

# Vermont Information Technology Leaders

Education Series for  
Vermont's Health Information Exchange Steering Committee  
November 23, 2020 & January 4, 2021



# Introduction to VITL and the VHIE

November 23, 2020

# Topics

- ❑ Introductions
- ❑ The Vermont Health Information Exchange
- ❑ About VITL
- ❑ How VITL serves
- ❑ Who participates
- ❑ Data & services
- ❑ Data sharing volume
- ❑ Recent projects
- ❑ What's next

# Introductions

# The Vermont Health Information Exchange

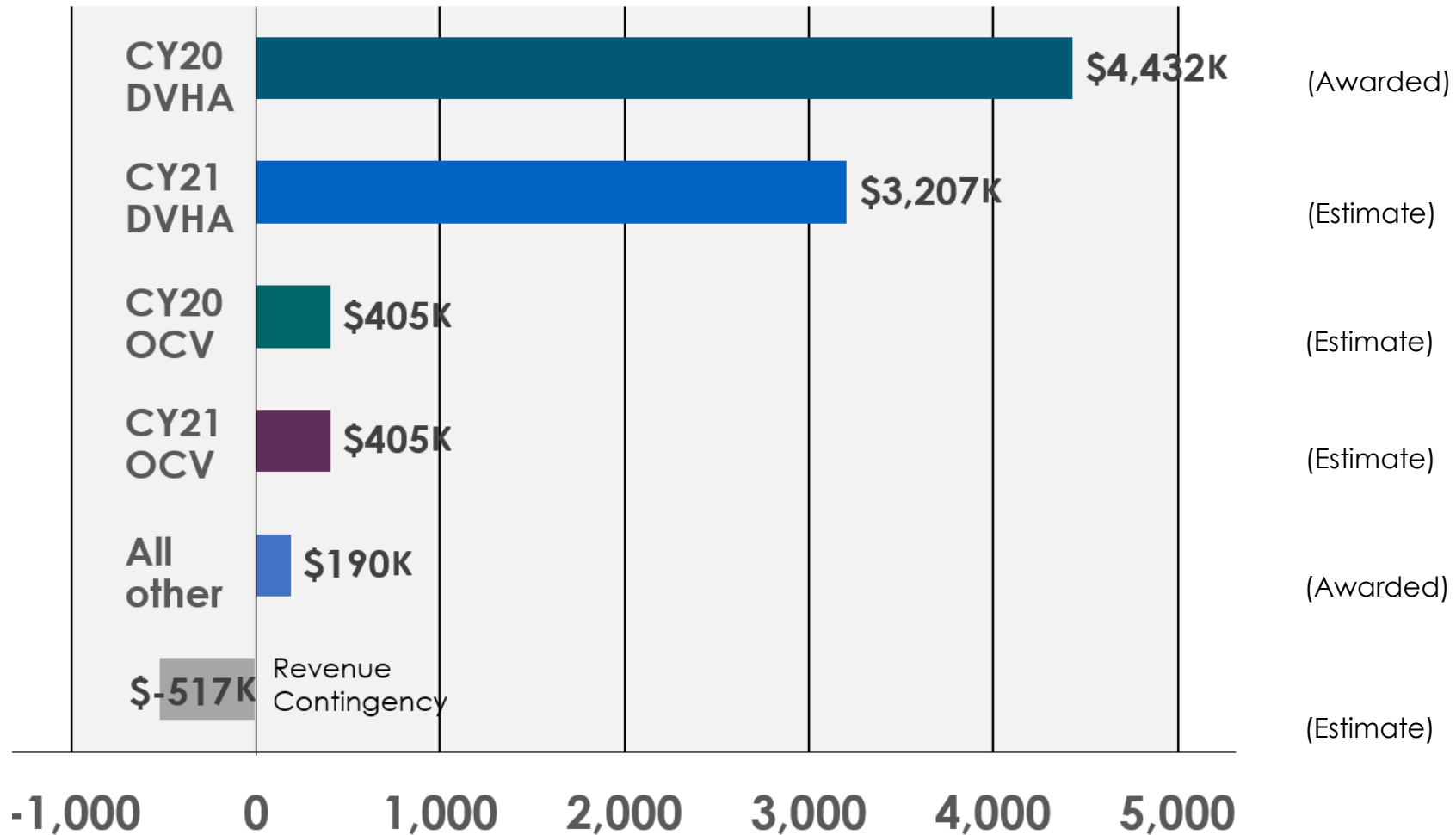
- “Electronic health information exchange (HIE) allows doctors, nurses, pharmacists, other health care providers and patients to appropriately access and securely share a patient’s vital medical information electronically —improving the speed, quality, safety and cost of patient care” (ONC)
- HIE organizations provide the technology, standards, and policies to help their stakeholders, including providers, payers, and public health, to securely share health information
- VITL is the legislatively designated operator of the Vermont Health Information Exchange

