



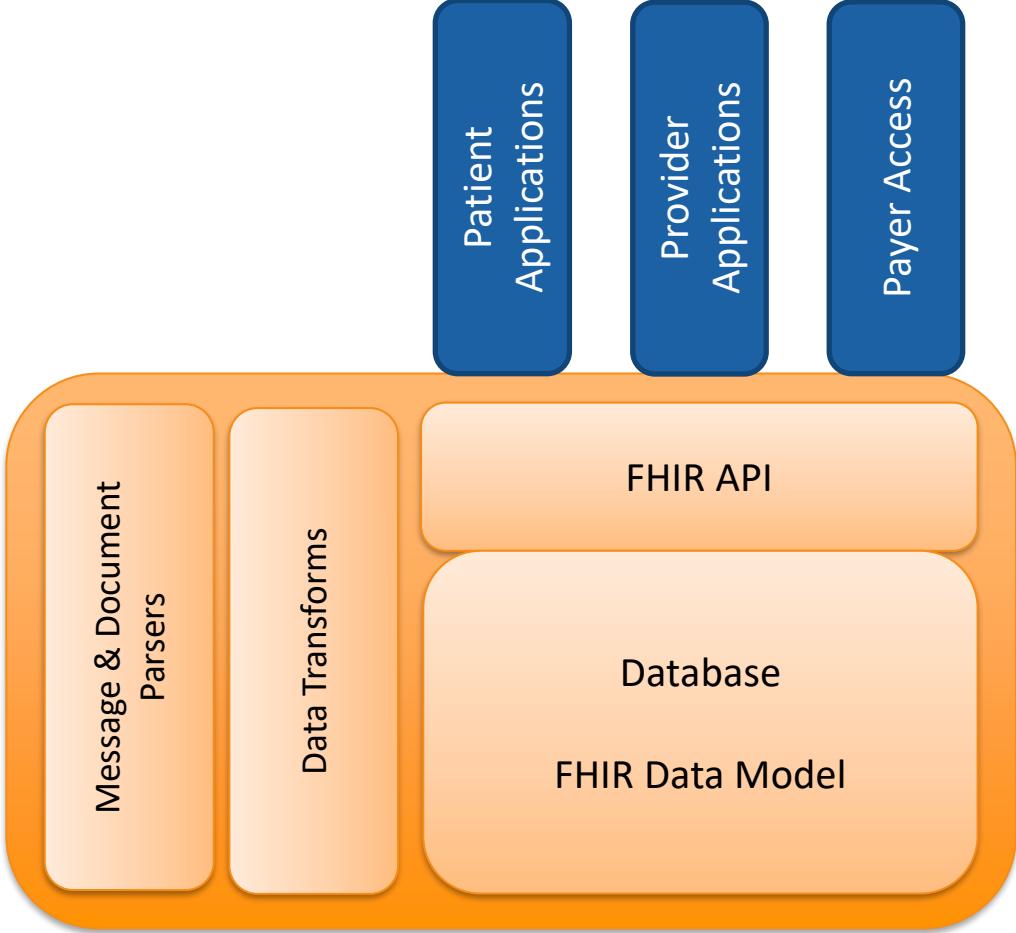
FHIR Advancing Clinical and Pharma Research

