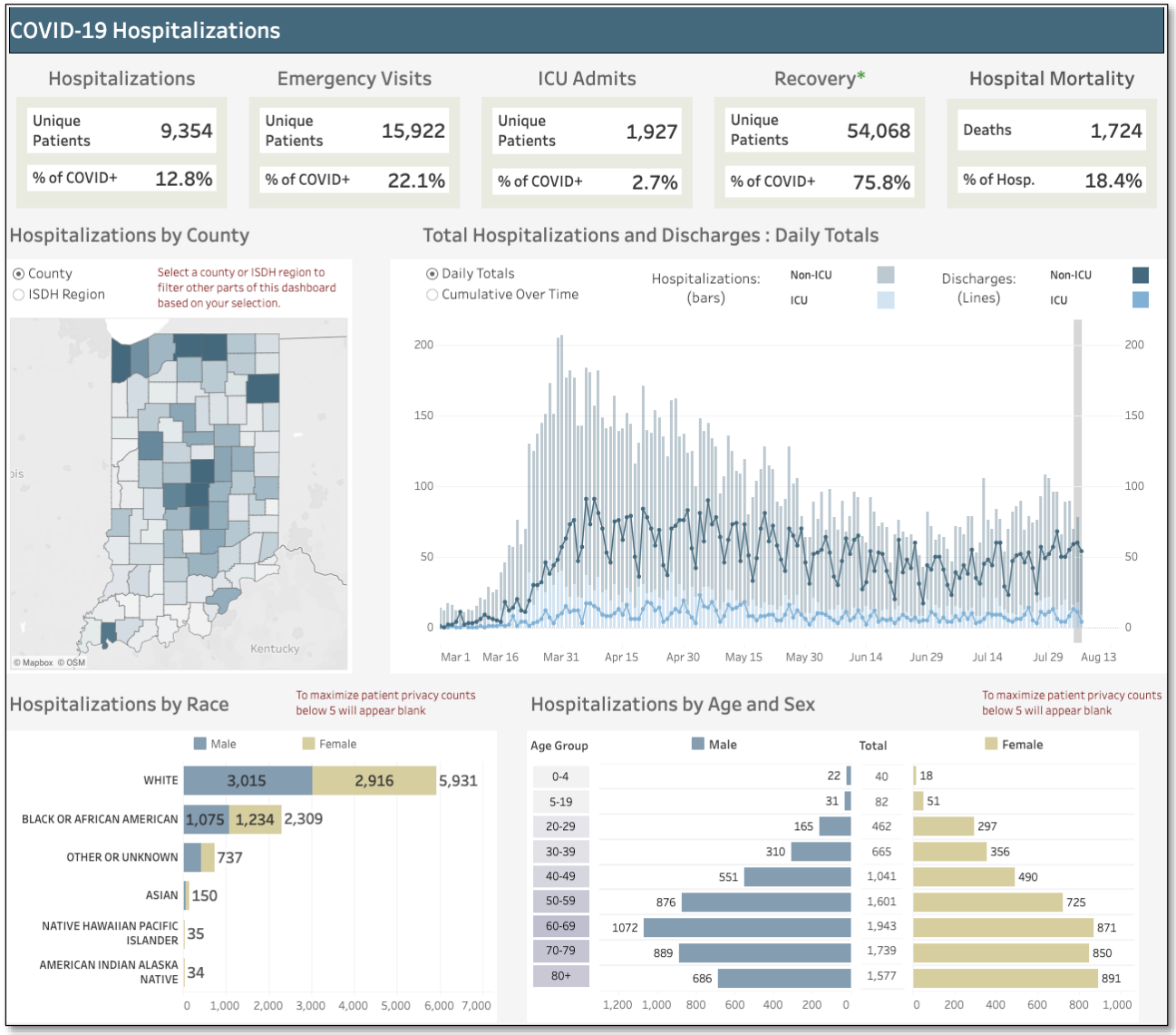
Results from: [redacted] 2020
Generated at: [redacted] 2020 04:15:00 GMT

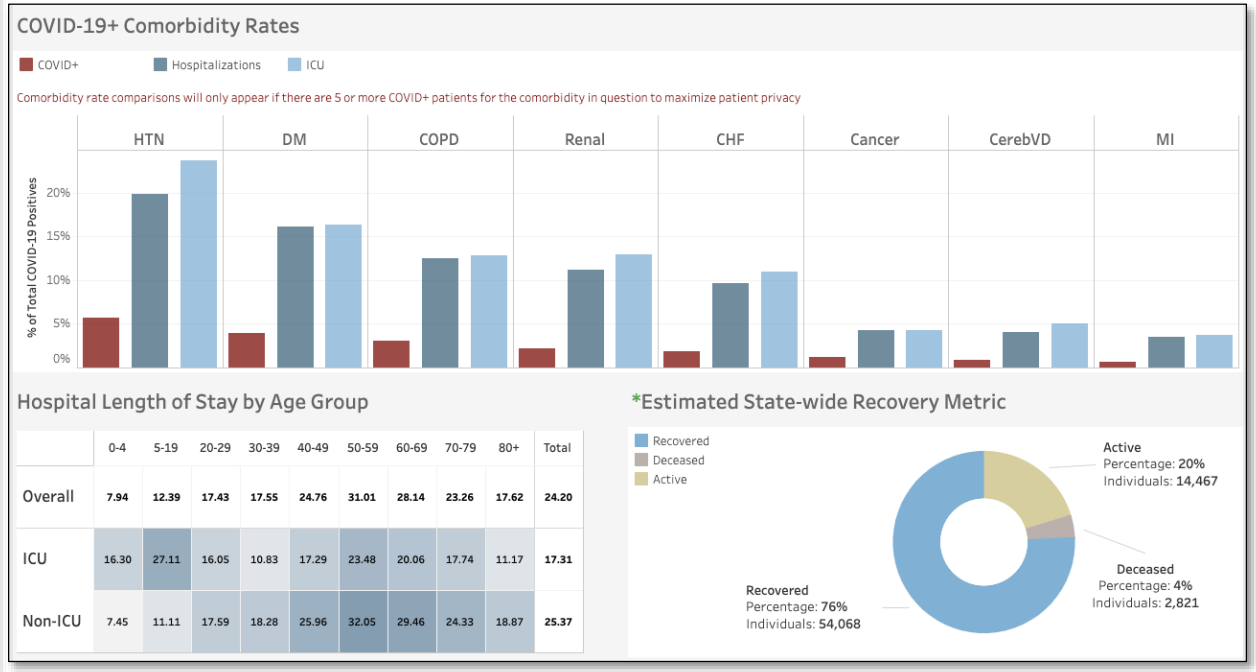
The table below contains the results from [redacted] 2020. A patient can have more than one result, and therefore can exist in this table more than once. As an example, a patient could have an Inconclusive result and a Not Detected result, and will then be counted in both areas.

Total Unique Patients represented in the table below: [redacted]