# About VITL

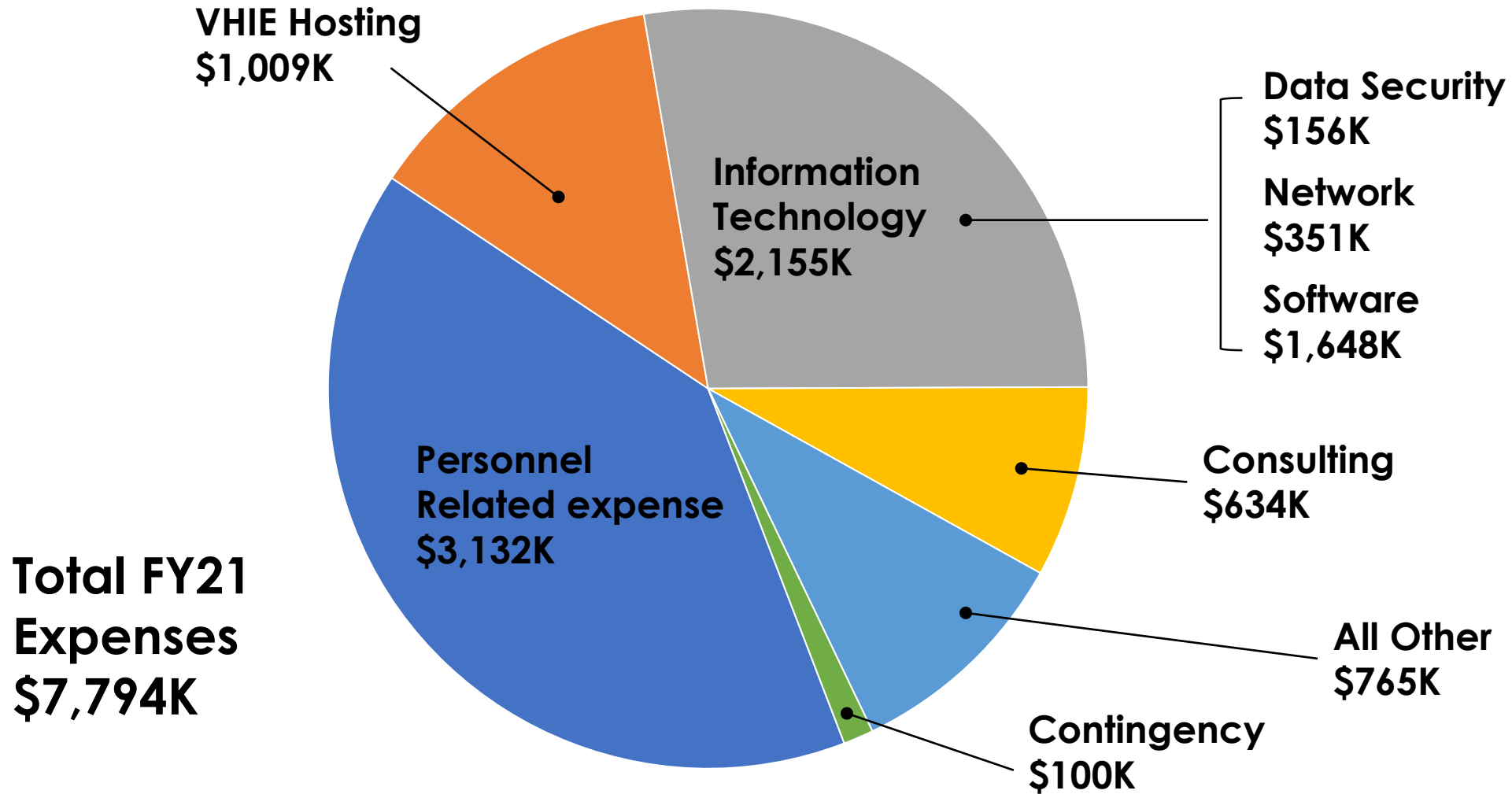
- Non-profit organization
- Based in Burlington, Vermont (remote right now)
- 24 employees, with expertise in information technology, security, operations, customer engagement, and more
- Independent Board of Directors with diverse experience spanning clinical care, health care administration and data systems leadership, business and entrepreneurship

# FY21 Budgeted Revenue

**Total FY21  
Revenue  
\$8,121K**



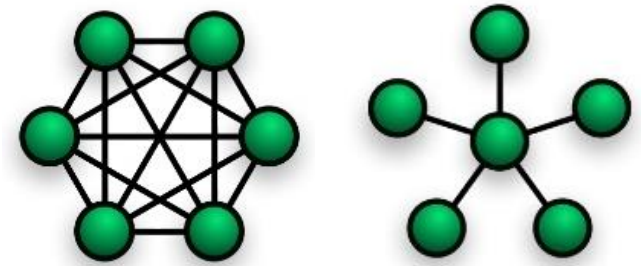
# FY21 Budgeted Expenses





# How VITL Serves

- Create one health record for every person
  - Getting closer to the whole picture of a patient's health – for better informed, safer, more effective care
- Improve health care operations
  - More timely data
  - Data access with less administrative burden
  - VHIIE is a data hub, connections to the hub save sending and receiving organizations the cost and time of point-to-point connections
  - Data to support reporting, care coordination, quality improvement
- Use data to enable investment and policy decisions
  - Data to support modeling, program development, and evaluation



# VITL Participants

Federal and State agencies	3
Hospitals	17
Hospital-owned specialty and primary care practices	183
Independent practices	77
Federally Qualified Health Centers (FQHC)	10
Designated Agencies and Specialized Services Agencies	10
Home health agencies	9
Nursing homes and long-term care facilities	6
Emergency medical services (EMS/EMT)	11
Pharmacies	4
State and commercial labs	4
Total	334

Data and reporting also provided to:

- OneCare Vermont
- The Vermont Blueprint for Health
- The Vermont Chronic Care Initiative
- The Vermont Department of Health
- Veteran's Administration / Department of Defense (via eHx)
- Event notification

# Types of Data the VHIE Receives

Health care organizations can submit data to the VHIE in a variety of formats, including HL7 messages, CCD, CCDA, Fast Healthcare Interoperability Resources (FHIR) or flat files.

- Admission, discharge, and transfer (ADT) messages
- Continuity of care documents (CCD)
- Laboratory results – test results and COVID-19 public health reportable results
- Radiology reports
- Pathology reports
- Transcribed reports
- Immunization messages (including from pharmacies)
- Home health monitoring
- Pharmacy fill information from a national network of pharmacies
- eHealth Exchange – patient data to and from a national network

# Services: Data Access

- **VITLAccess and VITLAccess single sign-on**  
VITL's secure, web-based provider portal for viewing patient data in the VHIE and from national data sharing networks
- **Laboratory results, radiology reports, transcribed reports**  
Delivered directly into an EHR from one or more sending hospitals or labs. Transcribed reports include discharge summaries, procedure notes, specialists' reports, pathology reports, and more.
- **Cross Community Access and national networks**  
A way to query the VHIE and national networks directly from an EHR, opportunity to download into the local patient record
- **Fast Healthcare Interoperability Resources (FHIR)**  
Beginning in 2021, VITL will support direct access from an EHR to the VHIE through FHIR application programming interfaces (APIS)