August 18, 2020

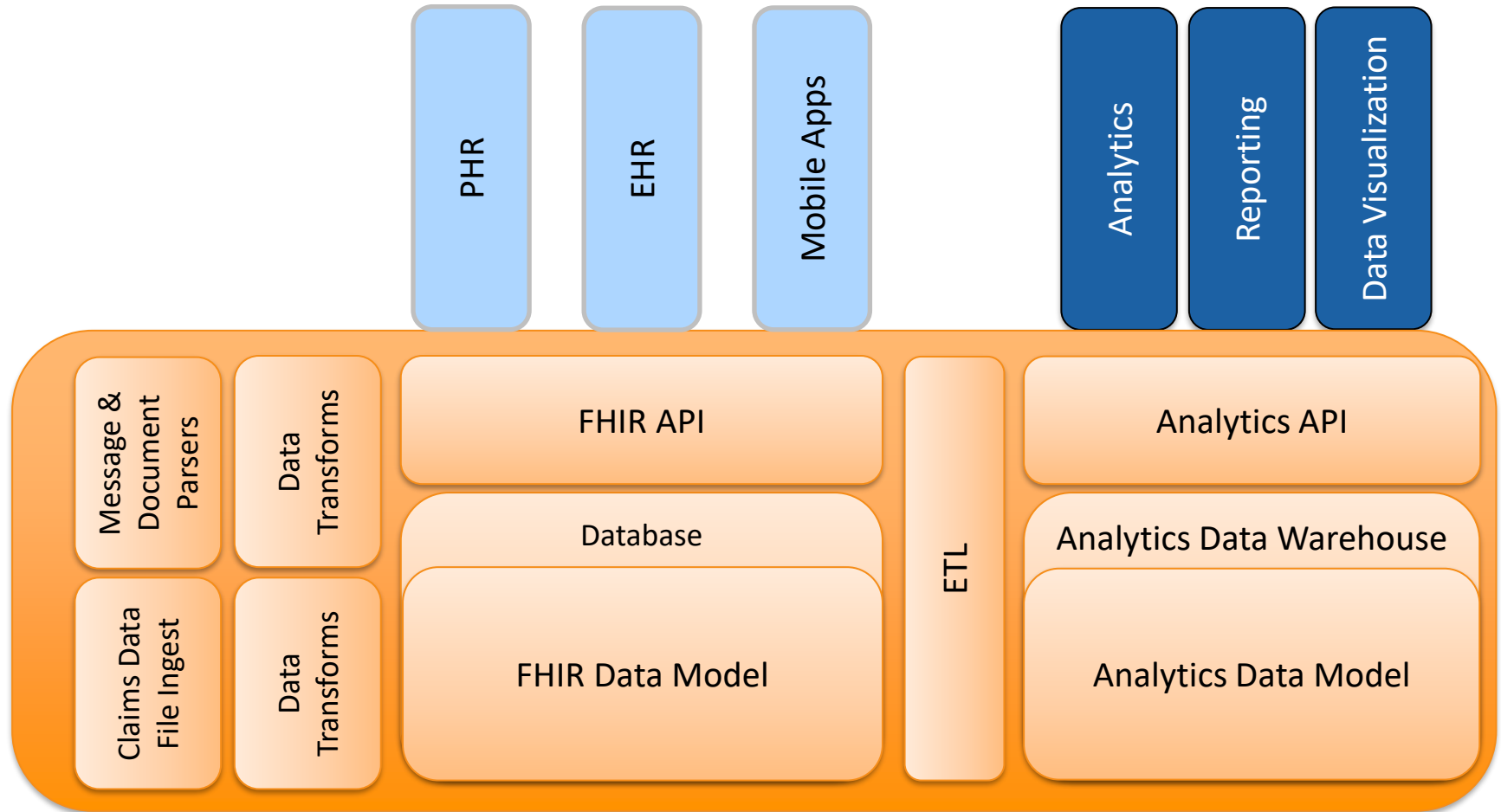
Terri Lynn Palmer
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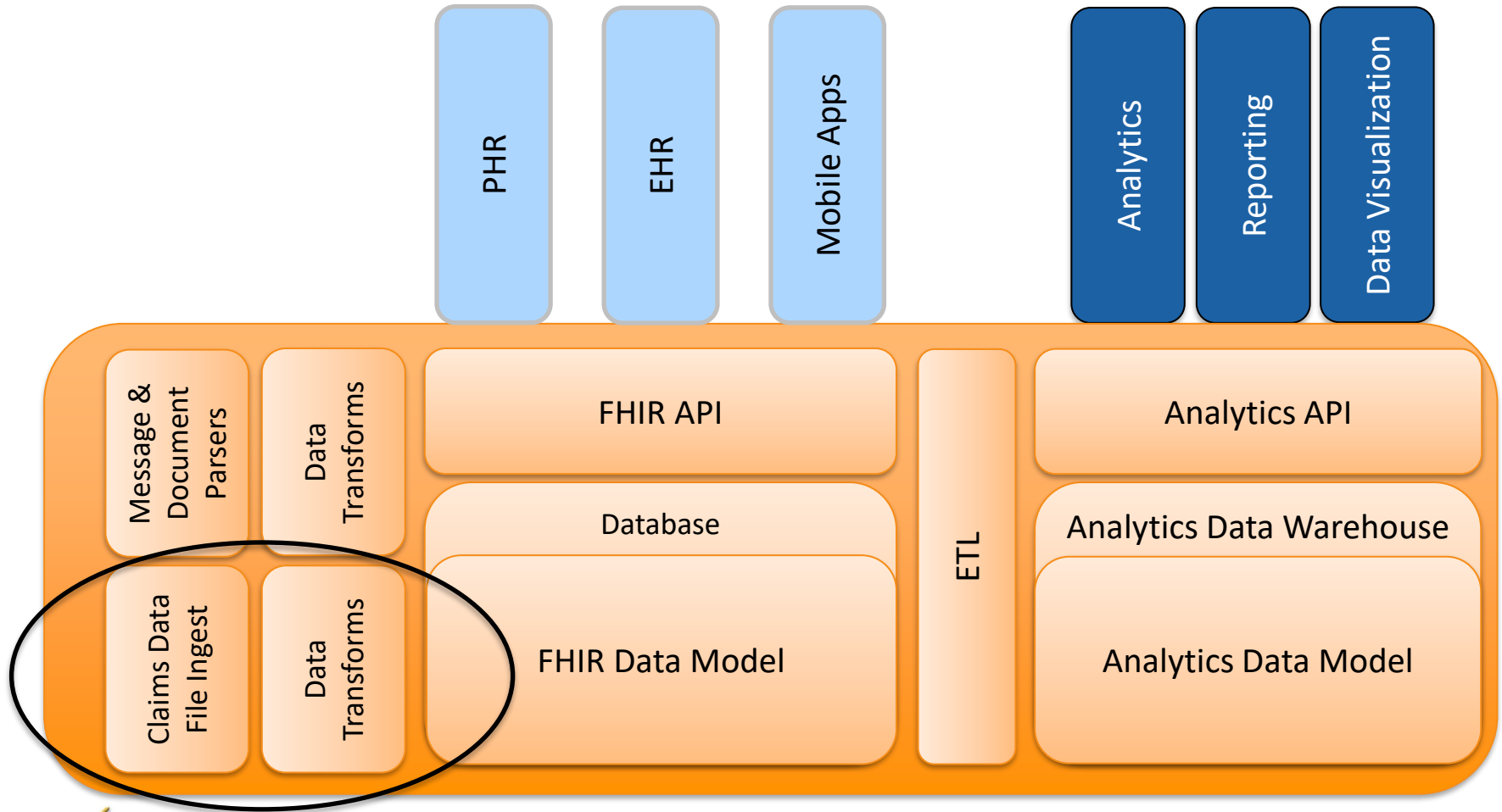
Native FHIR Clinical Data Repository



