

Innovating in Healthcare with HealthShare

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InterSystems

Agenda



Healthcare innovation

Innovation Trends

Innovation Chasm

HealthShare

Embedded ML and Notifications

Matching Records

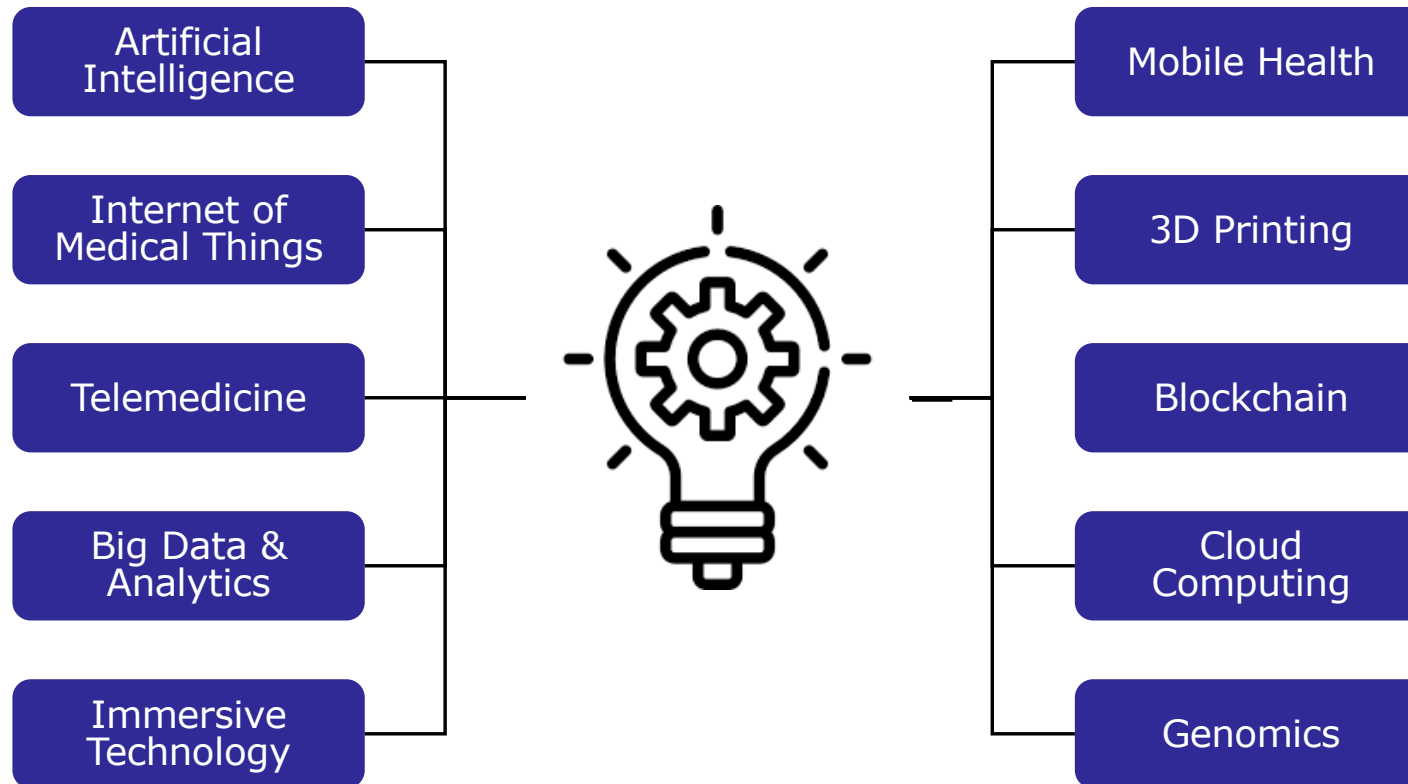
Innovation at the bedside

What is Healthcare Innovation

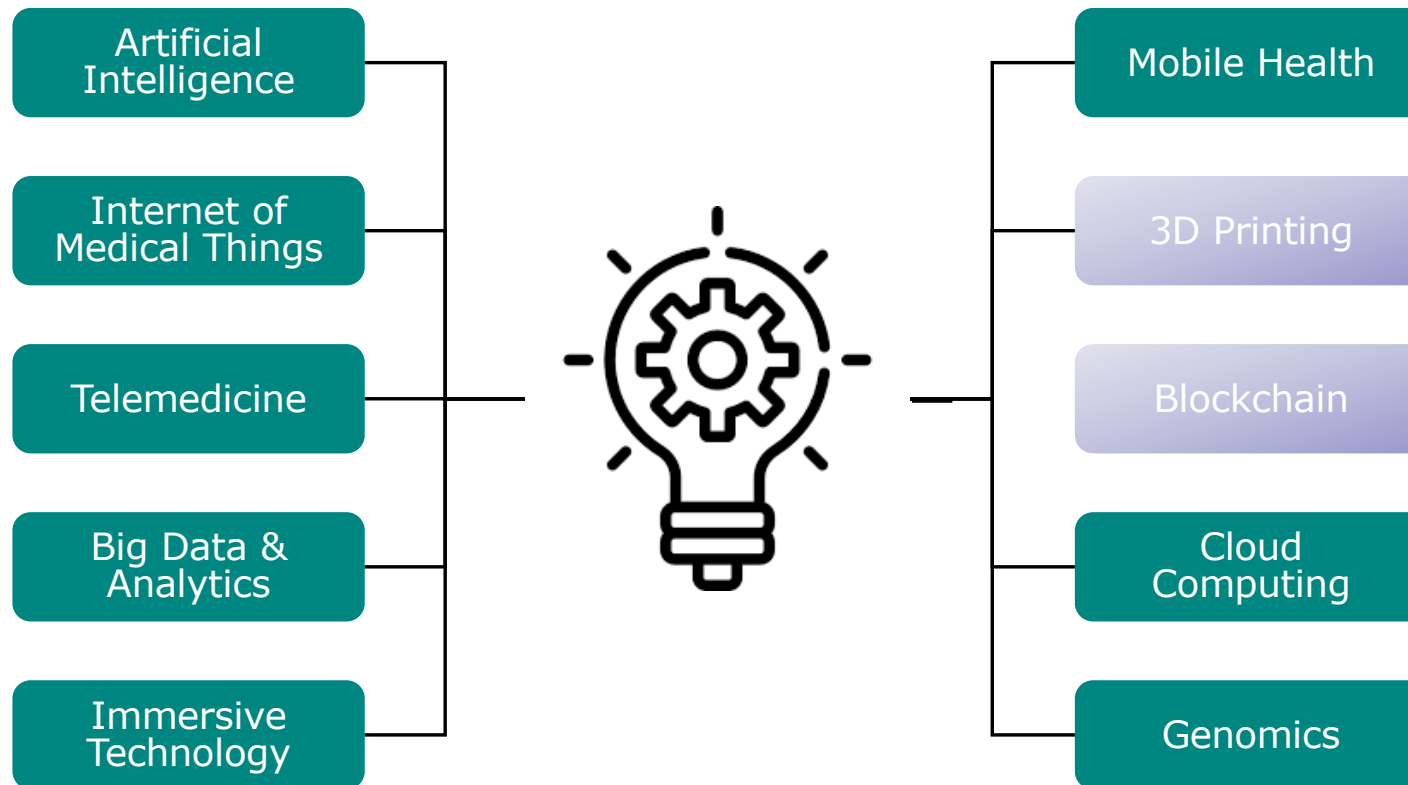


Any developments, simple or complex, that lead to improvements in health outcomes and patient experiences