# Services: Health Systems Quality & Efficiency

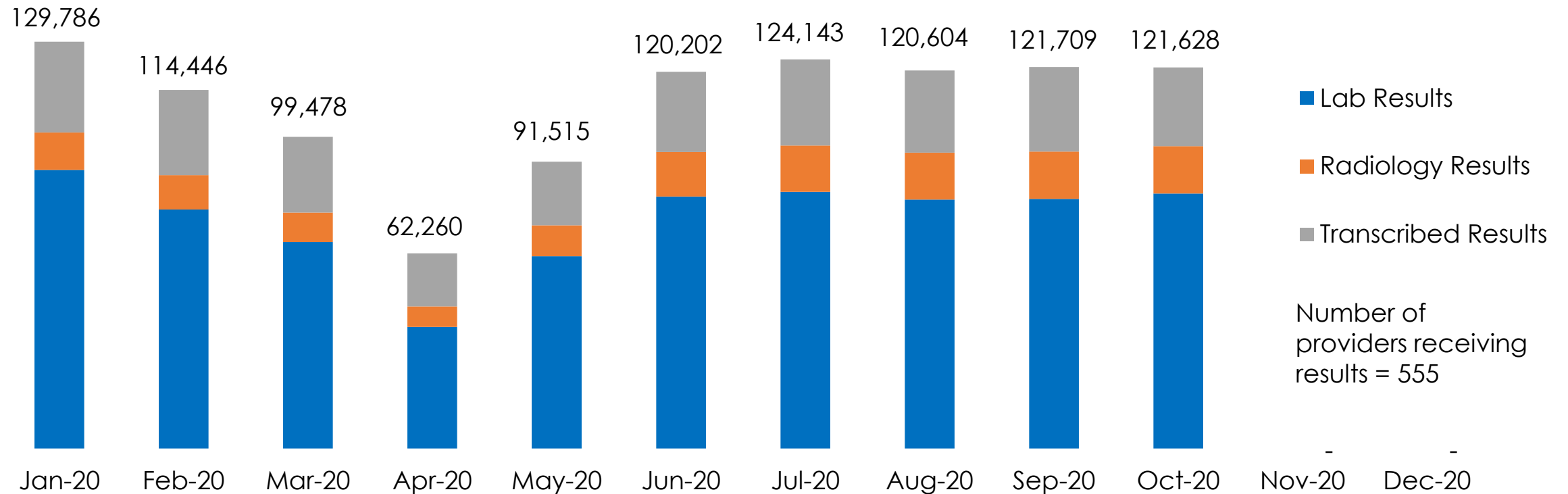
- **OneCare Vermont Accountable Care Organization**  
Data submission to OneCare, from participating health care organizations, about OneCare beneficiaries
- **Vermont Blueprint for Health**  
Clinical data provided to the Blueprint to support federal reporting, state data products, incentive payments
- **Vermont Chronic Care Initiative**  
Clinical data on Medicaid beneficiaries to support identification of high risk individuals and care coordination
- **Public Health**  
Data to support contagious disease reporting, syndromic surveillance, evaluation of health equity
- **Vermont Immunization Registry**  
Automated collection of immunization data from health care organizations for monitoring purposes
- **Event Notification**  
Opportunity to subscribe to third party tools to receive alerts on patient populations based on Admission, Discharge, and Transfer events submitted to the VHIE; opportunity for hospitals to provide alerts to meet Medicare conditions of participation

# Volume of Data

# Services Subscriptions

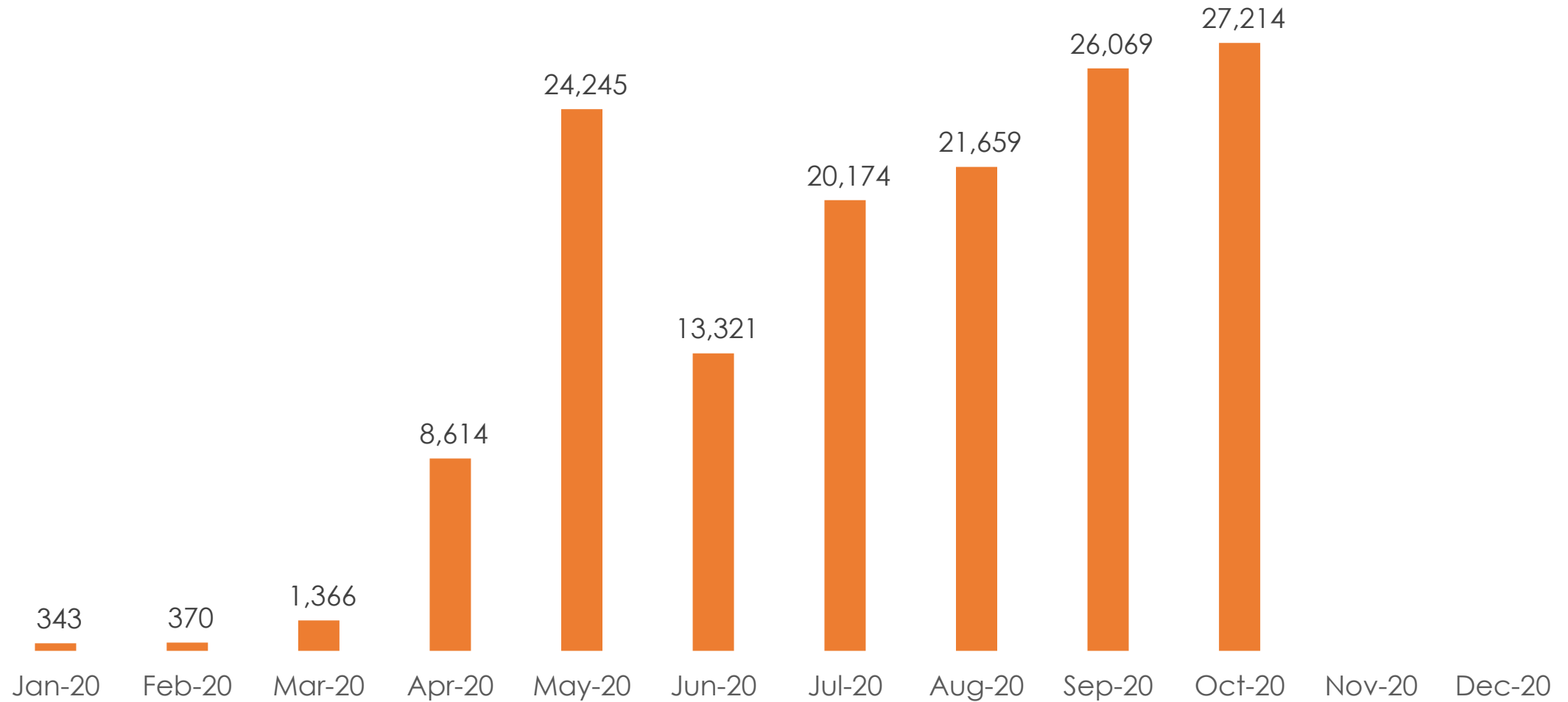
	Any Service	Sending Services	Access Services	VITLAccess
Federal and State agencies	3	1	2	3
Hospitals	17	17	1	9
Hospital-owned specialty and primary care practices	183	174	27	39
Independent practices	77	31	22	54
Federally Qualified Health Centers (FQHC)	10	10	7	5
Designated Agencies and Specialized Services Agencies	10		3	8
Home health agencies	9	8		9
Nursing homes and long-term care facilities	6		2	3
Emergency medical services (EMS/EMT)	11			11
Pharmacies	4	4		
State and commercial labs	4	4		
Total	334	249	64	141