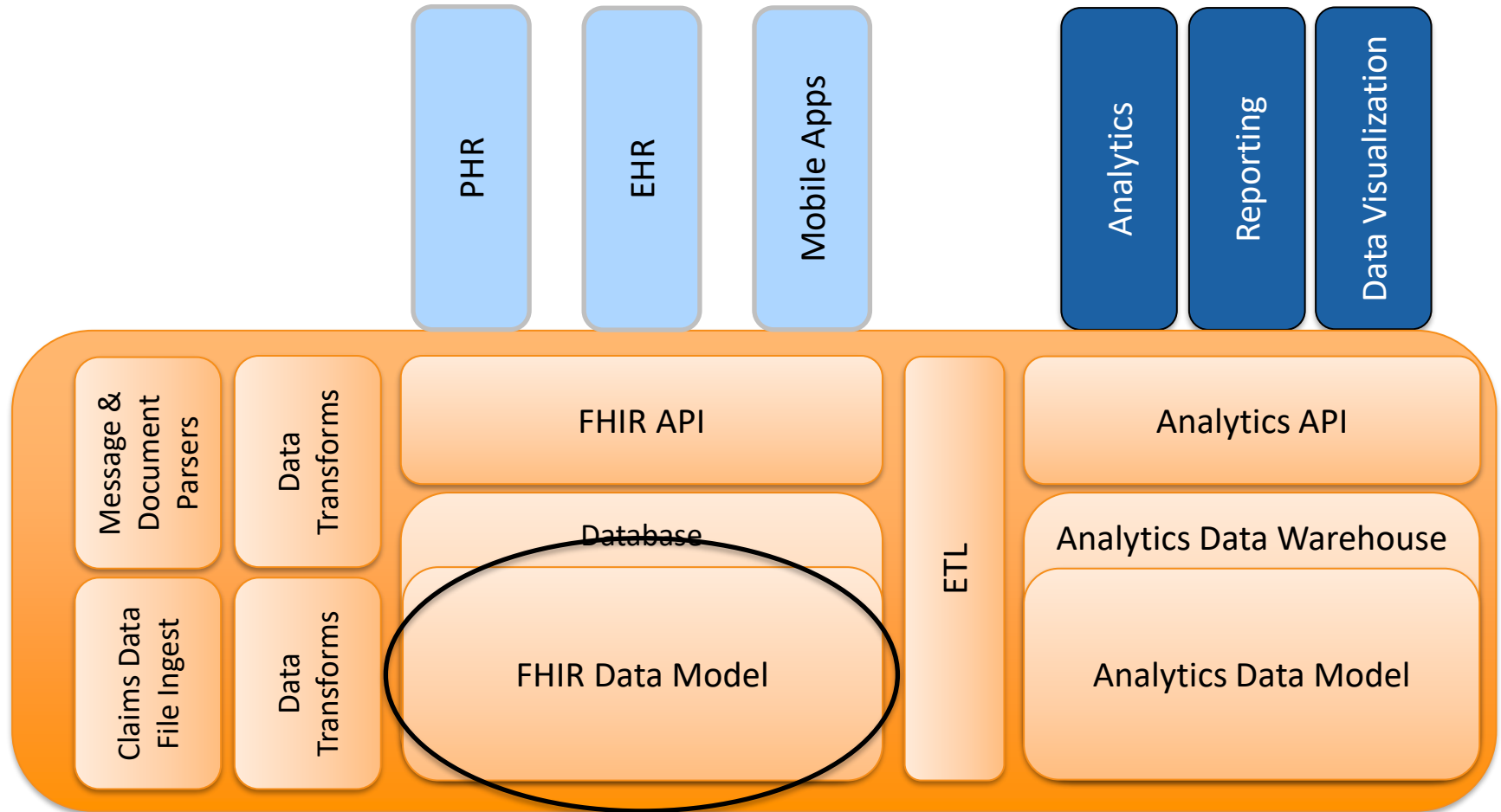
Native FHIR Platform Architecture



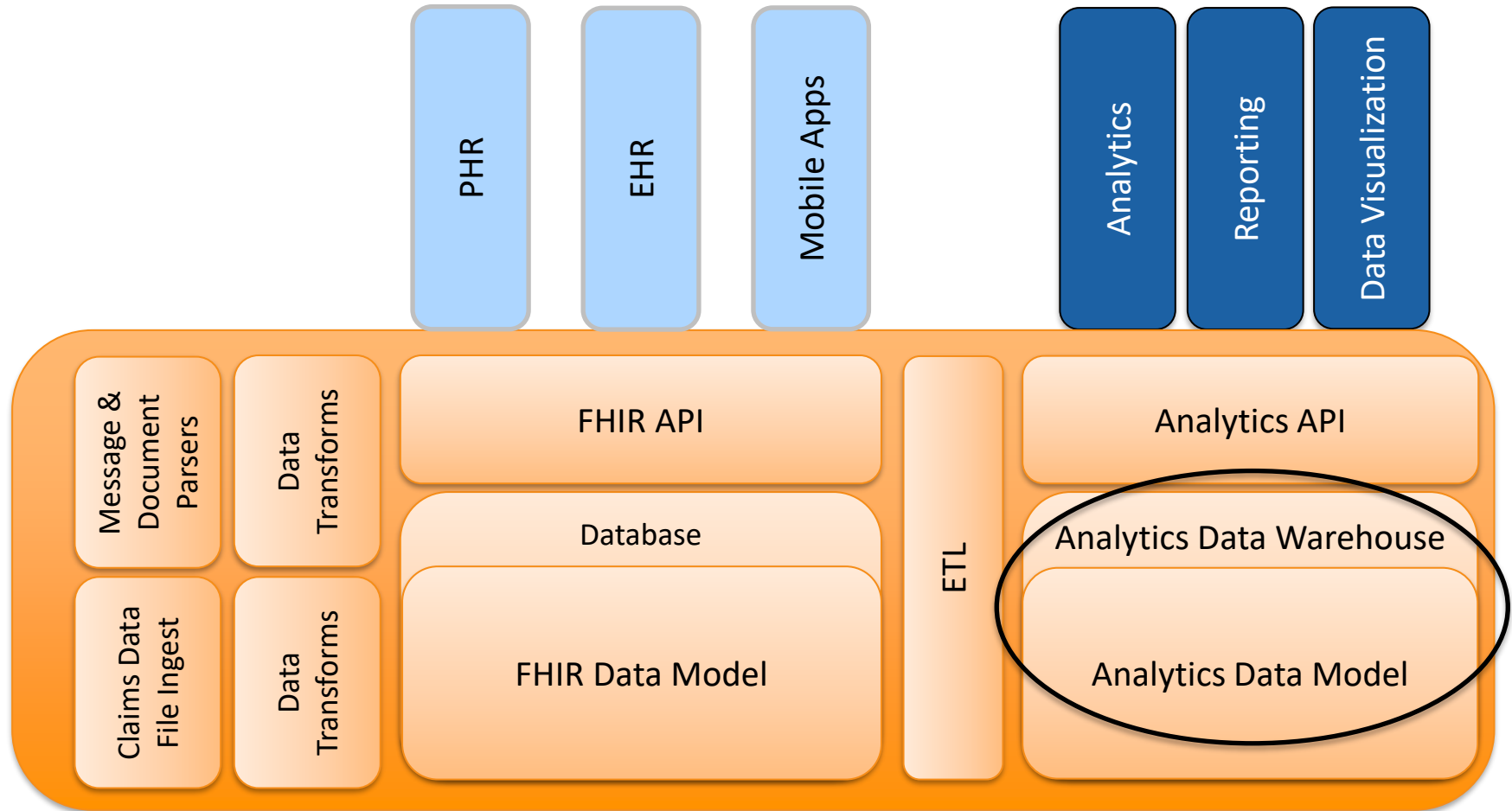
Native FHIR Platform Architecture



Native FHIR Platform Architecture



Native FHIR Platform Architecture



Delaware Health Information Network

- A statutory (16 *Del. C. Ch. 103*) not-for-profit instrumentality of the State of Delaware
- Statutory mission is to develop and operate a state-wide health information network integrating clinical, financial, and patient satisfaction data sources (16 *Del. C. § 10303*).
- In 2016, Senate Bill 238 authorized DHIN to establish a state-wide Health Care Claims Database (HCCD).



- *The DHIN is intended by law to be a public-private partnership for the benefit of all citizens of Delaware.*

FHIR Platform fit for DHIN











- “Data is more valuable in the presence of other data.” - RP Gaboriault
 - Few organizations have DHIN’s breadth and depth of aggregated and curated health data.
- “FHIR data platform is flexible enough to support the needs of one provider or entity or a thousand, located in a variety of facilities, anywhere.” - H. Figge
 - DHIN’s FHIR Platform makes our data system available and scalable.