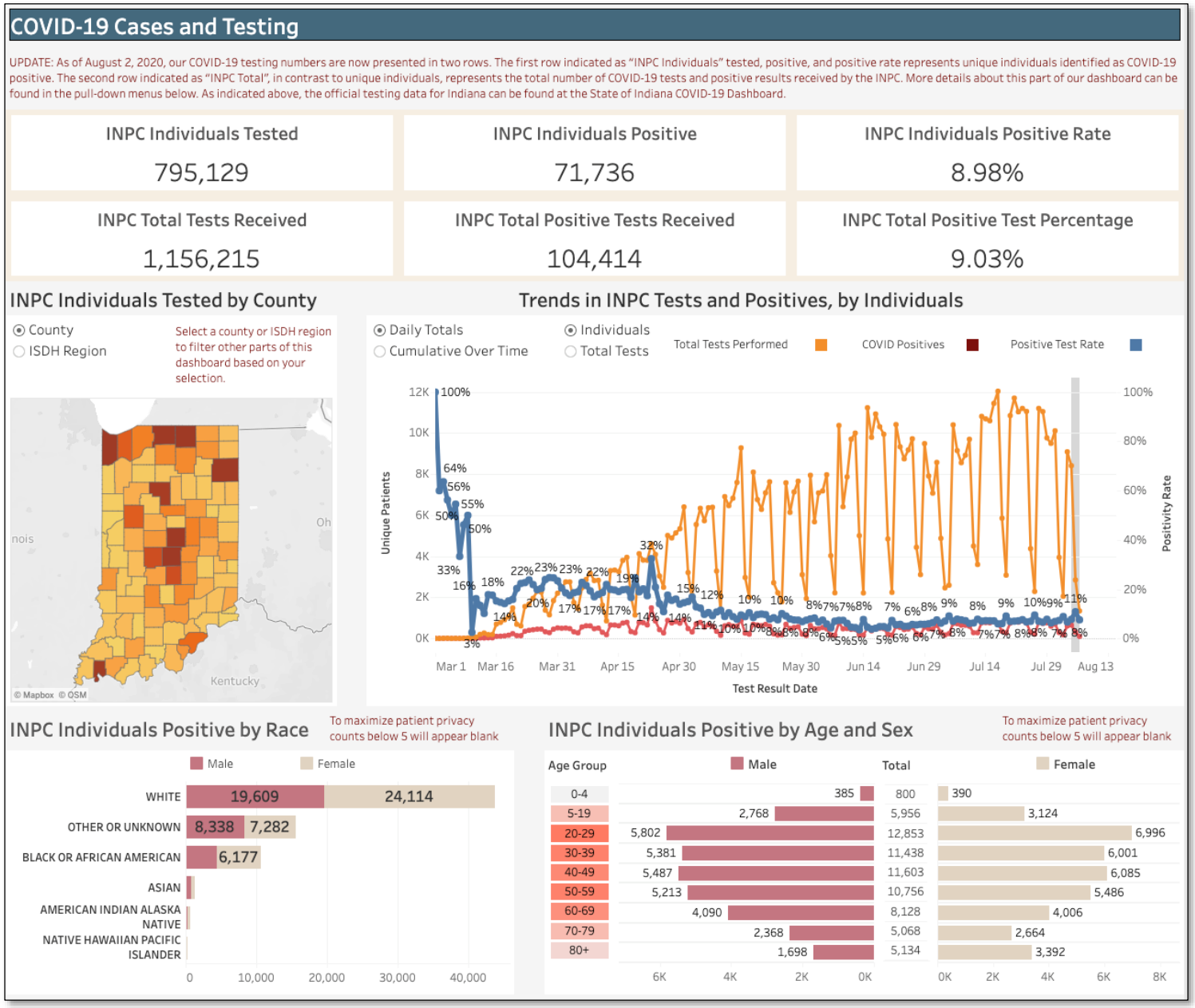
Result	Facilities	Unique Patient Count
DETECTED **Total Unique Patients:** [redacted]	[redacted]	[redacted]
NOT DETECTED **Total Unique Patients:** [redacted]	[redacted]	[redacted]

COVID-19 Hospitalization





COVID-19 Cases & Testing



COVID-19 Trending

COVID 19 Trends

This dashboard provides a simple way to see whether areas are experiencing changes in key metrics. Using a series of 7-day moving averages, green (decreasing), yellow (inconclusive), and red (increasing) colors identify trends. Bar charts to the right show daily counts for each metric. Trend indicators are not intended to predict future trends.

Select Georgraphic Area: (•) County ( ) ISDH District

Trend Indicators: Decreasing, Inconclusive, Increasing, Early Warning

Per Capita Quartiles: 0-25%, 25-50%, 50-75%, 75-100%

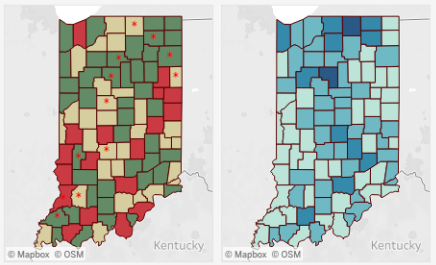
Hover over legends for definitions

Statewide Trends

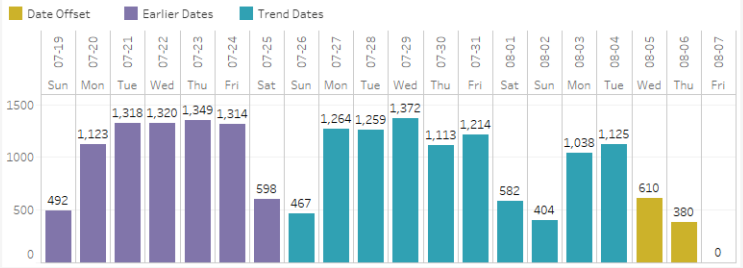
INPC Total Positive Tests

Click on districts or counties to filter the charts on the right; tooltips provide additional information

Trends Since Jul-26 | Per Capita Rates Since March 1



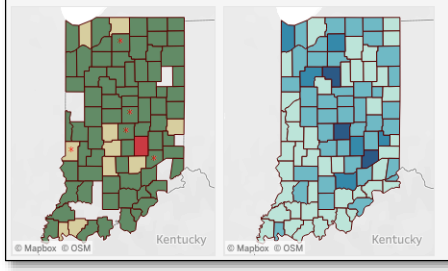
Positive Tests Daily Counts — All Counties, All Districts



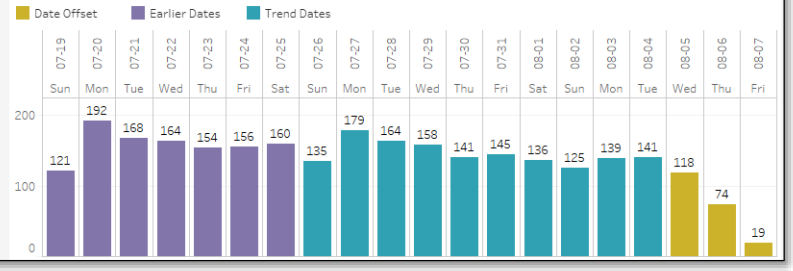
Emergency Room Visits

Click on districts or counties to filter the charts on the right; tooltips provide additional information

Trends Since Jul-26 | Per Capita Rates Since March 1



Emergency Room Visits Daily Counts — All Counties, All Districts



Trend Indicators Across Counties with Individual Bio Demographics

Click in the table below to filter bio demographic charts — Sort By: County

County and District Trend Indicators and Per Capita Rates

County	District	Population	Tests Positive	Emergency Visits	Hospital Admits	ICU Admits	Deaths
Adams	3	34,387	698	154	52	32	
Allen	3	355,329	1,033	229	136	14	23
Bartholo..	8	76,794	974	286	158	22	38
Benton	4	8,854	824	226	113		11
Blackford	6	12,766	525	157	78	23	16
Boone	5	56,640	1,091	228	79	55	35
Brown	8	15,242	361	105	59	13	13
Carroll	4	20,155	779	129	40	20	10
Cass	4	38,966	4,879	585	200	64	23
Clark	9	110,232	999	174	62	50	15
Clay	7	26,890	547	100	71	37	30
Clinton	4	33,224	1,159	241	90	27	9
Crawford	10	10,713	392	9			
Daviess	10	31,648	825	171	85	51	32
De Kalb	3	42,223	526	71	47	19	9
Dearborn	9	50,047	893	168	100	18	34
Decatur	9	25,740	1,402	470	272	54	66
Delaware	6	117,671	586	95	107	7	27
Dubois	10	41,889	1,260	12	17	17	7
Elkhart	2	197,559	2,286	214	108	1	16
Fayette	6	24,277	1,017	371	173	33	16
Floyd	9	74,578	855	42	25	15	13
Fountain	4	17,240	435	87	35		
Franklin	9	23,087	741	108	104	26	17
Fulton	2	20,836	811	163	110	19	5
Gibson	10	33,503	579	42	30	12	12
Grant	6	70,061	818	200	41	84	20
Greene	7	33,165	742	157	121	27	48
Hamilton	5	274,569	861	238	88	17	20
Hancock	5	70,002	1,000	236	64	59	21
Harrison	9	39,364	732	10		3	
Hendricks	5	145,448	1,046	222	125	28	31
Henry	6	49,462	894	214	117	20	26
Howard	6	82,752	1,019	230	100	94	40
Huntingt..	3	37,124	356	70	46	8	8
Jackson	8	42,376	1,447	434	113	59	17
Jasper	1	33,478	875	164	96	6	18
Jay	6	21,253	466	118	66		
Jefferson	9	32,428	429	68	28	6	3
Jennings	9	28,525	729	252	133	32	21
Johnson	5	139,654	1,082	233	120	42	34
Knox	10	38,440	414	75	34	10	
Kosciusko	2	77,358	888	133	62	19	9