# Results Delivery by Result Type

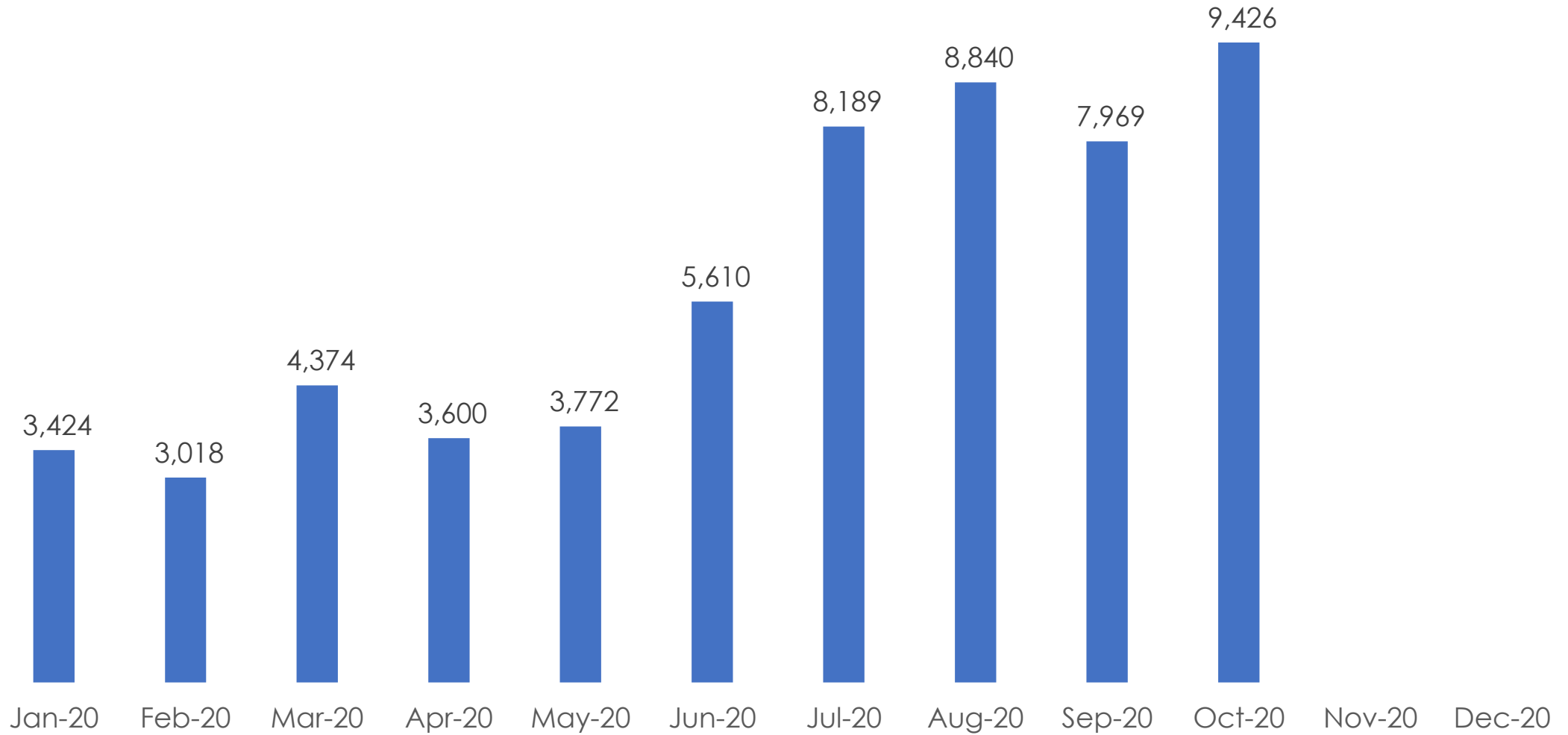




# Queries of the VHIE via National Networks



# VITL Access Queries





# 1,490,074

## PROVIDER RESULTS DELIVERED

The number of electronic clinical messages containing laboratory, radiology and transcribed report results sent from the Vermont Health Information Exchange (VHIE), and delivered seamlessly to provider electronic health records.



# 1,143

## VHIE CONNECTIONS

The number of electronic connections (interfaces) with health care organizations that are currently sending patient information to and from the VHIE.



# 935

## PATIENT CONSENT AUDITS

The number of audits performed by VITL to ensure patient privacy, security and appropriate use of the VHIE.



# 41,245

## PATIENT RECORDS ACCESSED

The number of patient records accessed via the VITLAccess provider portal, single sign-on, or cross-community access such as the U.S. Department of Veterans Affairs.

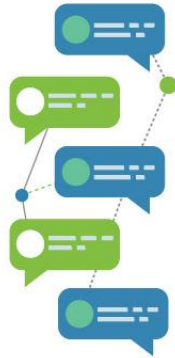
# VITL 2019 Annual Report



# 967.25

## MEANINGFUL USE/SECURITY RISK ASSESSMENT HOURS

The number hours dedicated to healthcare organizations to assist with interpreting criteria, improving data quality, and targeting data collection to meet government standards.