Breadth and Depth of Data

Acute Care Hospitals							
Name:	Delivering Results Since:	Results Type:					
		General Labs	Microbiology	Radiology	Pathology	Transcription	ADT's (Admission, Discharge and Transfer) Summaries
	2013	✓	✓	✓	✓	✓	✓
	2007	✓	✓	✓	✓	✓	✓
	2007	✓	✓	✓	✓	✓	✓
	2007	✓	✓	✓	✓	✓	✓
	2013	✓	✓	✓	✓	✓	✓
	2012	✓	✓	✓	✓	✗	✓
	2016	✓	✓	✓	✓	✓	✓
	2009	✓	✓	✓	✓	✓	✓
	2015	✓	✓	✓	✓	✓	✓

Urgent Care Centers/Walk-In Clinics				
Name:	Delivering Results Since:	Results Type:		
		Transcription	ADT's (Admission, Discharge and Transfer) Summaries	Care Summaries
	2016	✓	✓	✓
	2016	✗	✓	✓
	2016	✓	✓	✓
	2016	✓	✓	✓
	2017	✗	✓	✓
	2017	✓	✓	✗

Breadth and Depth of Data

Labs				
Name:	Delivering Results Since:	Labs		
		General Labs	Microbiology	Pathology
	2013	✓	✓	✗
	2019	✗	✗	✓
	2008	✓	✓	✓
	2007	✓	✓	✓
	COMING SOON	COMING SOON	COMING SOON	COMING SOON
	2007	✓	✓	✗
	2016	✓	✓	✗
	COMING SOON	COMING SOON	COMING SOON	COMING SOON
	2008	✓	✓	✗
	2015	✓	✓	✗
	2017	✓	✓	✗
	2017	✓	✗	✓
	2020	✗	✗	✓

Radiology Firms		
Name:	Delivering Results Since:	Results Type:
		Radiology
	2012	✓
	2016	✓
	2014	✓
	2018	✓
	2018	✓
	2013	✓
	2013	✓
	2016	✓
	2016	✓
	2015	✓
	2017	✓

Breadth and Depth of Data

Other Data Senders				
Name:	Delivering Results Since:	Results Type:		
		Transcription	ADT's (Admission, Discharge and Transfer) Summaries	Care Summaries
	2014	x	✓	x
MDLIVE	2017	x	✓	Coming Soon
AMERICAN WELL	2017	x	✓	Coming Soon
	2017	x	✓	x
NJSHINE	2017	x	✓	x

Data Services Available

Provider Services

Electronic Clinical Results Delivery

DHIN-to-EHR Integrations

Care Summary Exchange

Clinical Gateway

Community Health Record

Event Notification System

Medication History

PACS Image Sharing

DHIN Electronic Public Health Reporting

DHIN Electronic Syndromic Surveillance

DHIN Immunization Registry and Reporting

Future: Mental /Behavioral Health Data

Future: New data types and data sources

Consumer Services

State-wide Patient
Portal/Personal Health Record
(PHR)

DHIN Clinical Trial Sourcing

Specimen Location for Research

Fraud Detection

Medical Orders for End-of-Life
Care

Analytics

Services

*Clinical and
Claims Data*

Health Care Claims Database

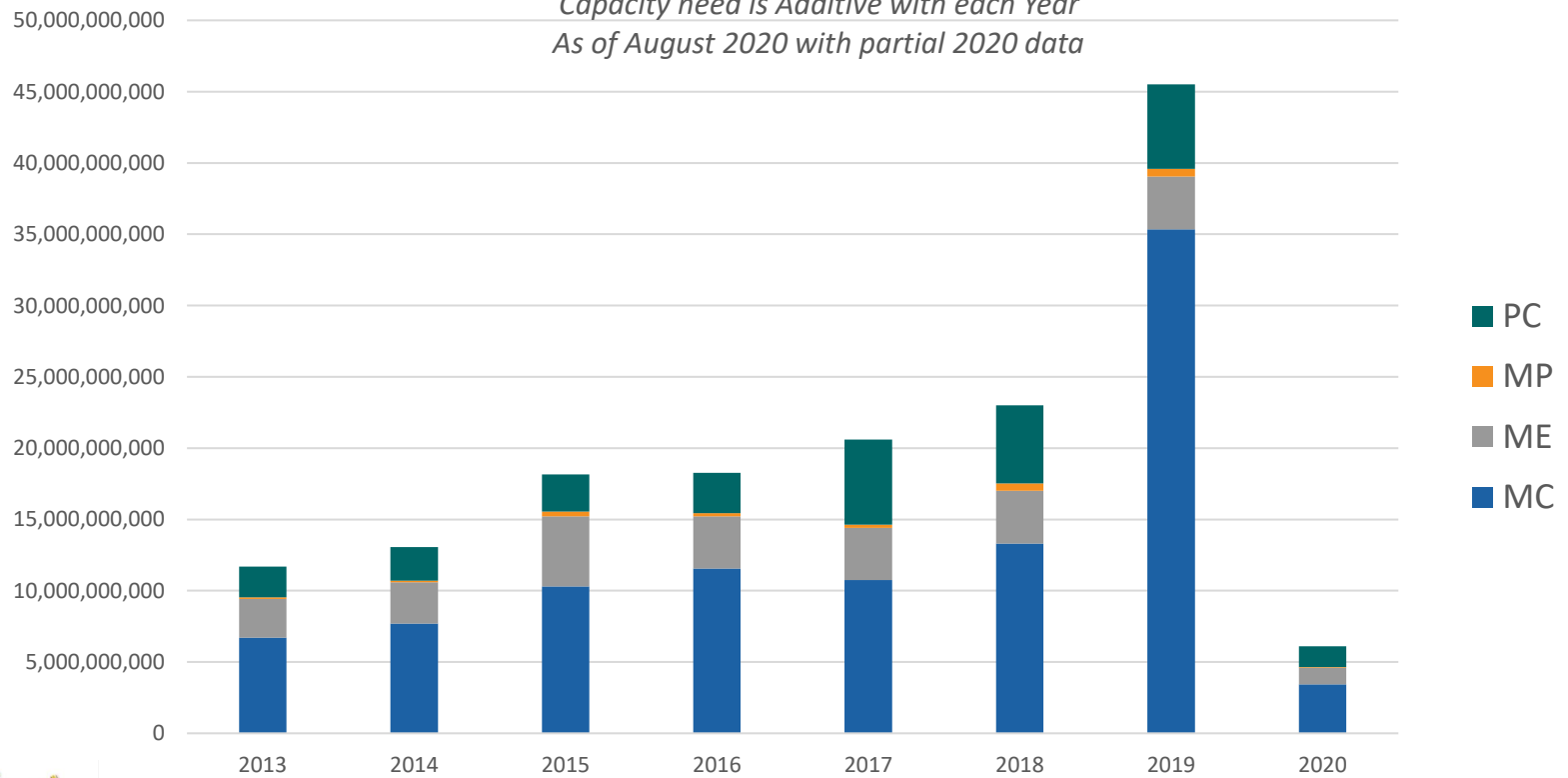
	2013	2014	2015	2016	2017	2018	1-2Q19	3Q19	4Q19	1Q20	Apr 20
Aetna	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Aetna Med	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Cigna Part 1	Gray	Gray	Green	Green	Green	Green	Green	Green	Light Orange	Yellow	Yellow
Cigna Part 2	Gray	Gray	Gray	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Light Orange	Yellow	Yellow
CVS	Gray	Gray	Green	Gray	Green	Green	Green	Green	Green	Green	Green
DMMA	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
DMMA DPCI	Green	Green	Green	Green	Green	Green	Green	Gray	Gray	Gray	Gray
DMMA UHC	Green	Green	Green	Green	Green	Green	Green	Gray	Gray	Gray	Gray
Express Scripts	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Highmark Part 1 (original LOBs)	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Highmark Part 2 (MCO)	Gray	Gray	Green	Green	Green	Green	Green	Green	Green	Gray	Gray
Highmark Part 3 (commercial)	Gray	Gray	Green	Green	Green	Green	Green	Green	Green	Gray	Gray
Humana	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
United	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
UHG	Gray	Gray	Green	Yellow	Green	Green	Green	Green	Green	Green	Green
AmeriHealth	Gray	Gray	Gray	Gray	Gray	Green	Green	Green	Green	Green	Green
Medicare FFS (CMS)	Green	Green	Green	Green	Yellow	Yellow	Green	Green	Green	Green	Green
Optum Catamaran	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