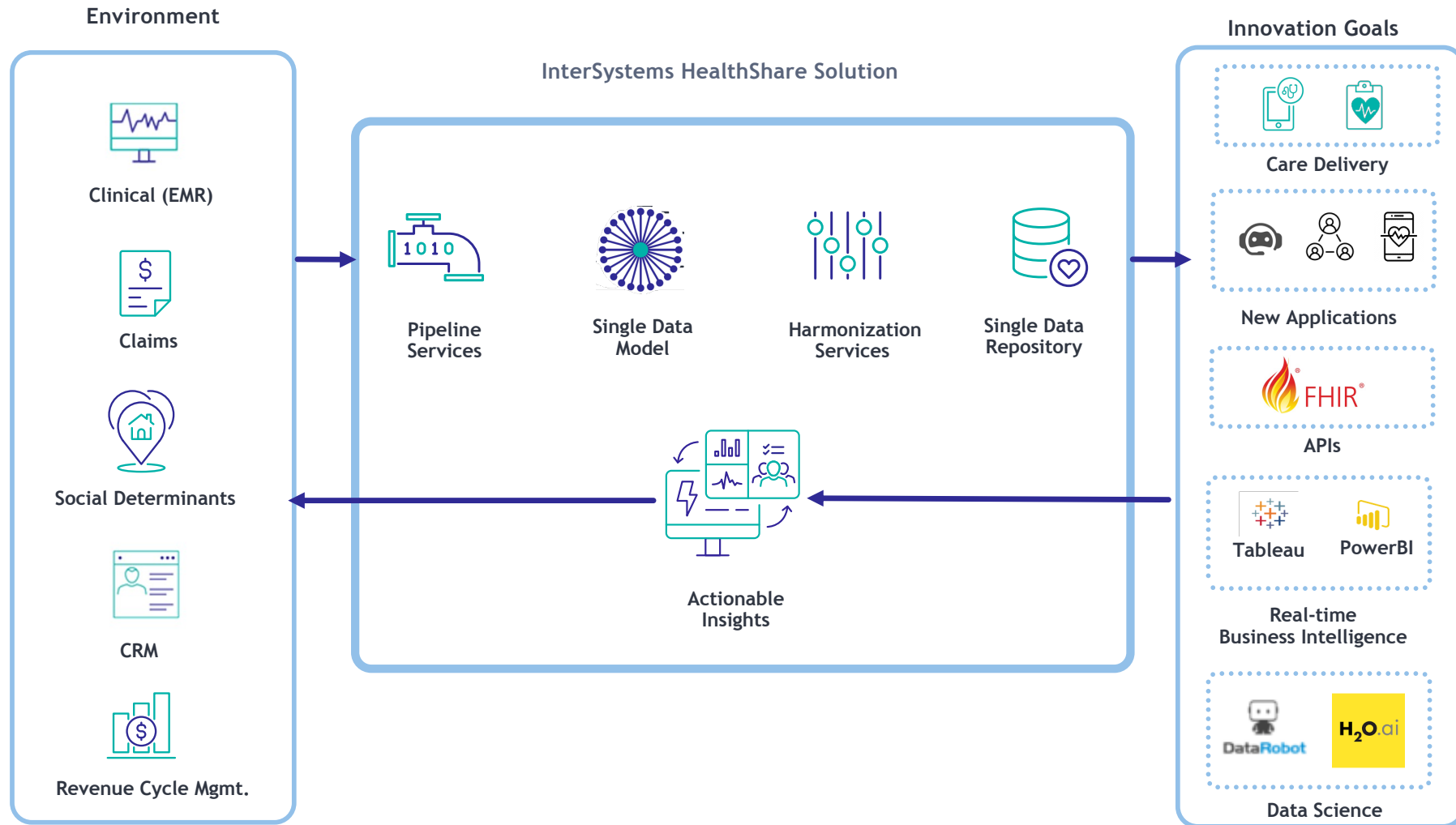
Healthcare Innovation: Industry Trends



Healthcare Innovation: Industry Trends 2012



Innovation Chasm



HealthShare Solution Stack



InterSystems IRIS for Health

Massively Scalable, Cloud-First, Heterogeneous Health Data Management, Out-of-Box Standards-based Interoperability, FHIR Application Development Framework, AI/ML



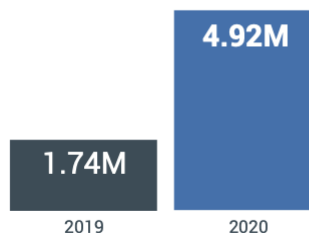
Embedded ML and Notifications



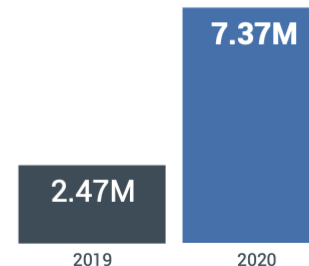
Largest public health information network in the US



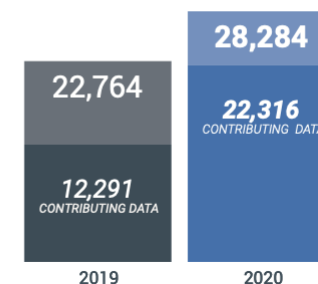
PATIENT RECORDS VIA EHR (MONTHLY AVERAGE)



ALERTS (MONTHLY AVERAGE)



HEALTHIX PARTICIPATING CUSTOMERS



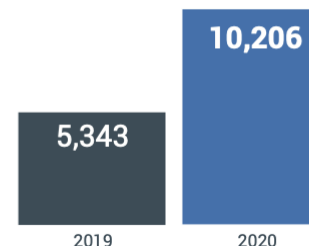
	2019	2020
Hospitals	65	81
OREs	448	731
Physicians	22,065	27,246
CBOs/BHOs	128	159
Health Plans	16	19
IPA, ACO, PPS	15	15
Other	27	33
TOTAL	22,764	28,284

* ORE includes articles 28, 36, 40
** Other includes Public Health, EMS, Pharmacies, etc.

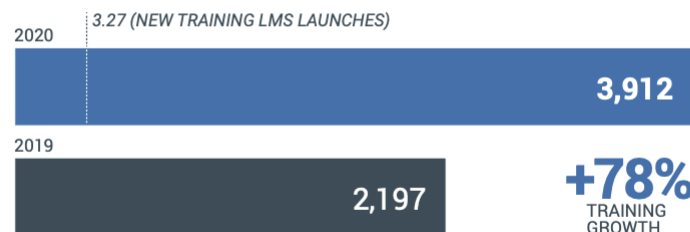
GROWTH IN NUMBER OF PATIENTS



PATIENT RECORDS VIEWED IN PORTAL (MONTHLY AVERAGE)



HEALTHIX CORE TRAINING COMPLETIONS



PATIENTS IN HEALTHIX

STATE RESIDENCY	TOTAL NUMBER
New York	29,490,323
New Jersey	1,912,045
Florida	471,941
Connecticut	386,511
Texas	324,887
California	318,727
Pennsylvania	199,932
Ohio	86,713
Nevada	79,254
Massachusetts	69,951

*Data for top 10 states collected 2019-2020

DATA DELIVERY

Real-time encounter alerts & clinical updates

ALERTS

Healthix Alerts

Healthix Alerts allow you to follow all or just selected patients for a series of event triggers.

SMART ALERTS

Healthix SMART Alerts

Healthix SMART Alerts are triggered by analyzing a change in a patient's condition, lab result or characteristics.

CIU

Healthix Clinical Information Update

Healthix CIU provides instant and continuous information on all aspects of a person's medical record delivered right into your IT system.

DATA RETRIEVAL

Patient health records, CCDs, CCDAs, summaries and more

QUERY

Healthix Query

Patient information queried through the Healthix Portal complete with filters to enhance usability.

QUERY+

Healthix Query+

Healthix data accessed through single sign-on (SSO) to Portal and full medical documents received via CCD Query right from your EHR.

SMART QUERY

Healthix SMART Query

Healthix provides SMART Query so you can access patient information from your EHR using APIs, FHIR and filtered CCD.

DATA DISCOVERY

Analytics, Research, Reporting

ANALYTICS

Healthix Analytics

Determine a patient's risk of an event or of developing a chronic disease. Reach out before an event or condition occurs.