# 169,473,958

## VHIE MESSAGES SENT

The total number of electronic messages with patient information were transmitted to the VHIE for use at the point of care, and exited the VHIE to other health care partners such as OneCare Vermont, the VT Clinical Registry, the VT Chronic Care Initiative, and the Vermont Department of Health.



# 99.5%

## VHIE AVAILABILITY

The percentage of time that the VHIE was online and available to its users.

# Projects: COVID-19 & VDH

## Covid-19 response work in partnership with the Department of Health (VDH) and Agency of Digital Services

- Providing access to **patient data** for syndromic surveillance and contact tracing
- Automating data capture for daily **hospital reporting** to the Department of Health and the federal Health and Human Services agency to monitor hospitalizations and resource usage for submission, minimizing manual data collection by hospitals and improving data quality
- Ensuring **test results** are available in the Vermont Health Information Exchange – continuing to work with the Department of Health to identify and prioritize new testing labs
- Educating emergency services agencies about the **provider portal**
- Providing custom **reports** for participating health care organizations, where requested
- Working with the Department of Health to understand needs around **immunization data**, planning and delivery

# VHIE Technical Overview

January 4, 2021

# Collaborating On Our Strategy and Technology to Improve Health Care for Vermonters

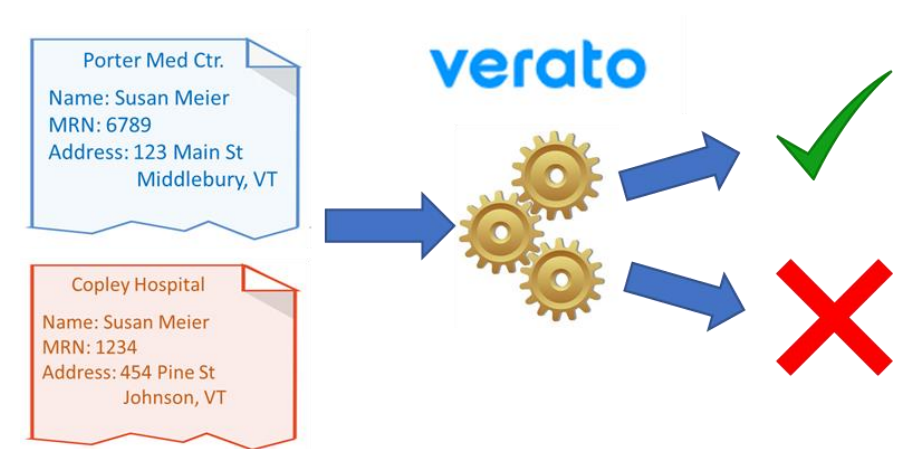


# Collaborative Services

- Much of our technology strategy is being driven by the “Collaborative Services” initiative.
- First phase is complete:
  - **Verato Master Patient Index:** best-in-class MPI capability
    - Achieving very positive match results.
    - Utilizes “referential matching” – a differentiator. Data sources outside of health care data increase match rates.
  - **Interfacing architecture redesign:**
    - Builds on VHIIE use of the Rhapsody interface engine
    - Robust capability to acquire, translate and deliver data with high reliability
  - **Terminology Services:**
    - Critical component in management of data quality
    - Supports standardization of terms needed for meaningful data analysis
- These capabilities are in place and are critical components for interoperability.

# Master Patient Index (MPI)

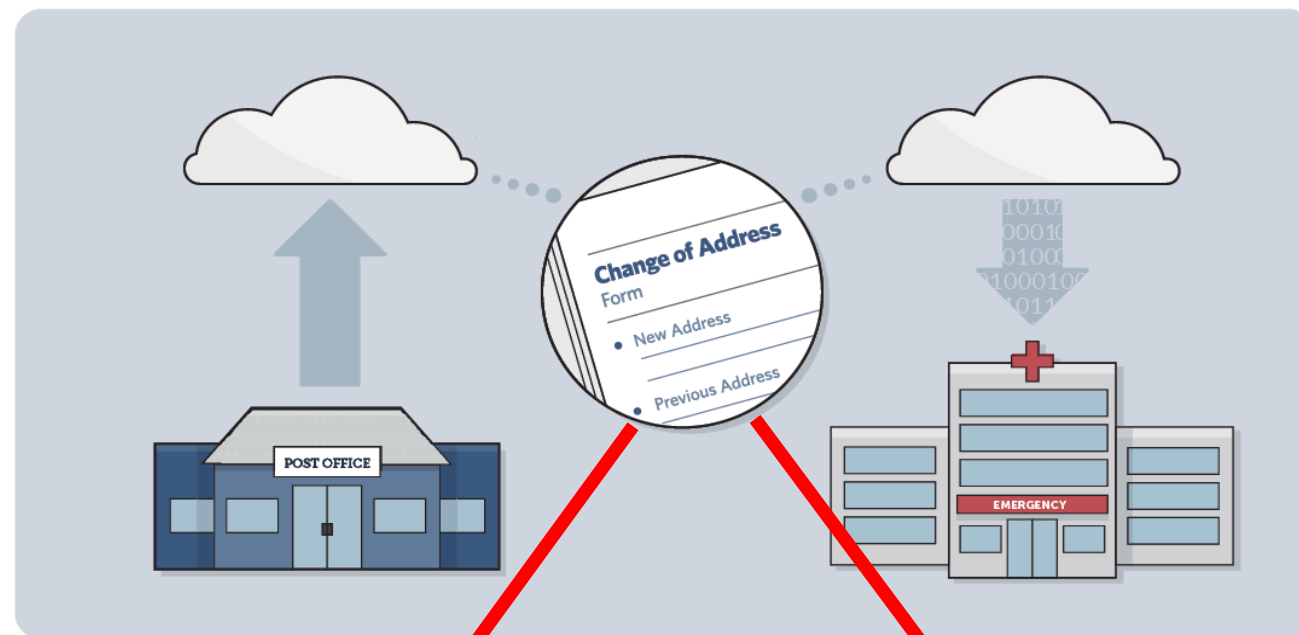
- There is no universal patient identifier
- From VT HIE Strategic Plan: Create One Health Record for Every Person
- VHIE receives records from numerous HCOs, with different identifiers... how to accomplish this goal?  
Answer: The MPI.
- Use data and algorithms to determine if records “match”, and link them if they do
- VITL’s MPI, Verato, chosen #1 of 20 rated by leading health IT market survey firm
- Improvement of duplicates and specified population match rate from <65% to >95%