Light yellow = staging; Yellow = level 1; Light Orange = Versioning
 Orange = Level 2; Green = Data Warehouse Production; Gray = N/A

Health Care Claims Database

HCCD Capacity Need for Production Data

*Capacity need is Additive with each Year
As of August 2020 with partial 2020 data*



Analytic Services

- Provide data extracts, analysis and reports for diverse healthcare needs
- Support use cases for
 - healthcare reimbursement
 - value-based care
 - quality reporting
 - population health
- Include Clinical and Claims data
 - Apply data enhancements, e.g. risk adjustment, episode grpr
 - Maintain Controlled Access
 - An enterprise unique identifier
 - Utilize FHIR for improved data accessibility
- Formal application Process with Committee

Analytic Services

REQUESTING ORG NAME	PROJECT TITLE	Data Type - Clinical, Claims or Both	Application Date	ACCESS COMMITTEE DECISION
Centers for Disease Control	Environmental Health Project	Both	6/20/2019	Approved
Public Health	DE Lung Cancer Costs at Each Stage	HCCD	7/2/2019	NA
State Employee Benefits (SEBC)	RAND Hospital Transparency Study	HCCD	9/12/2019	Approved
DE Health Care Commission	Delaware Primary Care Assessment 2019	HCCD	10/7/2019	Approved
State Council for Persons with Disabilities (SCPD)	Brain Trauma Services Study	HCCD	10/22/2019	NA
DE Medicaid (DMMA)	Reporting Extract – IAPD	HCCD	12/15/2019	NA
Public Health	HPV Assessmet 11-12 yr olds	HCCD	12/27/2019	NA
ChristianaCare Health System	Impact of a Community-Based Neurocognitive Screening Program	HCCD	2/14/2020	Approved
Dept of Justice	Provider report for Child Deaths	HCCD	3/27/2020	Approved
NTT Data Services	Understanding of Chronic Disease mechanism and predict chronic disease progression using claims data	HCCD	5/27/2020	Denied;
DE Health Care Commission	Total Cost of Care (TCOC)	HCCD	5/29/2020	NA
Special Council for Persons with Disabilities	Brain Trauma Commission - TBI Prevalence and Incidence of Injury	HCCD	6/12/2020	NA
Public Health	COVID-19 Underlying Conditions	Both	7/9/2020	NA
Dept of Insurance	Reimbursement variation assessment	HCCD	7/30/2020	NA
Dept of Insurance	Trends in Cost and Utilization by Care Setting and Service Line	HCCD	8/7/2020	NA