RESEARCH EXCHANGE

Healthix Research Exchange

Healthix provides de-identified and identified data on a vast and richly diverse population with 8+ years of medical history.

INSIGHTS

Healthix Insights

Healthix Insights provides an in-depth overview of your patients across geography, providers and facility type. This is essential in today's value-based care environment.

DATA DELIVERY

Delivering real-time 24/7 patient information, with alerts and advanced updates.



Healthix Alerts

Healthix Alerts fall into two broad categories. The first are triggered by an event, such as an admission or discharge from an emergency department and the second by advanced alerts that require analysis to determine the status of the patient.

Types/Triggers

Standard Alerts

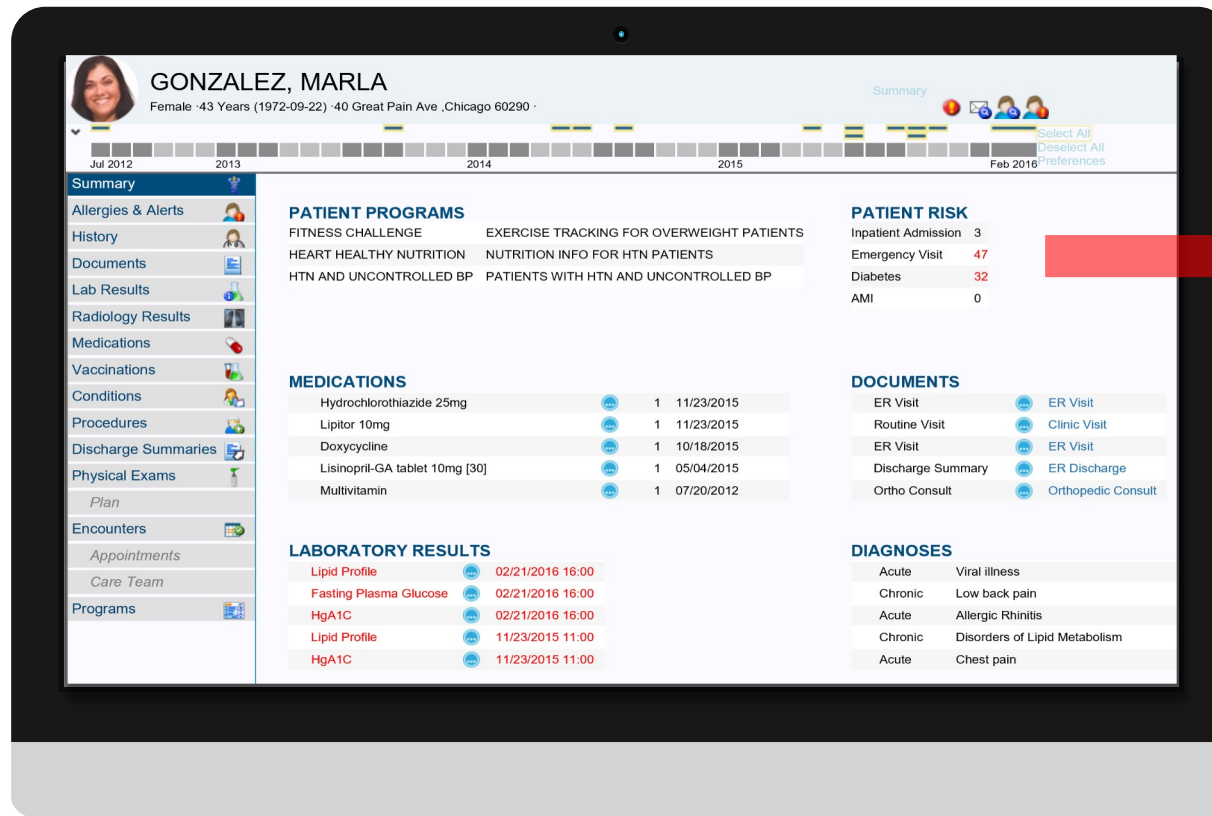
Centers for Medicare & Medicaid Services Alerts (Hospitals Only)
Emergency Room Admit/Discharge
Inpatient Hospital Admit/Discharge
Skilled Nursing & Rehab Admit/Discharge
Patient Death
NY Correctional Incarceration/Release
COVID-19- Test, Result

Advanced Alerts

Physician Note
Elevated Risk (Admission, Illness)
Avoidable re-admission
Homelessness
Lost-to-care
Lab/Clinical
- Viral load levels
- COVID-19
- Pertussis
- C. Auris
- Hep B
- Hep C
- TB
- Herpes
- Syphilis
- Zika
- Listeria
- HIV
eMOLST
Custom Alerts



Predictive Analytics to Inform Care



PATIENT RISK	
Inpatient Admission	3
Emergency Visit	47
Diabetes	32
AMI	0

Elevated risk are indicated in red

- 47% likelihood of ED visit in next 12 months
- 32% likelihood developing diabetes in next 12 months

Success Stories



Healthix Alerts and Primary Care | New York Health

Healthix Alerts are among the most fundamental services provided by one of the nation's largest public health information exchanges, yet their simplicity can disguise immense power. New York Health is leading the way in demonstrating their value to elevate primary care.



NYU Langone Health and Healthix Collaboration Helps Fulfill End of Life Choices

eMOLST Access. Partnership optimizes portability, visibility, and ease of use for Electronic Medical Orders for Life Sustaining Treatment.