# Referential Matching

- Collect data from outside healthcare and use to assist in matching patients
- Significant improvement in match rates
- VITL's MPI does this



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**Yes!**

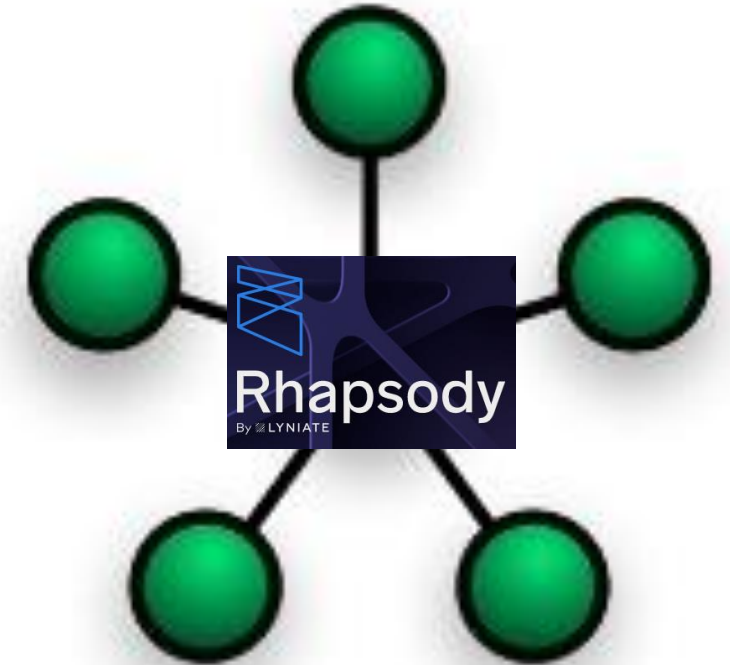
**Match?**

Porter Med Ctr.  
Name: Susan Meier  
MRN: 6789  
Address: 123 Main St  
Middlebury, VT

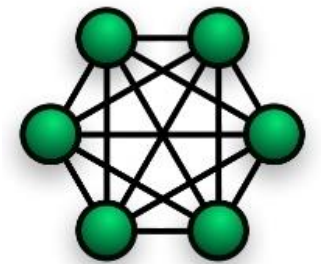
Copley Hospital  
Name: Susan Meier  
MRN: 1234  
Address: 454 Pine St  
Johnson, VT

# Interface Engine – what does it do?

- It is the “traffic cop” for data exchange – a central hub that the information flows through
  - Flexible communication
    - Files
    - Real-time messages
    - Scheduled tasks
    - Hub and spoke routing
  - Guaranteed delivery, in proper order
    - Resilient to system outages, etc.
  - Flexible message processing
    - Translate and transform message data
  - Built in knowledge of health care data
    - Facilitates interface development

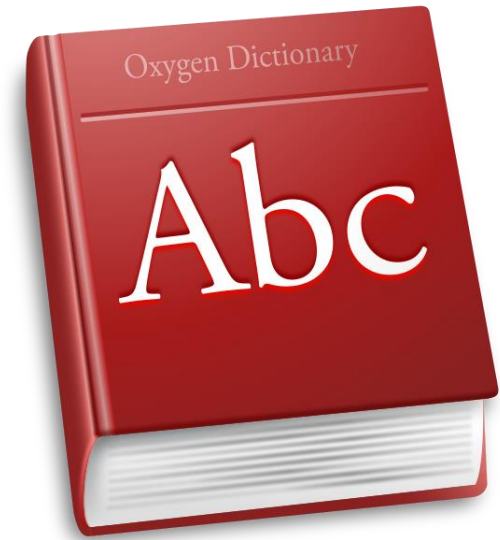


Not this!