Age Group Trend Indicators and Counts — All Counties, All Districts

Decreasing | Inconclusive | Increasing

	Tests Positive	Emergency Visits	Hospital Admits	ICU Admits	Deaths
0-4	801	201	39	3	1
5-19	5,941	776	77	9	1
20-29	12,819	2,062	441	48	5
30-39	11,402	2,321	614	87	14
40-49	11,539	2,542	957	176	43
50-59	10,700	2,516	1,453	285	108
60-69	8,085	2,303	1,729	454	346
70-79	5,015	1,691	1,520	462	472
80+	5,095	1,350	1,379	392	697

Race Trend Indicators and Counts — All Counties, All Districts

Decreasing | Inconclusive

	Tests Positive	Emergency Visits	Hospital Admits	ICU Admits	Deaths
AMERICAN INDIAN ALA..	617	104	33	4	1
ASIAN	1,342	367	142	25	14
BLACK OR AFRICAN AM..	10,664	3,879	2,101	410	377
NATIVE HAWAIIAN PAC..	290	87	32	6	5
OTHER OR UNKNOWN	6,022	1,710	704	73	68
WHITE	43,794	9,795	5,242	1,400	1,227

Sex Trend Indicators and Counts — All Counties, All Districts

Decreasing | Inconclusive

	Tests Positive	Emergency Visits	Hospital Admits	ICU Admits	Deaths
Female	37,973	8,505	4,122	870	771
Male	33,019	7,259	4,087	1,046	915
Other or Unknown	577	2	1		1

Comorbidity Trend Indicators and Counts — All Counties, All Districts

Decreasing | Inconclusive

	Tests Positive	Emergency Visits	Hospital Admits	ICU Admits	Deaths
Cancer	854	379	360	81	117
Cerebrovascular Disea..	653	325	339	96	136
Chronic Obstructive Pu..	2,193	1,283	1,042	245	271
Congestive Heart Failu..	1,294	763	799	211	287
Diabetes Mellitus [T 18..	2,795	1,434	1,331	312	322
Hypertension	4,069	1,957	1,590	454	385
Myocardial Infarction	447	275	292	71	106
Renal	1,555	872	927	247	331

Dr. Harm Scherpbier, MD, MS

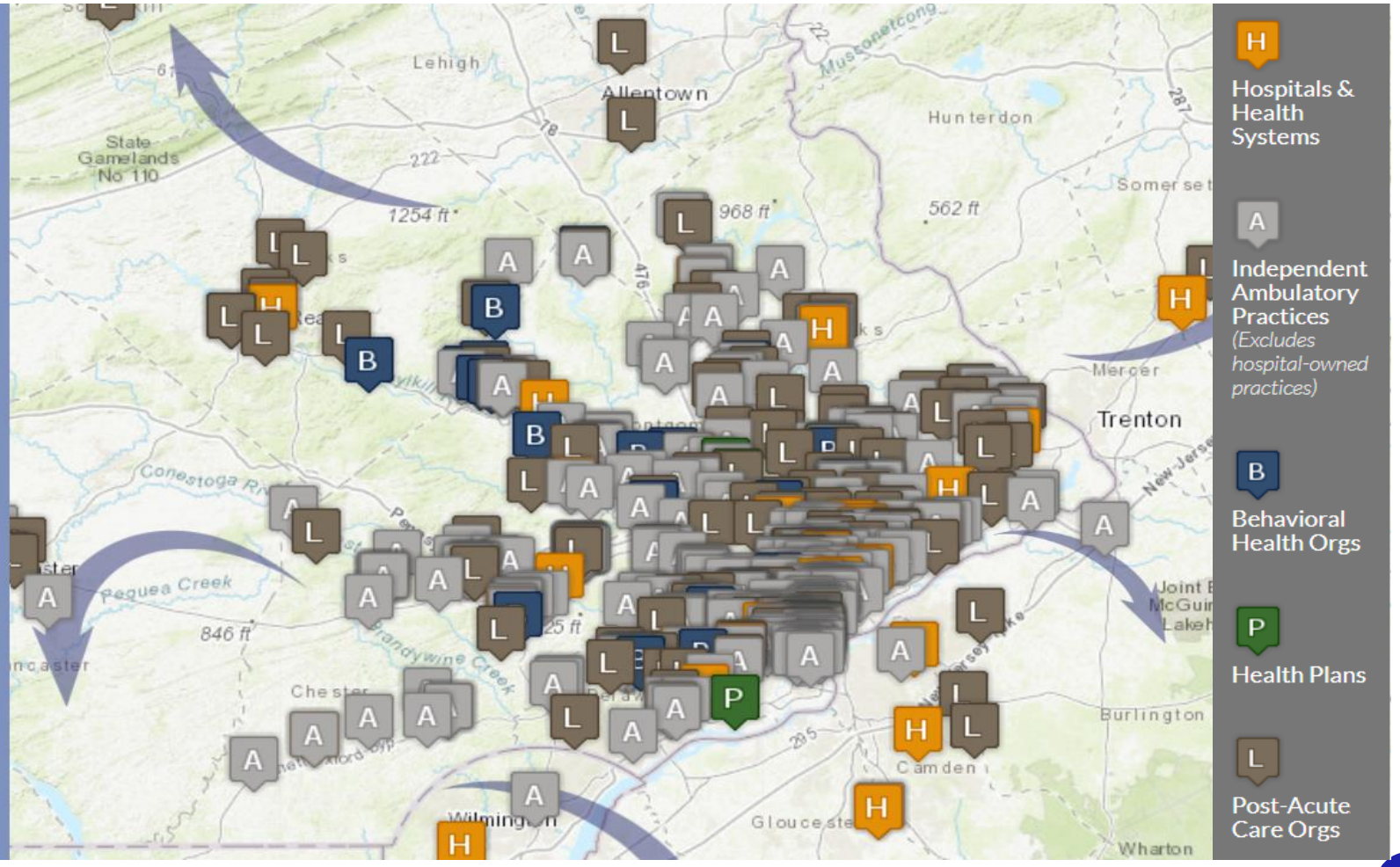
CMIO, HealthShareExchange

HIMSS Physician Committee Member

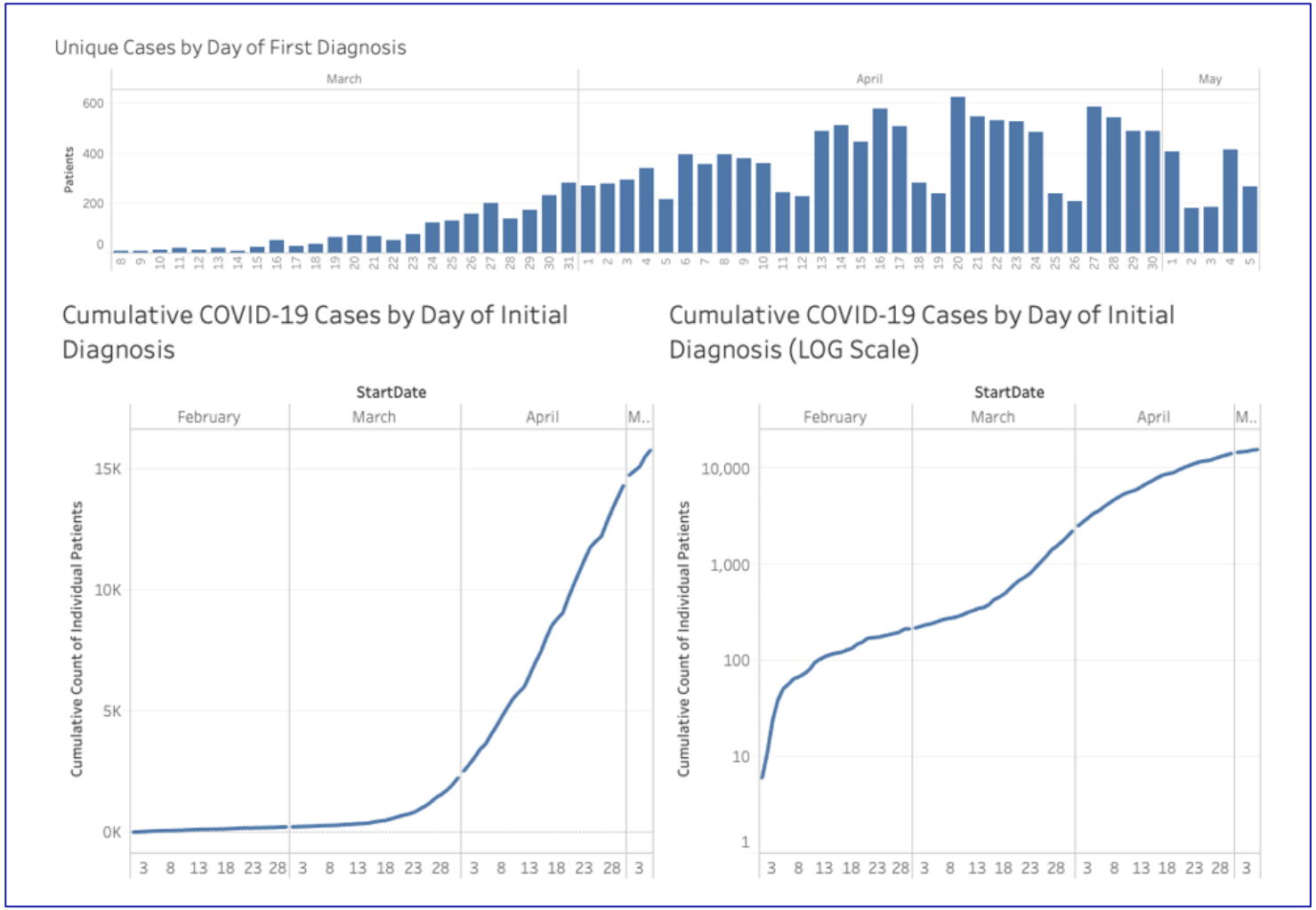
HealthShare Exchange HSX - Philadelphia region HIE