HEALTHIX GAPS IN CARE

Northwell Health Solutions, Using Healthix to Fill Gaps in Care

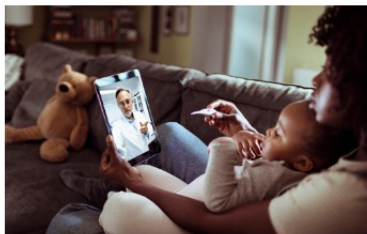
Northwell, one of the largest healthcare systems in the nation, currently uses the monthly Healthix Gaps in Care Report as an additional layer of information on top of its own data, to examine and fill patient gaps.



LIVEONNY AND HEALTHIX, PARTNERING TO SAVE LIVES

LiveOnNY and Healthix, Partnering to Save Lives

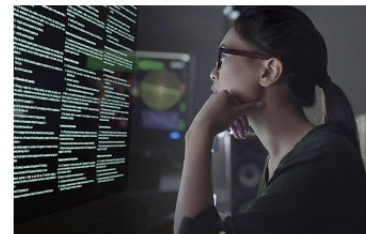
Query of Clinical Documents: Healthix has partnered with LiveOnNY for years, helping to make an almost insurmountable challenge a reality.



DIAGNOSTIC AND TREATMENT CENTER

DTC Succeeds with Healthix Alerts and Telehealth

Real-time Alerts & Query of Clinical Documents: Advantage Care Diagnostic & Treatment Center thrived during the peak of the coronavirus outbreak and credits Healthix' modified telehealth workflow and COVID-19 Alerts, in part, for their success.



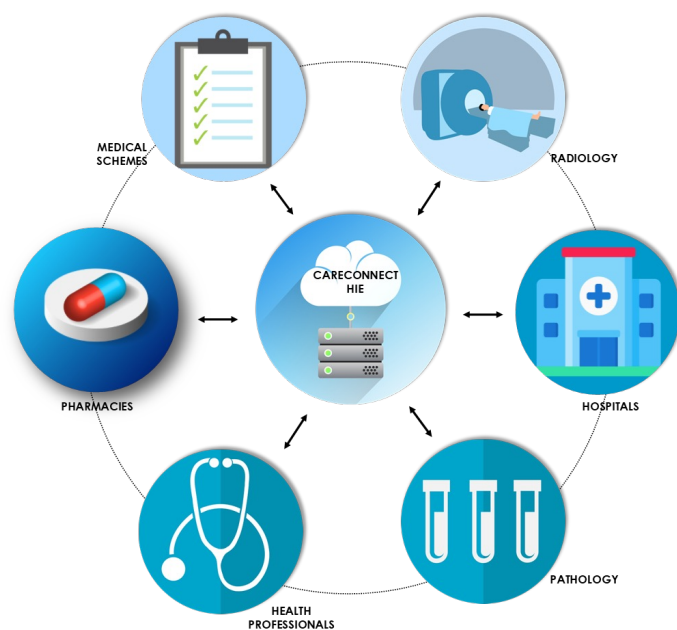
PUBLIC HEALTH/EMERGENCY

Healthix Data Helps Locate Missing Persons Due to COVID-19

Real-time Alerts & Query of Clinical Documents: New York City health officials paired their Unified Victim Identification System (UVIS) with Healthix Alerts and the clinical and demographic data in the HIE's portal to help police find missing individuals during the height of the COVID-19 pandemic.