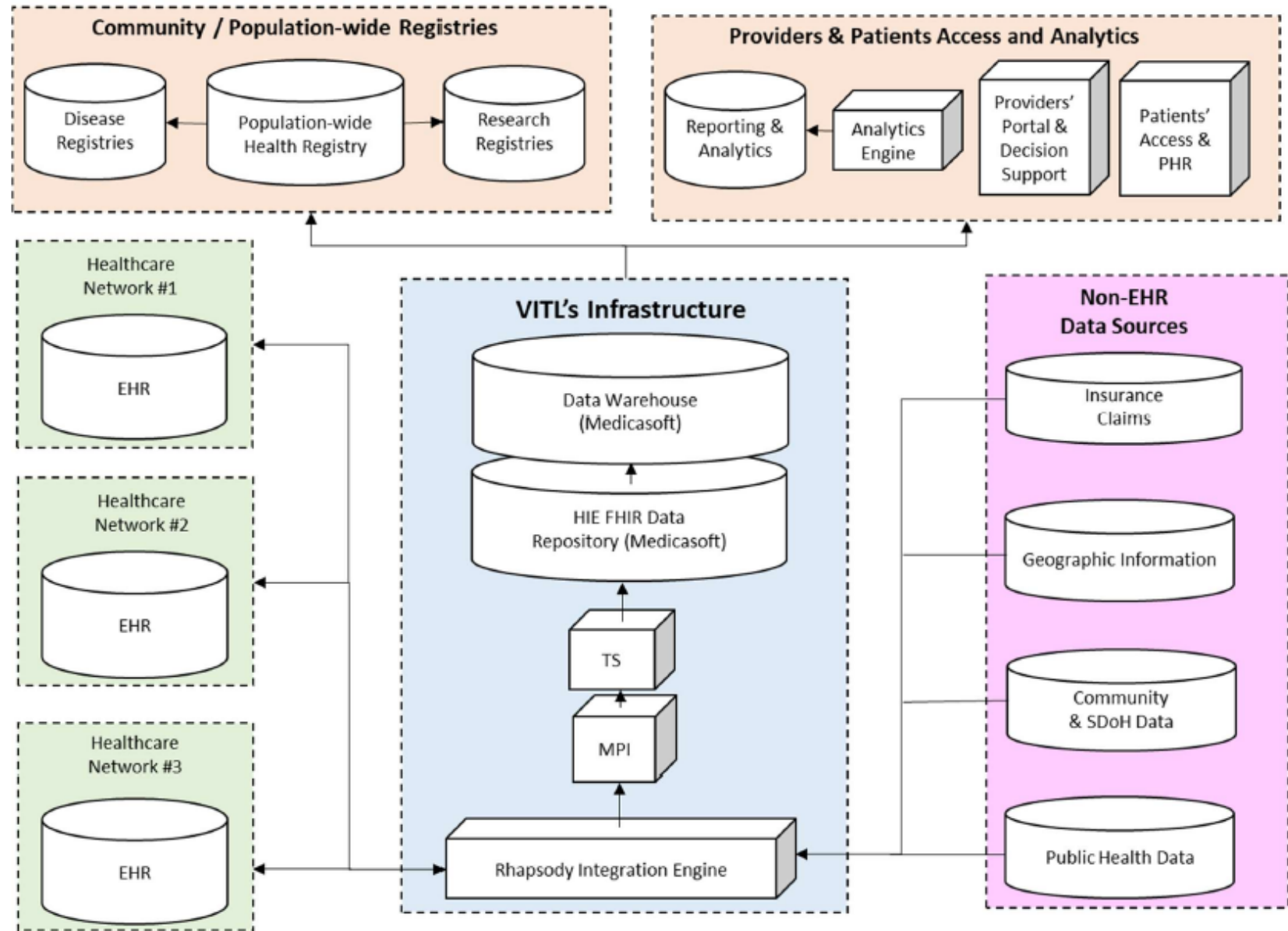
# Terminology Services

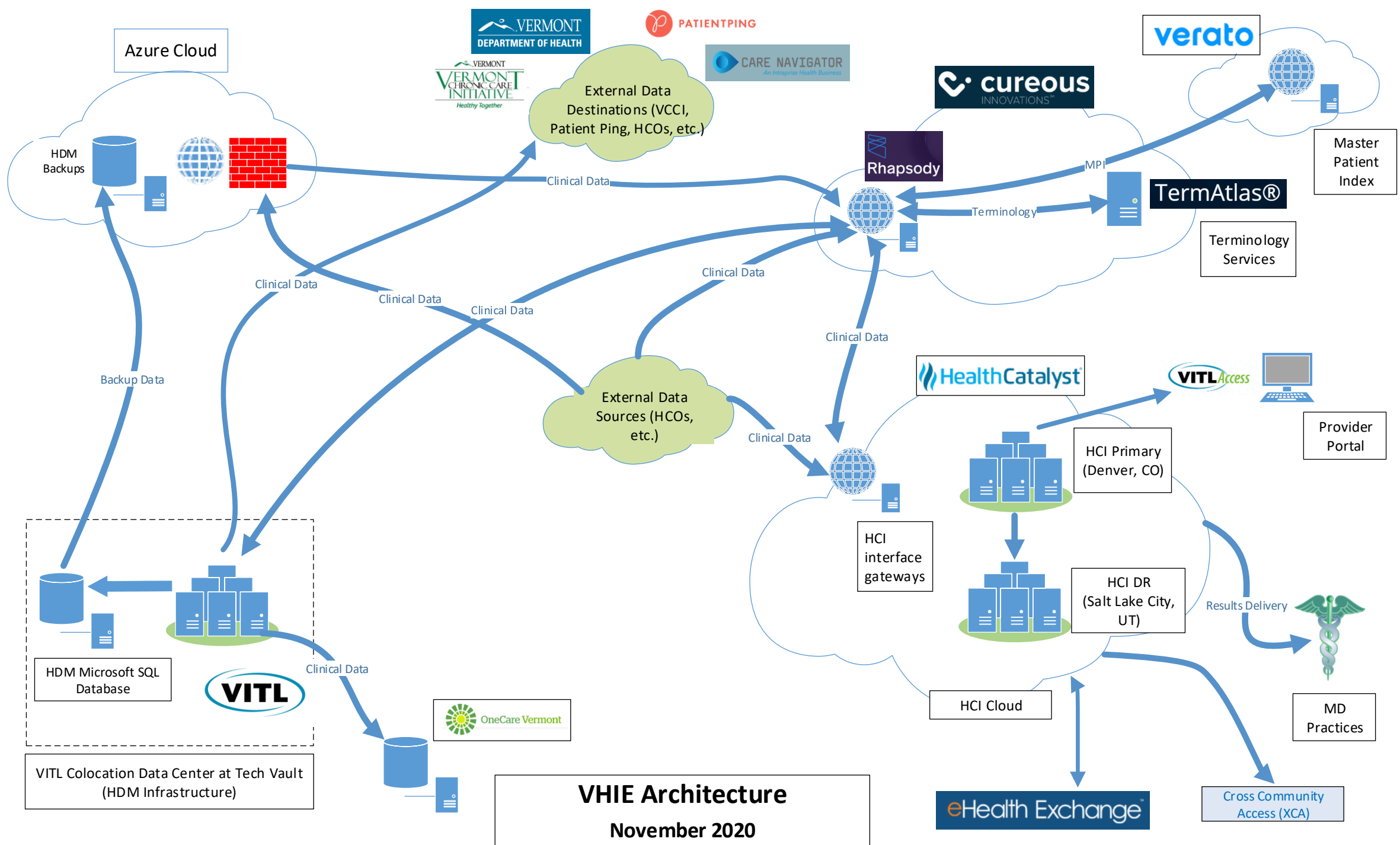
- Analytic applications must have standardized terminology
  - Critical to use the same term for the same concept
- But healthcare data uses multiple coding systems
  - “The great thing about standards is that there are so many to choose from” 😊
  - Some terms aren’t even standardized (“local codes”)
- This is a data quality issue
  - Consider: centralized vs. distributed “fixes” for data quality
  - Both have a role – Terminology Services are a centralized fix.
- Terminology services allow us to map (translate) and manage the various terms
  - This is hard, detailed work. Requires domain knowledge and careful validation