HSX MEMBERSHIP MAP

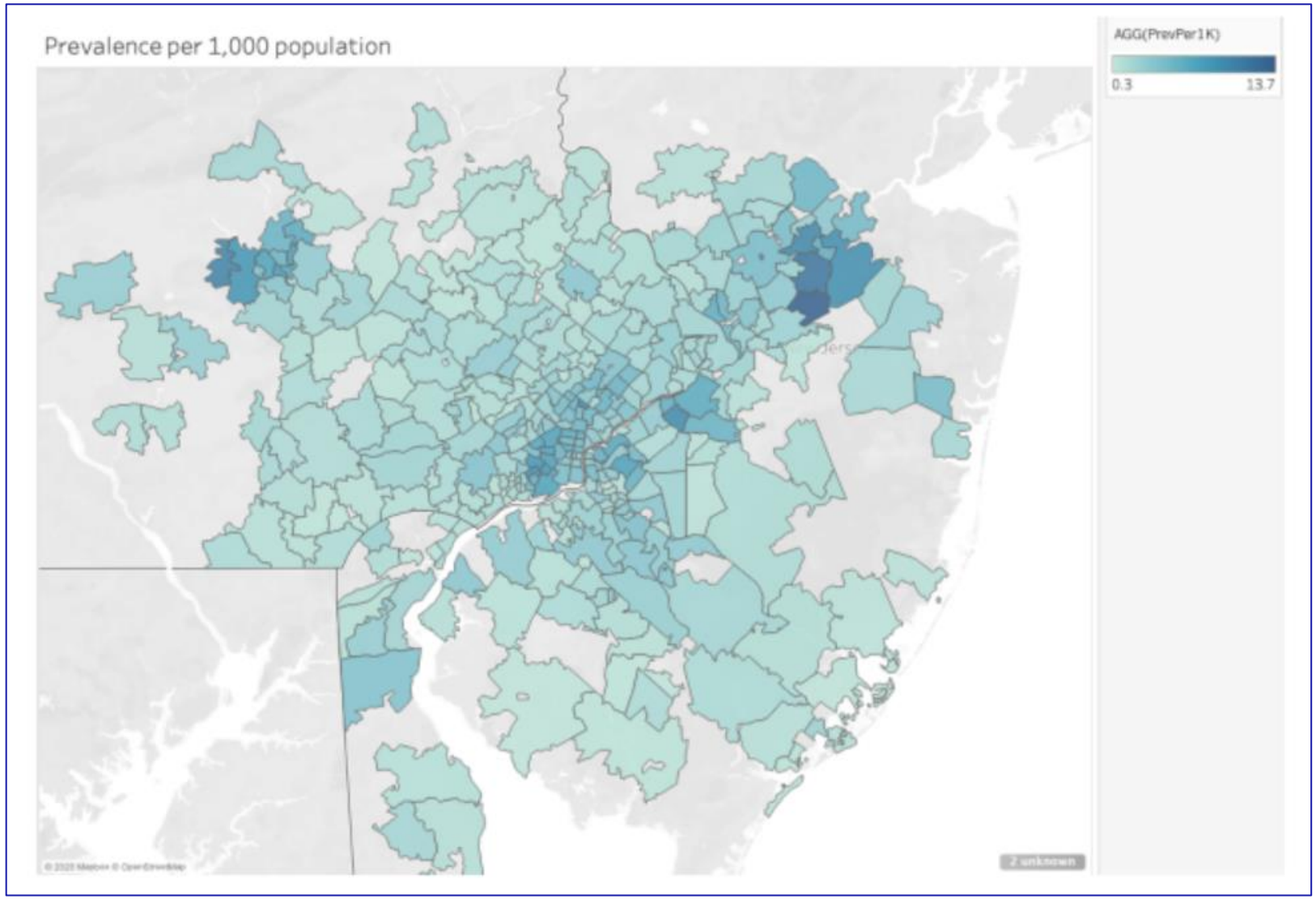
- Hospitals & Health Systems: 53
- Independent Ambulatory Practices: 207
- Behavioral Health Organizations: 7
- Post-Acute Care Organizations: 111
- Health Plans: 10
- Accountable Care Organizations: 6
- Other HSX Member Organizations: 22