Combined Clinical and Claims Analytics

Data Extract for COVID-19 Underlying Conditions Study

1. Customer Specification Inputs

- 579 persons of interest (POI)
- 653 diagnoses of interest (DOI)

2. Analytic Output

	Clinical	Claims	Found in both?
Persons of interest (POI) found in data	568	304	
POI records	11,784	210	
all Diagnoses of all POI	115,364		
POI records with Diagnoses of Interest*	14,271	74	

Combined Clinical and Claims Analytics

Data Extract for CDC Environmental Condition Impact

1. Customer Specification Inputs

- 25 diagnoses of interest (DOI)
- 5 zipcodes of interest
- 6 year period
- Claims data and Clinical lab results

2. Analytic Outputs

- Use of Master Patient Index converted to Unique ID Hash
 - Enables person matching across the data types
 - a unique Study person ID hash provides a de-identified longitudinal view across clinical and claims data
- Persons from Claims with Diagnoses of Interest in zipcodes of interest
- Matched claims persons to Clinical data to extract detailed Labs of Interest from clinical data

Public Reports

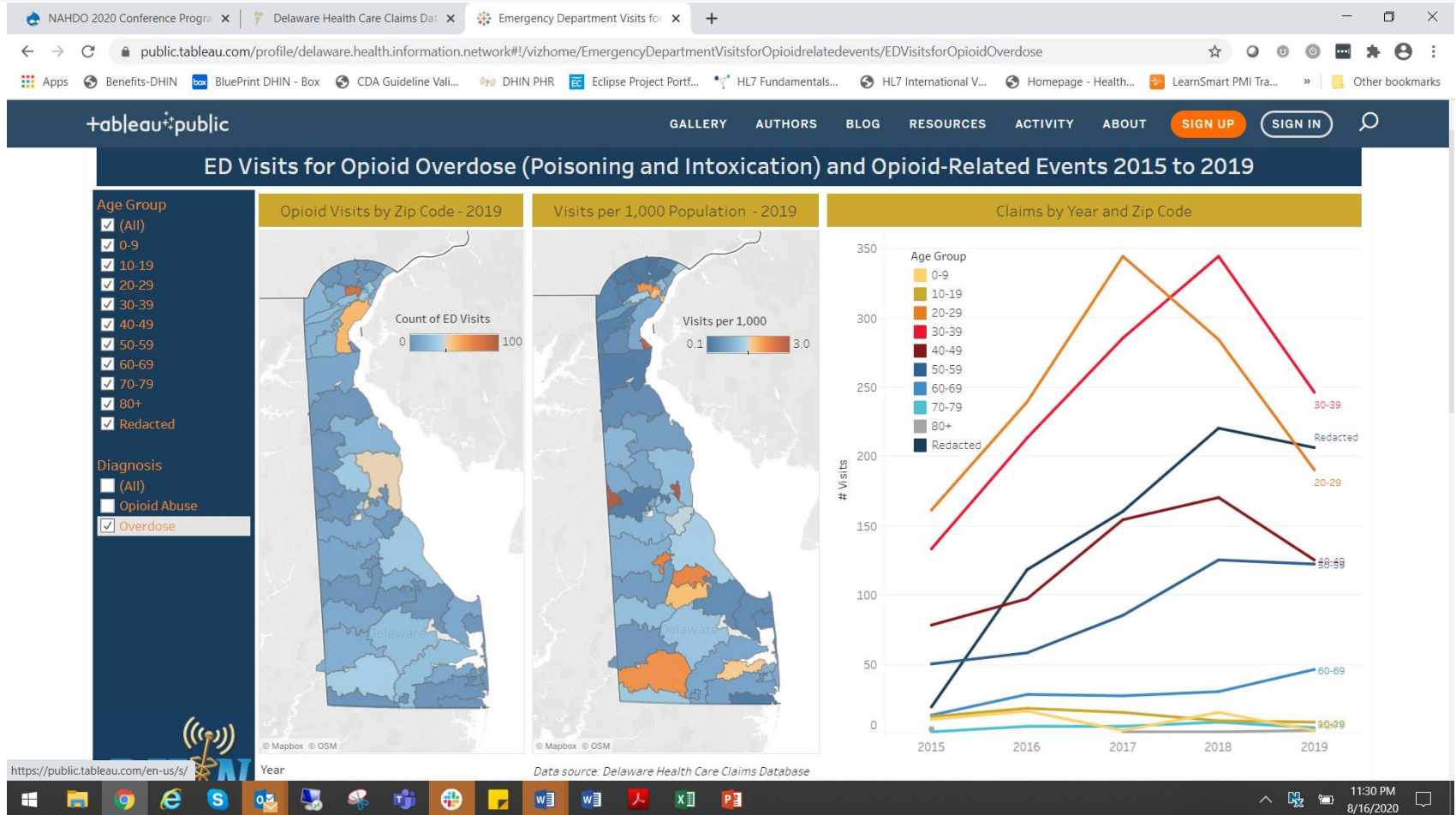
The screenshot shows a web browser window displaying the Tableau Public profile for the Delaware Health Information Network. The browser tabs include 'NAHDO 2020 Conference Progr...', 'Delaware Health Care Claims Dat...', and 'Delaware Health Information Net...'. The address bar shows the URL 'public.tableau.com/profile/delaware.health.information.network#/'. The navigation bar includes 'GALLERY', 'AUTHORS', 'BLOG', 'RESOURCES', 'ACTIVITY', 'ABOUT', 'SIGN UP', and 'SIGN IN'. The profile header features the DHIN logo, the name 'Delaware Health Information Network', location 'Dover, Delaware, United States', website 'dhin.org', and social media icons for Twitter, Facebook, and LinkedIn, along with a '6 vizzes' count and a 'Follow' button.