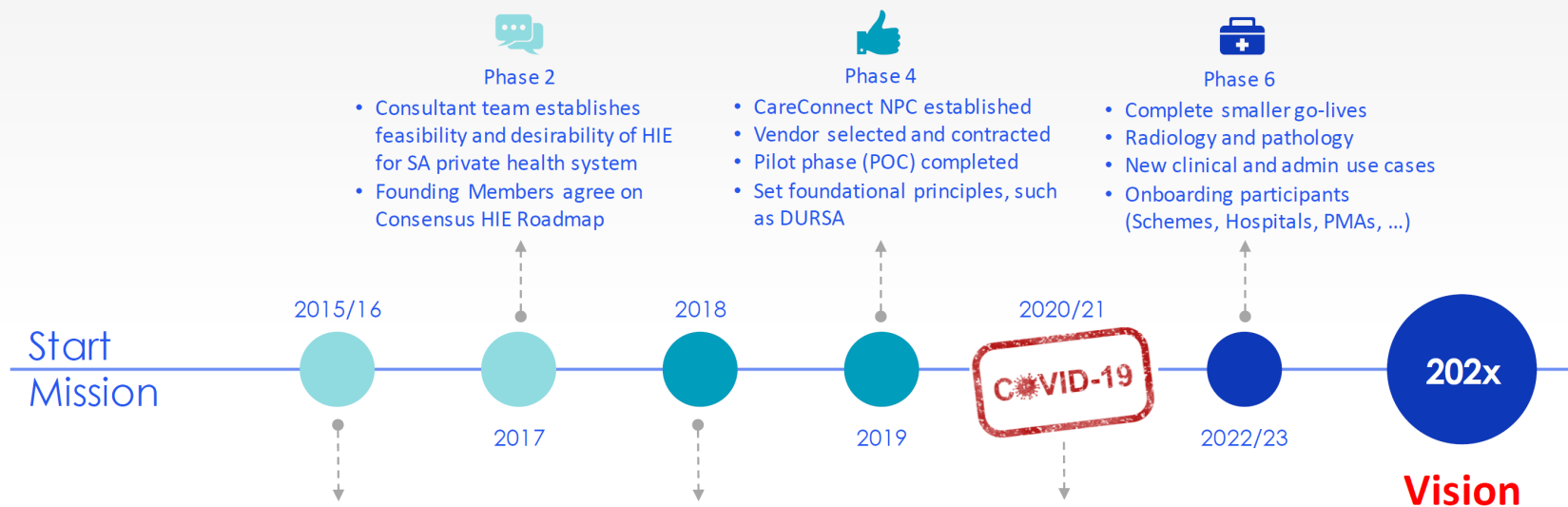
Record Matching in the Rainbow Nation



Exchange of information through the CareConnect HIE



Journey



Patient Matching

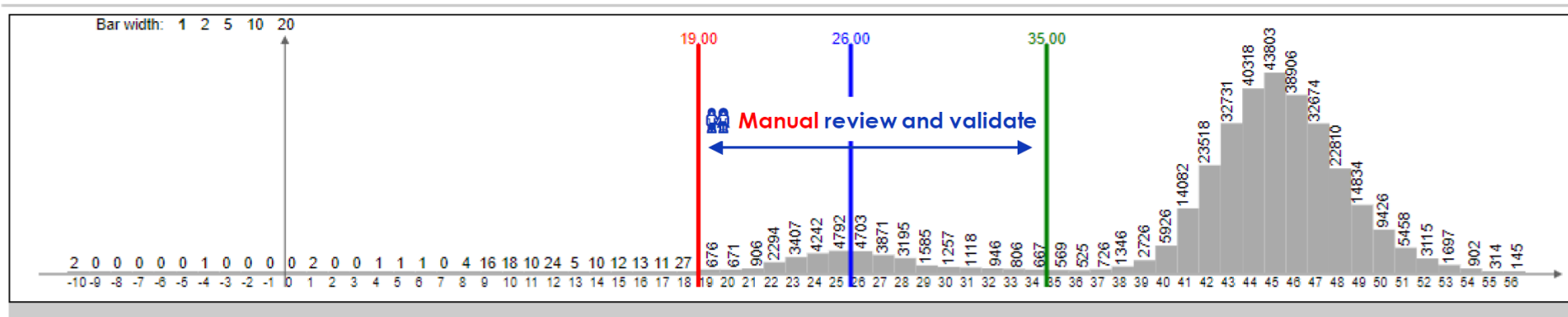


4.5 Million
Unique Patients in
the exchange

0.89% review
Less than 1% required
manual intervention

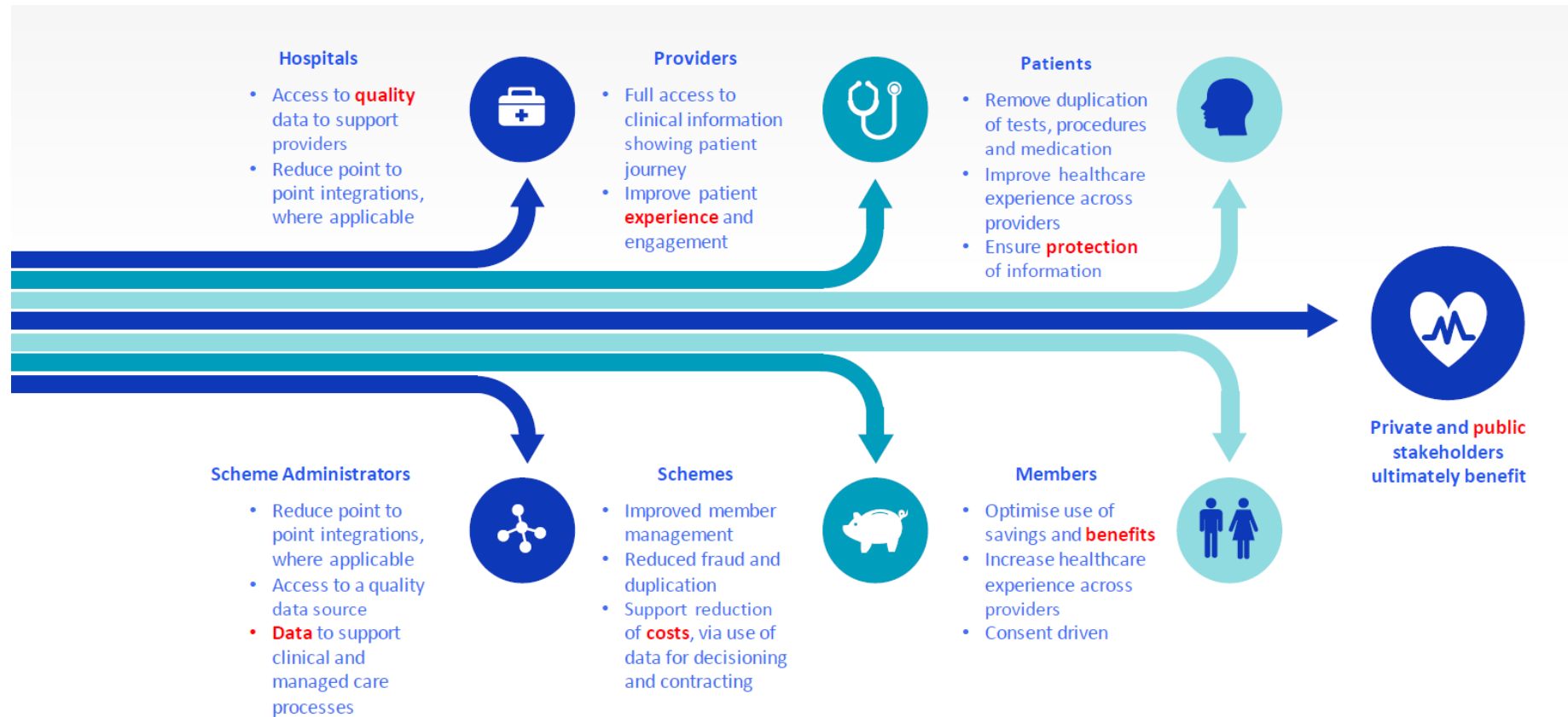
✓ Auto matching

LINKAGE DEFINITION THRESHOLD ADJUSTER



✗ Weak links, no match

Benefits





Innovation at the Bedside

Operationalizing Analytics



29 connected systems

293 connected
interfaces

64 notification programs and
400,000+ notifications in Q2 2021

14M patients
23 hospitals
830+ outpatient facilities

API users:
33 applications
73 APIs

API volume:
43M over running