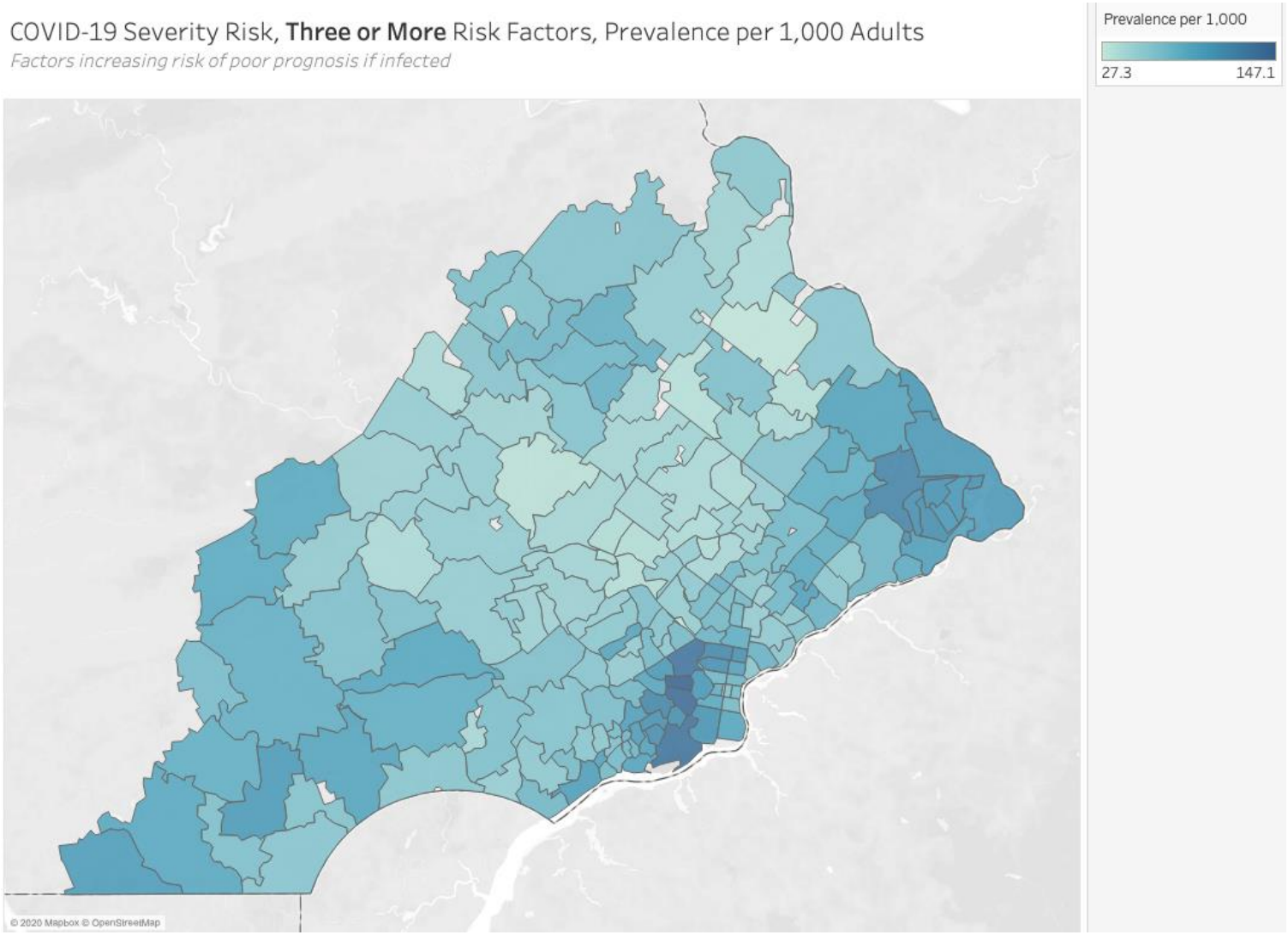
COVID Case Count



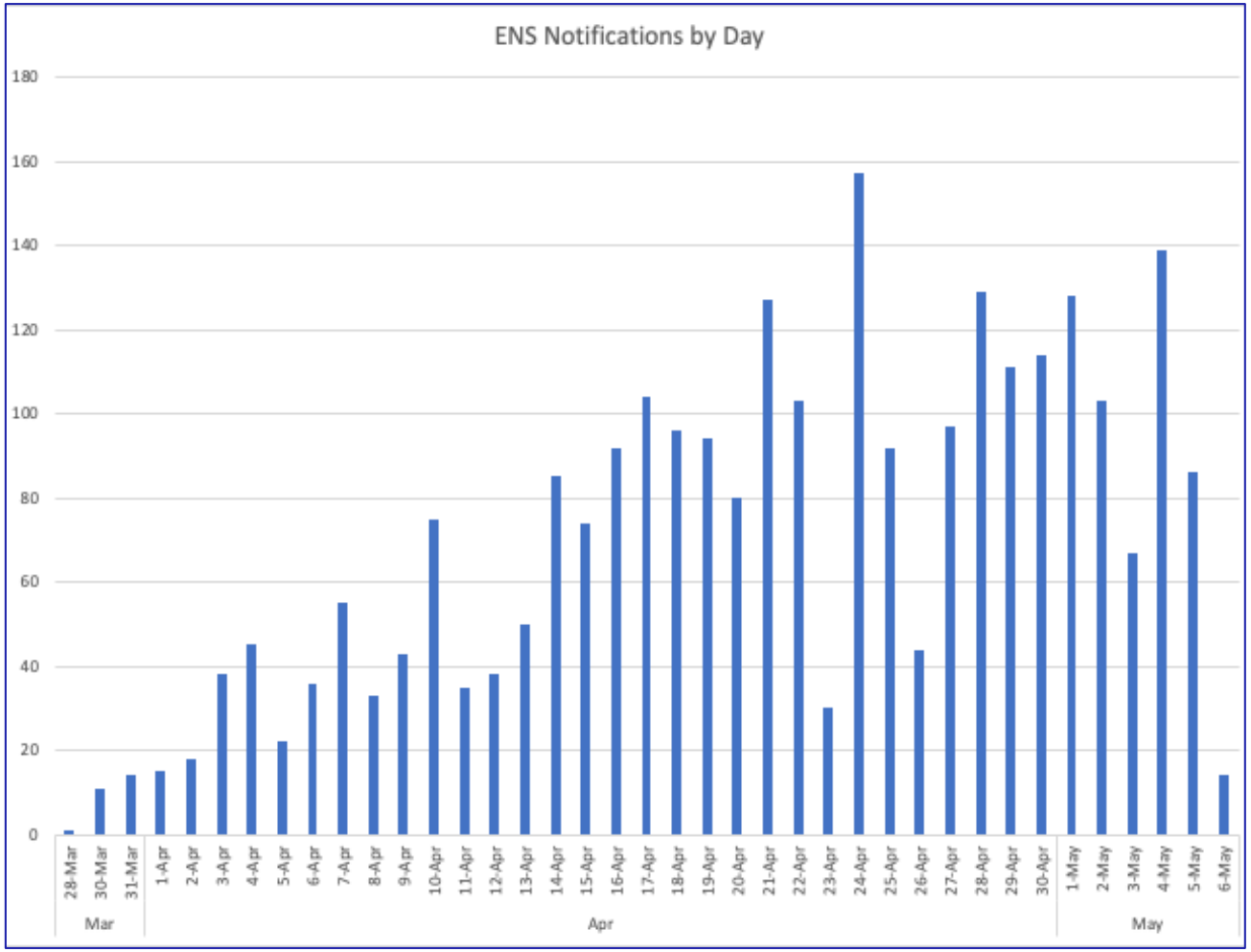
Regional Prevalence



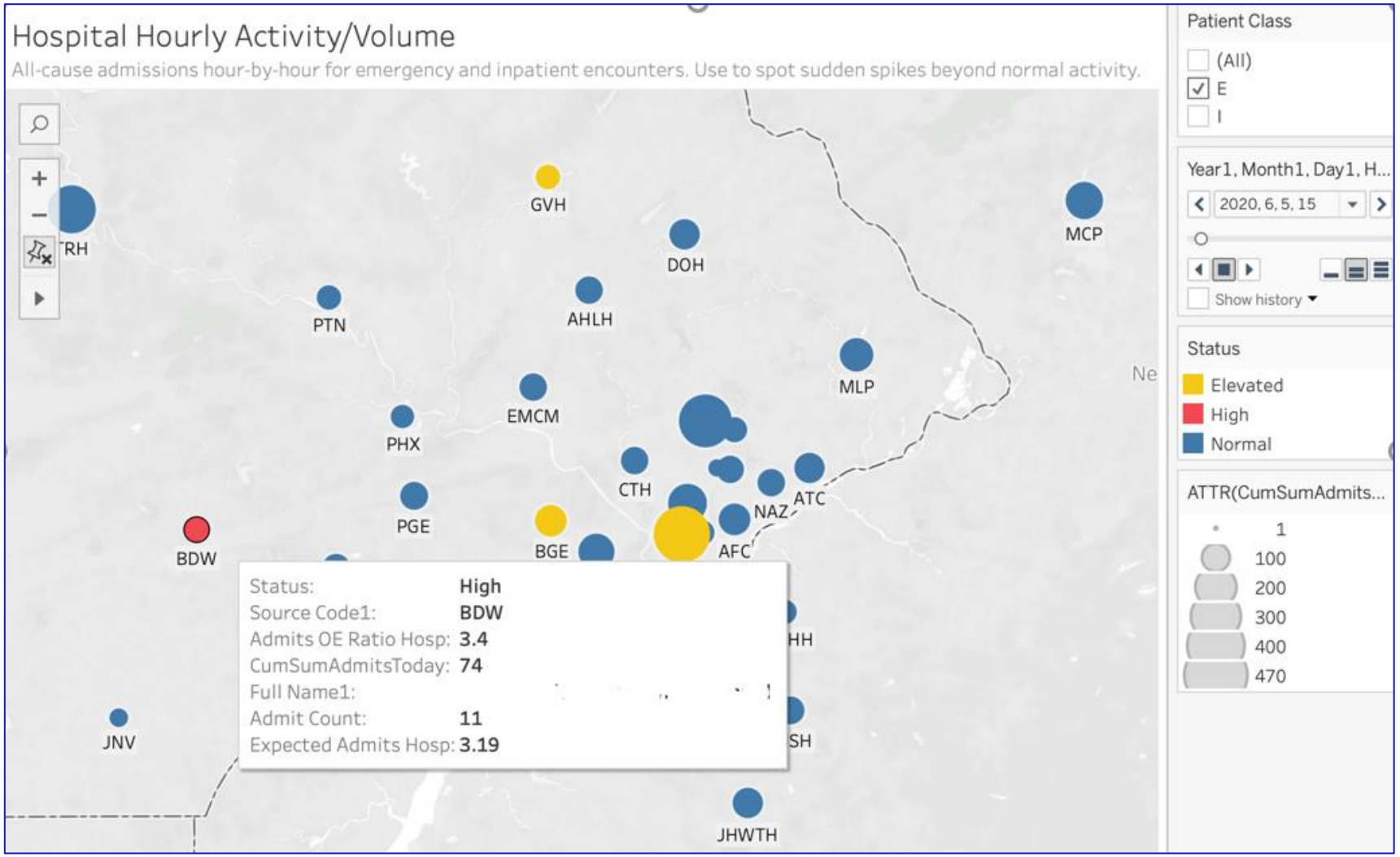
Risk Factor Prevalence



COVID Encounter Notifications - to PCP and Care Team



ED and Hospital volume-spike detection



HIEs are Data Aggregators

- We're like a recycling facility…
- And we need to ask you: please put it in the right bin!