Vizzes 6

- EpiPen**: 52 views. Visualization: Trends in EpiPen and Generic Equivalent Prescribing Patterns and Cost. A bar chart showing prescribing patterns over time.
- Top Diagnoses in Delaware**: 74 views. Visualization: Top Diagnoses in Delaware (by ICD Code). A horizontal bar chart listing the top diagnoses.
- Emergency Department Visits**: 120 views. Visualization: Emergency Department Utilization. A line and bar chart showing ED utilization over time.
- Emergency Department Visits for Opioid related events**: 101 views. Visualization: ED Visits for Opioid Overdose (Prescribing and Intoxication) and Opioid Related Events: 2015 to 2019. A map of Delaware and a line chart showing related events.
- What data currently resides in the HCCD?**: Visualization: What data currently resides in the HCCD? A bar chart.
- Top Prescriptions in Delaware**: Visualization: Top Prescriptions in Delaware. A horizontal bar chart.

The Windows taskbar at the bottom shows the system tray with the time 11:27 PM and date 8/16/2020.

Public Reports



Challenges

- DHIN's uses and disclosures of data must accommodate both patient consent and data sender consent
- Master Agreements with earlier clinical data senders are either silent on analytics use case (most hospitals) or explicitly disallow use of data for research, including de-identified data,
- Permitted uses of clinical and claims data are governed by separate statutory subchapters and separate contractual agreements
- Each data sender agreement must be amended - one by one
- Low in-house resources restrict DHIN's ability to fulfill the analytic requests without sub-contractor assistance.

Analytic Services Plan

	FY21 -- Year 1	FY22 -- Year 2	FY23 -- Year 3
Primary Focus	<ul style="list-style-type: none"> • Data Enhancements • Automation • Ease of Access 	<ul style="list-style-type: none"> • Report Repertoire • Expand Customer Base 	<ul style="list-style-type: none"> • Clinical Connectivity • Expand Data Sources • Financial Sustainability
Key Activities	<ul style="list-style-type: none"> • Implement the set of internally developed and coded data enhancements per Appendix B • Develop private portal for payer data validation reports • Begin QE certification process • Define, design and deliver a data extract to the DMMA • Automate data intake and validation processes. • Complete data enhancements specific to supporting DHCC reporting milestones • Create a SQL Library and other documentation knowledge bases • Begin conversation for contracting with research organizations and Universities • Respond to SEBC RFP 	<ul style="list-style-type: none"> • Continue data enhancements per Appendix B such as completion of provider attribution enhancements • Apply a proprietary Risk Adjustment enhancement • Develop provider based quality reporting • Develop private portals for state agencies and varied users • Continue QE certification process including privacy and security assessment • Educate staff on HEDIS and NCQA measures, MACRA and MIPS • Begin HCCD value conversations with self-funded plans • Align HCC data specifications to APCD common data layout 	<ul style="list-style-type: none"> • Conduct discovery sessions with CHR and PHR users for determining Claims values • Define the project to connect claims to the CHR and PHR • Onboard data from a self-funded plans • Negotiate support level from DMMA for securing IAPD Medicaid Match dollars • Complete documentation phase of QE certification
Outcomes & Deliverables	<ul style="list-style-type: none"> • Produce a data extract for DMMA • 2 HCC reports: Utilization rates per 1,000; per Member per Month cost trends • A licensed payer portal for receipt of data quality reports • Automated file transfers and person identity matching • \$275K in earned revenue • Publish at least 5 additional public-facing reports 	<ul style="list-style-type: none"> • Private portal for a State agency for access to an approved data set • Private portal for a non-State customer to review a de-identified data set in preparation for a data extract • Health quality reports available for payers, providers, and ACOs (new customers) • Achieve HITRUST certification • Publish at least 5 additional public-facing reports 	<ul style="list-style-type: none"> • Achieve QECP certification • A published article based on HCCD data • Risk scores are an available element in the data set • Claims and clinical data are linked at the person level and clinical proxy claims elements are exposed in the clinical applications (CHR, PHR) • Enroll one or more voluntary reporting entities including at least one self-insured plan • Publish at least 5 additional public-facing reports

Summary and Next Steps

- Summary

- DHIN has a broad array of data types supporting a variety of data sources
- DHIN's FHIR Platform Architecture makes our data flexible and scalable
- Delaware's healthcare stakeholders are showing interest in DHIN's Analytic Services

- Next Steps

- Develop DHIN's Analytics as a key service for healthcare providers and consumers.
- Establish a Data Release process for Clinical data that mirrors the Claims Data Release process.
- Seek to amend Master Agreements to allow deidentified use of data
- Work with State on clarifying updates of statutory language

Thank You

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