90 days

24 application solutions

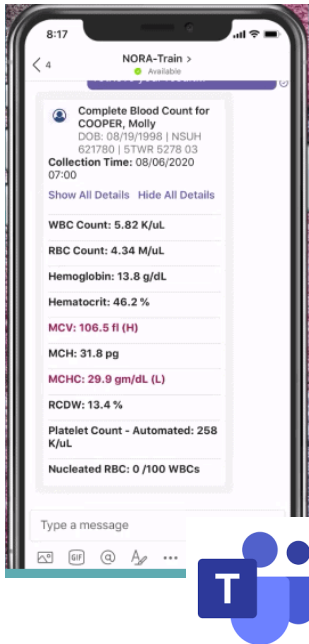
28,348 users

3M clinical viewer searches
(+trends) in 2020
2021 target: **4M+**

“A comprehensive record across our disparate systems ... was just the beginning of what’s strategically possible on our way to democratizing data”

Jim Heiman, AVP, Clinical Information Systems, Northwell Health

Virtual Assistant

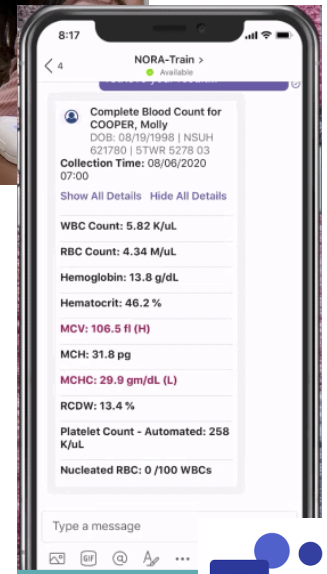
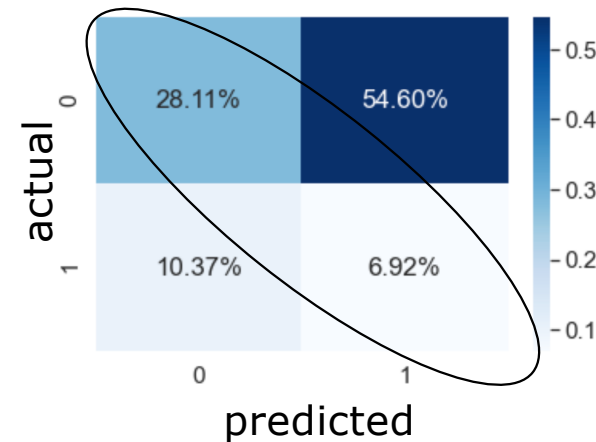
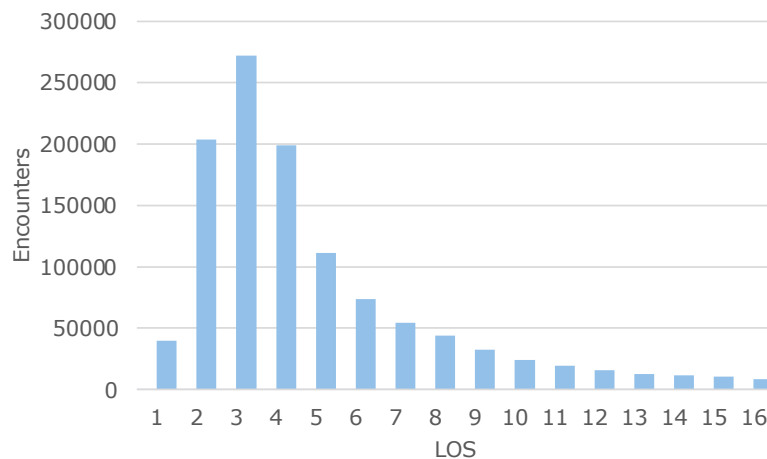


- Access Clinical Data
- Intelligent at-a-glance views
- Real time actionable alerts
- On demand risk scores and calculators
- Secure collaboration for ward rounds and care coordination
- In built predictive models