Use HL7 and LOINC properly

(I removed the patient ID and order date/time fields above)
OBX|1|ST|COVSO^COVID Source^L^31208-1||Nasopharyngeal Swab|||||F
OBX|2|ST|COV19^COVID-19 (SARS CoV-2) Virus^L^94309-2||Positive||Negative|A|||F

(I removed the patient ID segments above)
OBX|1|NM|J101A^SARS COV-2 (COVID-19)^J101A^L^J101A^^LN^LAB|||||A|||F|||202004010101|T^|||||
NTE|1||Reference range: Negative\.br\(NOTE)\.br\\.br\Methodology:\.br\\.br\Roche cobas SARS-CoV-2 cleared for Emergency Use Only under FDA. FDA\.br\approved specimen types include nasopharyngeal swab or oropharyngeal\.br\swab collected using Copan UTM-RT system or BD Universal Viral\.br\Transport System (UVT).\.br\\.br\The cobas SARS-CoV-2 is a real-time qualitative PCR assay. This\.br\assay utilizes two targets - one is the ORF1/a, a non structural\.br\region unique to SARS-CoV-2.
(many lines with text describing methodology etc. removed here – hjs)
NTE|2||Positive||

LOINC groupings would help in aggregation

- Too many codes
- "Group" code would help aggregation and analytics
- Not just for COVID – for A1C, for Creatinine, for all labs!

2.68	94661-6	SARS-CoV-2 (COVID-19) Ab [Interpretation] in Serum or Plasma	SARS coronavirus 2 Ab	Imp	Pt	Ser/Plas	Nom	
	95825-6	SARS-CoV-2 (COVID-19) Ab [Presence] in DBS by Immunoassay	SARS coronavirus 2 Ab	PrThr	Pt	Bld.dot	Ord	IA
2.68	94762-2	SARS-CoV-2 (COVID-19) Ab [Presence] in Serum or Plasma by Immunoassay	SARS coronavirus 2 Ab	PrThr	Pt	Ser/Plas	Ord	IA
2.68	94769-7	SARS-CoV-2 (COVID-19) Ab [Units/volume] in Serum or Plasma by Immunoassay	SARS coronavirus 2 Ab	ACnc	Pt	Ser/Plas	Qn	IA
2.68	94504-8	SARS-CoV-2 (COVID-19) Ab panel - Serum or Plasma by Immunoassay	SARS coronavirus 2 Ab panel	-	Pt	Ser/Plas	-	IA
2.68	94503-0	SARS-CoV-2 (COVID-19) Ab panel - Serum, Plasma or Blood by Rapid immunoassay	SARS coronavirus 2 Ab panel	-	Pt	Ser/Plas/Bld	-	IA.rapid
2.68	94558-4	SARS-CoV-2 (COVID-19) Ag [Presence] in Respiratory specimen by Rapid immunoassay	SARS coronavirus 2 Ag	PrThr	Pt	Respiratory	Ord	IA.rapid
2.68	94562-6	SARS-CoV-2 (COVID-19) IgA Ab [Presence] in Serum or Plasma by Immunoassay	SARS coronavirus 2 Ab.IgA	PrThr	Pt	Ser/Plas	Ord	IA
2.68	94768-9	SARS-CoV-2 (COVID-19) IgA Ab [Presence] in Serum, Plasma or Blood by	SARS coronavirus 2 Ab.IgA	PrThr	Pt	Ser/Plas/Bld	Ord	IA.rapid

Use LOINC not only for labs

- Use LOINC codes for imaging reports, cath reports, op reports etc.
- USCDI moves in that direction – partially
- Providers: make sure you map these in your C-CDAs

Data Element	Applicable Standards(s)
Consultation Note >	▪ Consult Note (LOINC® code 11488-4)
Discharge Summary Note >	▪ Discharge Summary (LOINC® code 18842-5)
History & Physical >	▪ History and Physical Note (LOINC® code 34117-2)
Imaging Narrative >	▪ Diagnostic Imaging Study (LOINC® code 18748-4)

LOINC needs to "highlight" codes for preferred use

LOINC® from Regenstrief

cardiac cath

LOINC	LongName	Component
80243-9	Cardiac catheterization access site	Cardiac catheterization access site
80258-7	Pre-cardiac catheterization diagnosis	Pre-cardiac catheterization diagnosis
80528-3	Catheterization and angiography preoperative information panel	Catheterization & angiography preoperative information panel
80190-2	Catheterization and angiography procedure details panel	Catheterization & angiography procedure details panel
78949-5	Catheterization and angiography procedures performed panel	Catheterization & angiography procedures performed panel
88089-8	Type of Specialty services available	Specialty services available

Can we please "standardize the standard"

LOINC® from Regenstrief

cardiac study report Search

LOINC	LongName	Component	Property	Timing	System
59282-4	Stress cardiac echo study report	Stress cardiac echo study report	Find	Pt	Heart
18745-0	Cardiac catheterization study	Study report	Find	Pt	Heart
85474-5	Cardiac implantable loop monitor study report	Cardiac implantable loop monitor study report	Find	Pt	{Setting}
18143-8	Heart chambers Study observation Narrative by US	Study observation	Find	Pt	Heart.chambers
12076-6	Fetal Heart chambers Narrative Study observation US	Study observation	Find	Pt	Heart.chambers^Fetus
76640-2	Coronary artery catheterization Study report	Study report	Find	Pt	Coronary arteries
18843-3	EKG Comparison study (narrative)	Comparison.study	Imp	Pt	Heart

What is the right code for Discharge Summary?

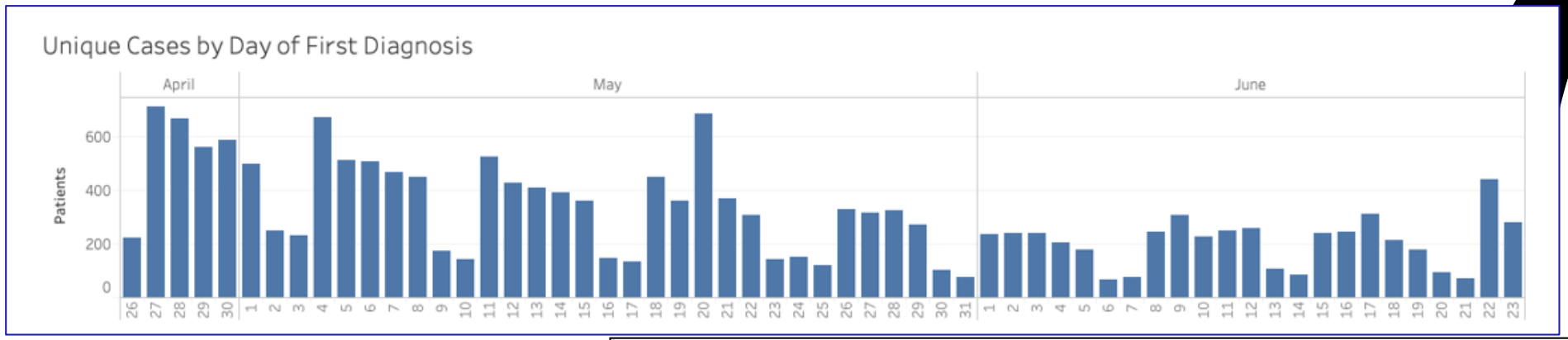
- These are all good
- But USCDI only mentions the first one
- Group code would also solve this.

LOINC® from Regenstrief

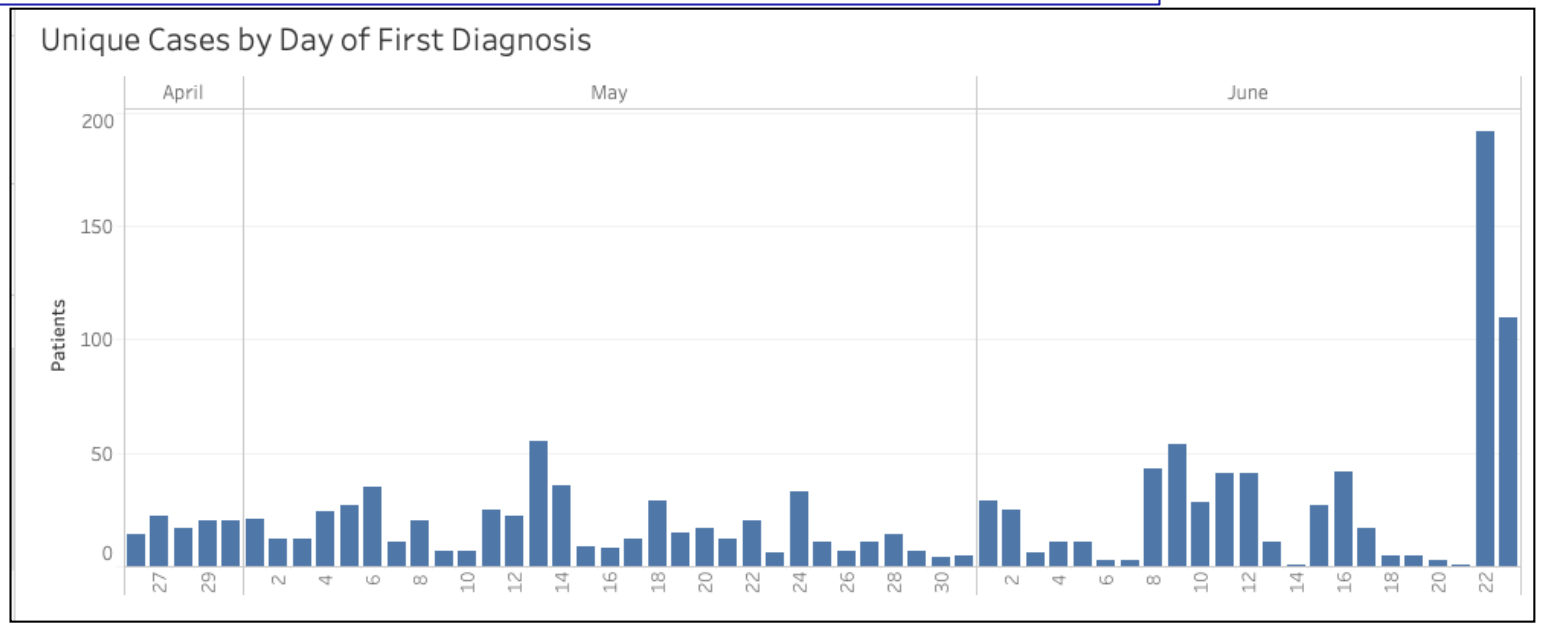
discharge summary

LOINC	LongName	Component
18842-5	Discharge summary	Discharge summary note
87256-4	Addiction medicine Discharge summary	Discharge summary note
68612-1	Adolescent medicine Discharge summary	Discharge summary note
68626-1	Allergy and Immunology Discharge summary	Discharge summary note
94515-4	Anesthesiology Discharge summary	Discharge summary note
28655-9	Attending Discharge summary	Discharge summary note
94516-2	Audiology Discharge summary	Discharge summary note
85514-8	Bariatric surgery Discharge summary	Discharge summary note
94465-2	Bone Marrow Transplant Discharge summary	Discharge summary note
77409-1	Cardiology Discharge summary	Discharge summary note

Use ICD-10 properly please



- **Drill down to one data source**
- **All COVID tests (!) coded as U07.1**



After removal of incorrectly coded encounters

Bottom line for Interoperability Rules of the Road

- Use the right codes, use the right transaction formats
- Standards organizations: keep it simple, and focus on usability
- HIEs as Data Aggregators are the canaries in the coal-mine for data quality and consistency
- Critical role during this and future pandemics and public health emergencies

Leslie Kelly Hall

Founder, Engaging Patient Strategy

HIMSS Interoperability & HIE Community Co-Chair

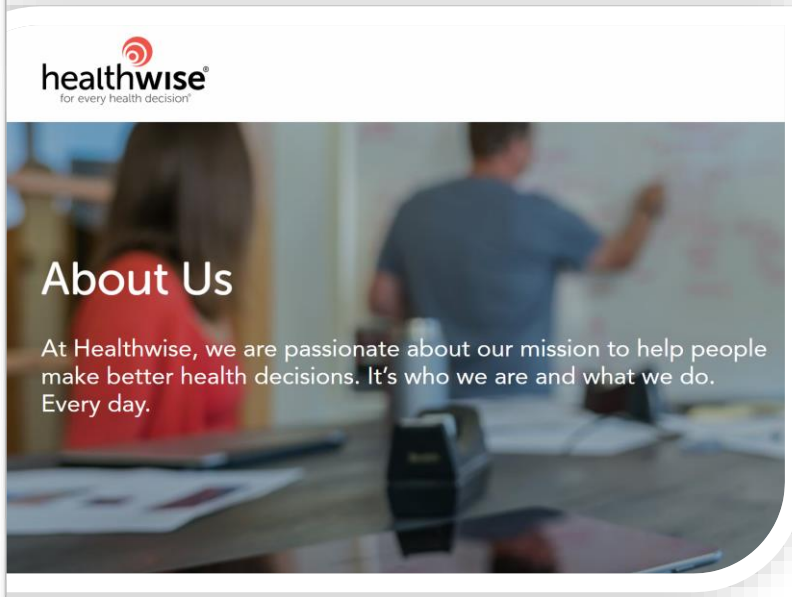
COVI

Advocate. Consultant. Speaker. Volunteer.

WORK

Her career path has featured journeying in the realms of computing and network systems, which led to years of health information technology (HIT) executive leadership for a large hospital system in Idaho where she used her strategic IT skills to interoperate, integrate, inform, and include all stakeholders in care: the patient too.

While at Saint Alphonsus Health System, she led a team to implement electronic health records to include digital radiology, cardiology, labs, pharmacy, notes, and much more, interoperating 56 separate systems across 7 Idaho healthcare organizations to support Idaho's first statewide physician web portal and patients'