Predicting Length of Stay

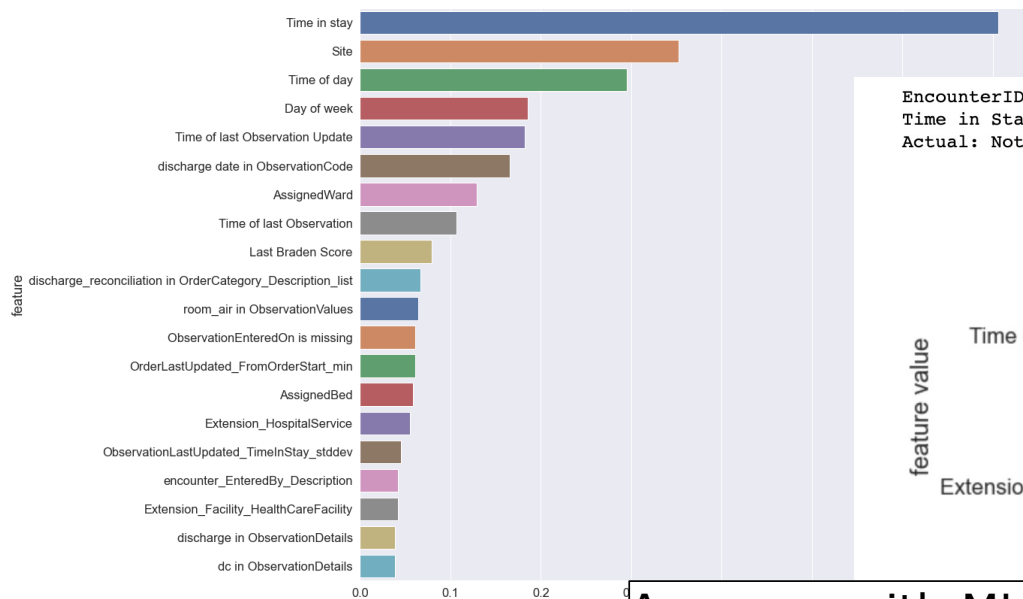
- Excess Days (Patient LOS > CMS DRG-Based LOS) costs \$10M/hospital
- Use ML to more accurately predict LOS
- Enhance Discharge Readiness App with ML Insights (label = is Discharge Today)



CMS DRG-based Prediction is only 35% Accurate on 'Is Discharge Today'

Predicting Length of Stay with ML

- Training dataset is last 4 years of inpatients
- 6 tables : Encounters (1.2M), Patients, Orders (108M), Medications (21M), CareCoordination documents (84K), Observations (745M)
- Multiply by 25 columns each, you have about 22 billion raw data points before ML explosion

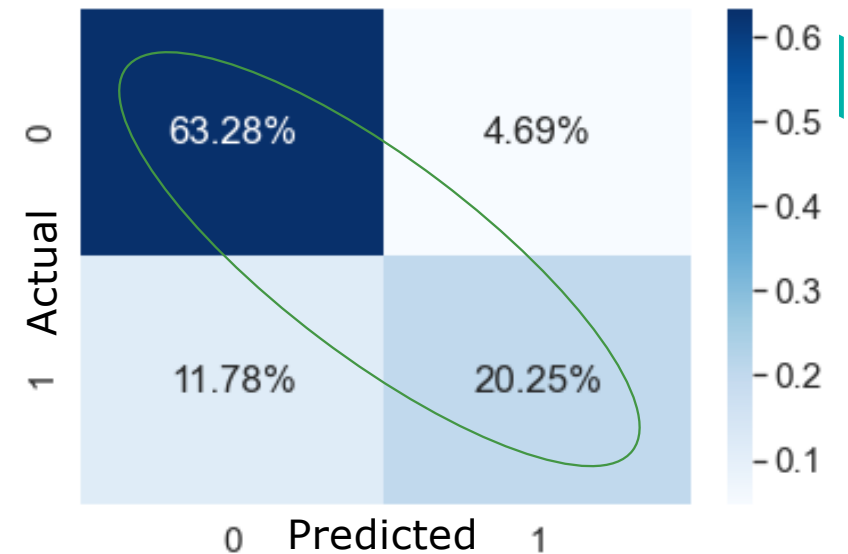
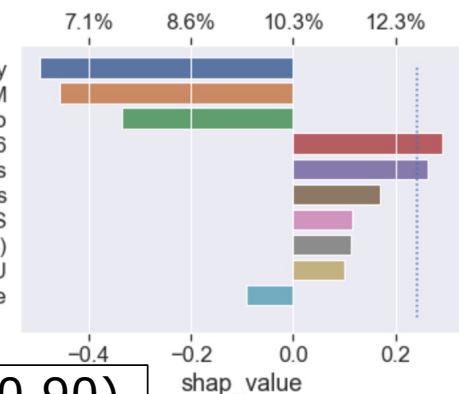


EncounterID 600049290444
Time in Stay 0.8 days
Actual: Not discharged that day

feature value

Day of week = Sunday
Time of day = 2:01PM
Time of last Observation Update = 11 hours ago
Site = 1376
Time in stay = 20 hours
No Braden Scores
AssignedWard = N4S
laboratory in OrderDetails (11 times)
Extension_Facility_HealthCareFacility = SSU^SSU
discharge date not in ObservationCode

Probability=12.8%, Prediction=No Discharge Today



Accuracy with ML is = 84% (AUC=0.90)



Thank you

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