HIMSS

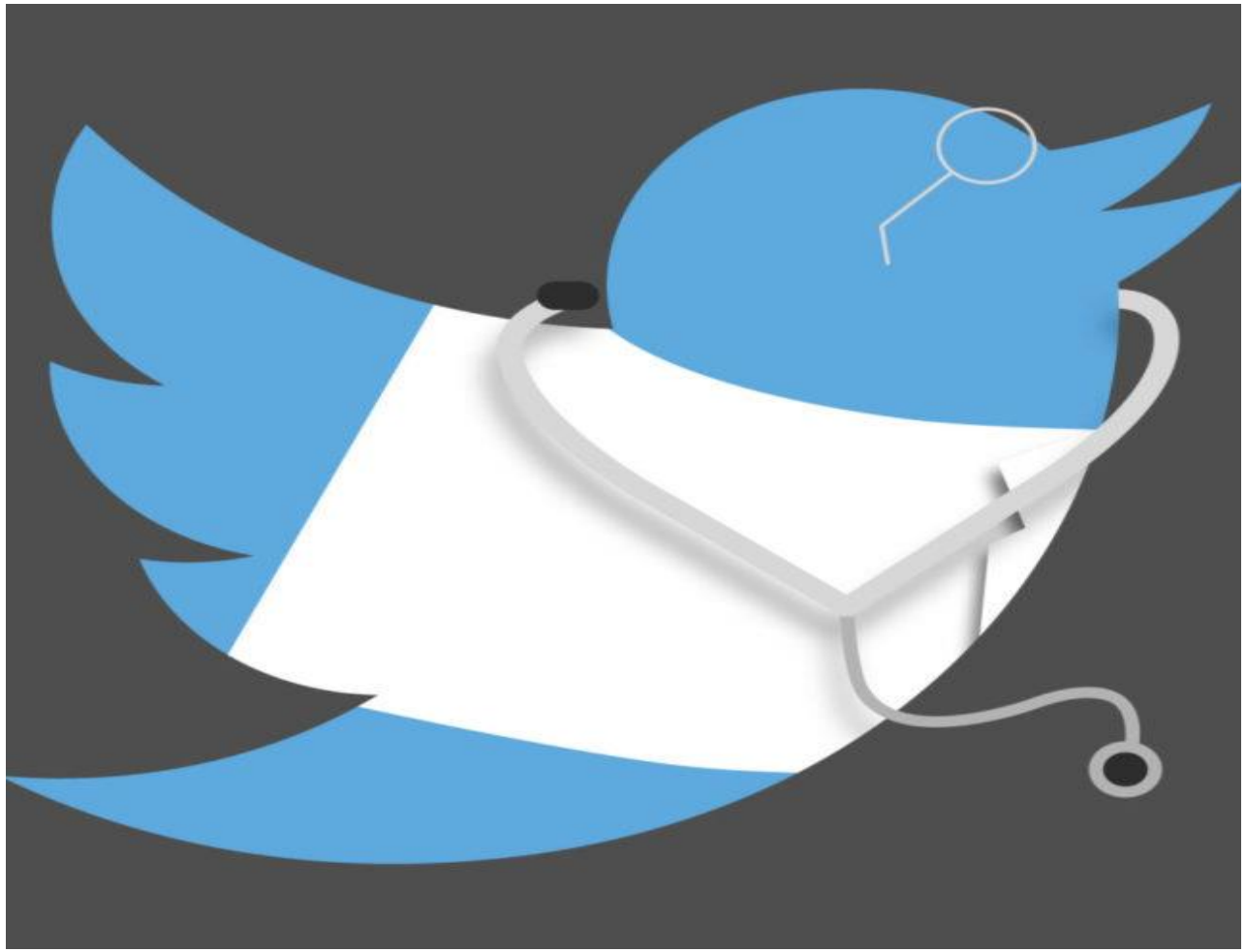
Health is public

We are in crisis in many fronts

- **Pandemic**
  - Testing shortage
  - Persons awaiting results
  - Contract tracing
  - National anxiety
  - Vaccination anxiety

Our lives include

Health Information at the speed of….



Our systems are not designed for health crisis

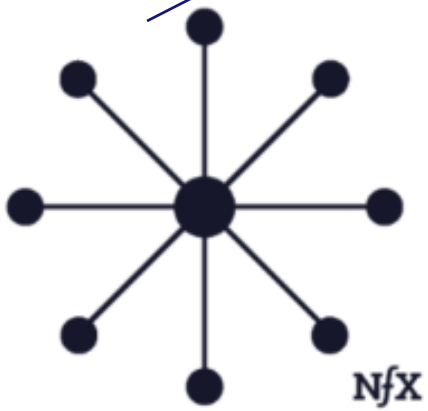
- EMR Centric
- Health system specific
- Integration siloes
- Patient Portals “binary”
- Tele-health as episodic care replacement

Is the digital explosion the " Brute Force" event for interoperability?

https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/meet-the-next-normal-consumer

Sarnoff's Law

Telehealth and portals



$V=n$

The value of the network (V) increases in direct proportion to the size of the network (n).

Metcalfe's Law

$V=n^2$

The value of the network increases to the square of the number of users in the network.

Reed's Law

$V=2^n$

Networks may grow proportionally to the network size but there are forming groups that scale faster in value than others (because of influence or interconnectedness).

Source; NFX*Bible

Sarnoff's Law

Organizational EMR Today

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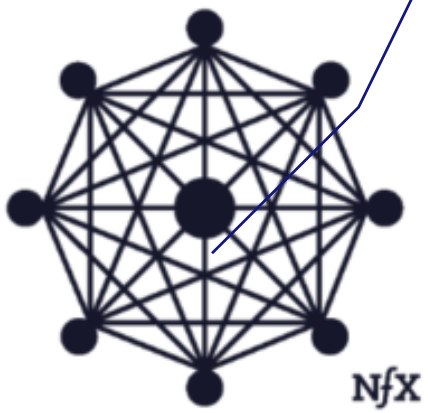

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Some interoperability in advanced orgs and HIE

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Consumer world today

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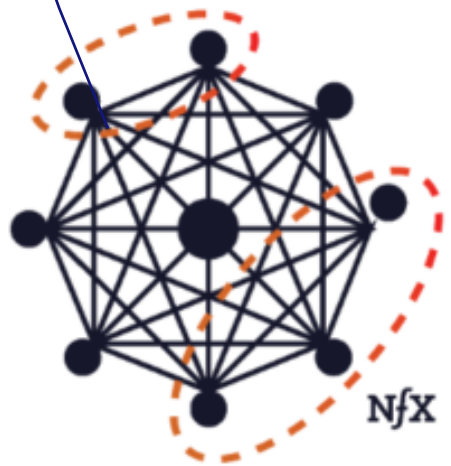

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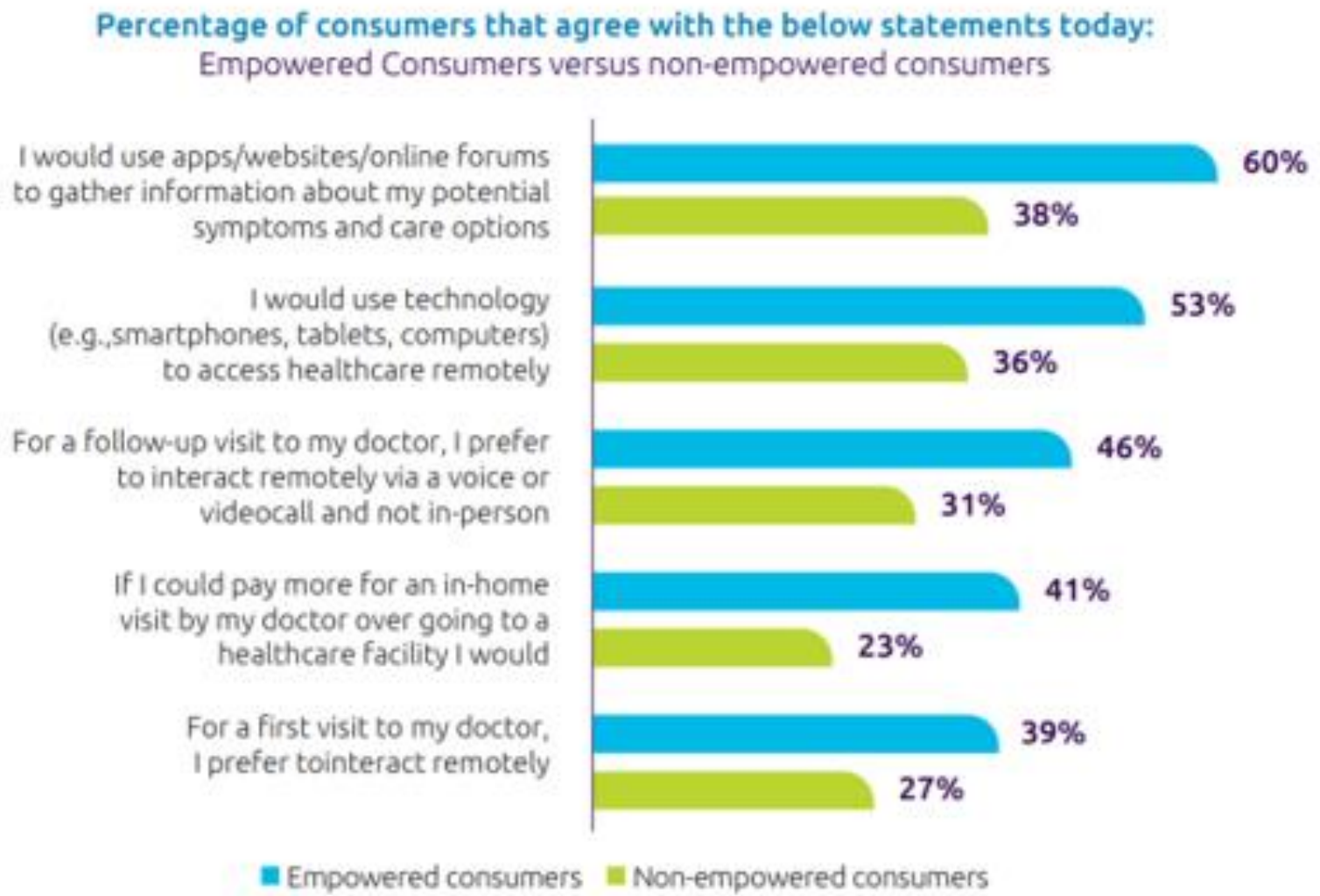
Source; NFX*Bible

Figure 7: The majority of Empowered Consumers will gather information and research their symptoms online



Source: Capgemini Research Institute, Consumer Health Survey, June 2020, N=2,039 consumers; N=531 Empowered Consumers.

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Questions?

Open Discussion

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Thank you!

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