# Architecture

- Modularity is key
  - Balance “best of breed” vs. integrated approach
  - Can change components over time
  - CMS emphasis on this
- The components need to be “in the right place”
  - Identity, and terminology, should not require processing by our repository platform
  - This has been a limitation of our previous architecture. Collaborative Services has changed this

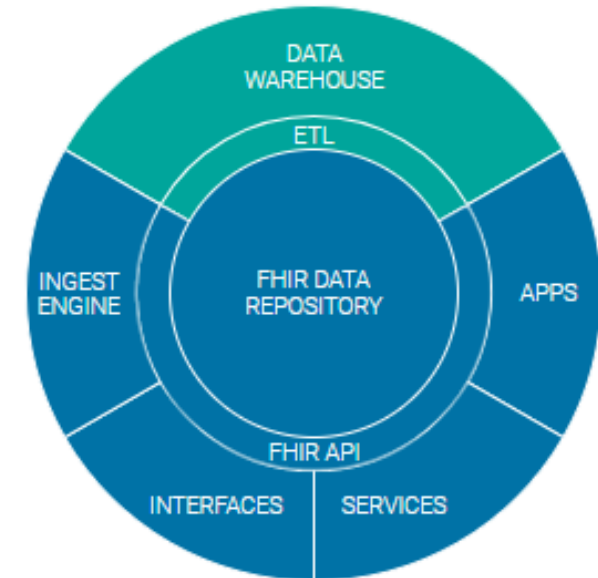




**VHIE Architecture**  
November 2020

# Collaborative Services second phase underway

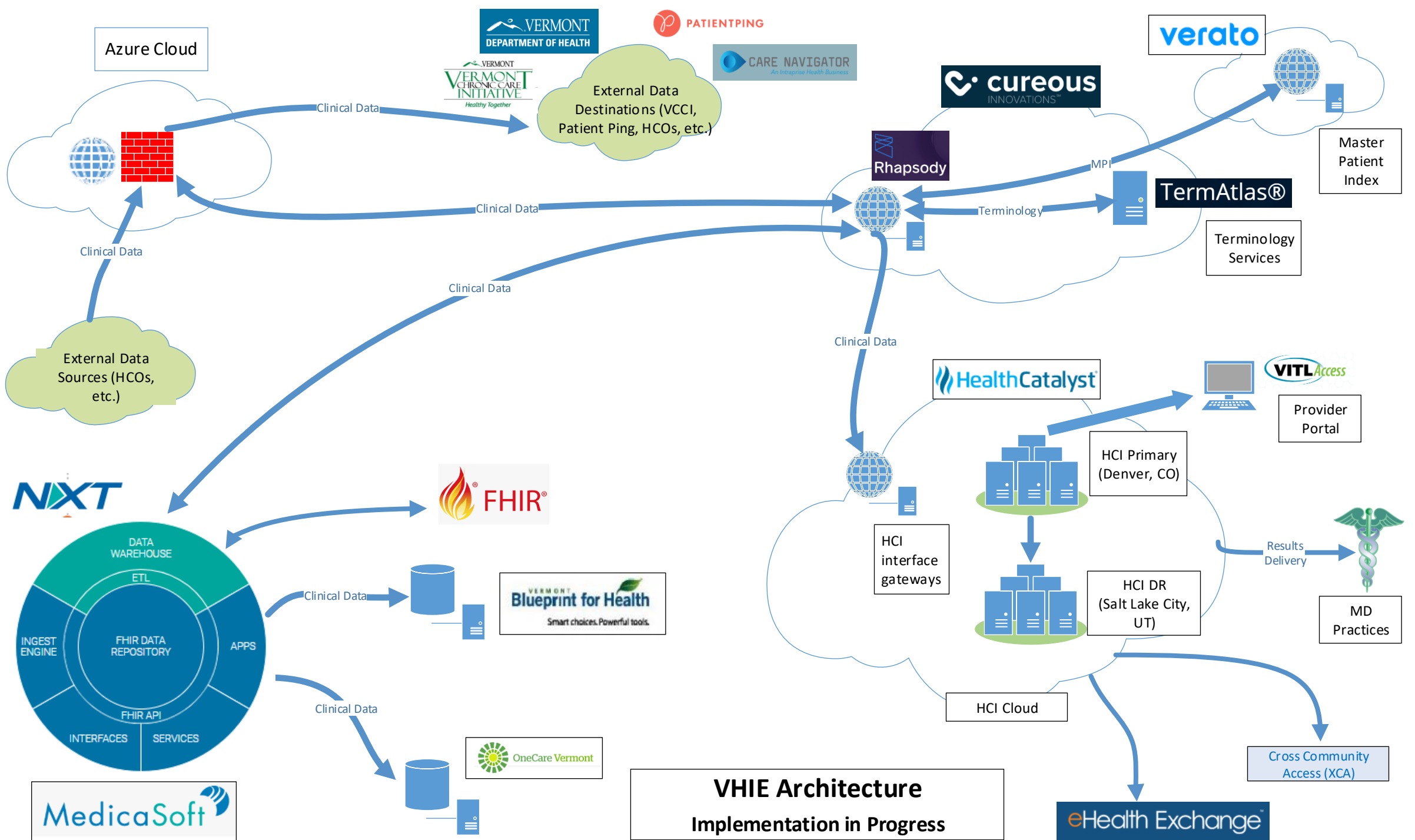
- Implementation of the MedicaSoft NXT platform
- Native FHIR repository with full support for FHIR APIs
- Currently working on the complex transformation of clinical data to FHIR:
  - HCOs currently use earlier data standards
  - MedicaSoft platform transforms data to FHIR
  - Interoperability solution would leverage this work
- Once established, scope of data will be expanded:
  - Claims
  - SDOH
  - Sensitive data
- The Collaborative Services Subcommittee is providing guidance to this effort



# Our Goals for the MedicaSoft Platform

- Consolidate and streamline fragmented data platforms
- Establish a robust repository of clinical data to support multiple organizations' reporting needs to advance the health care system
- Implement FHIR capability
- Expand data scope
- Shed current owned and self-developed infrastructure







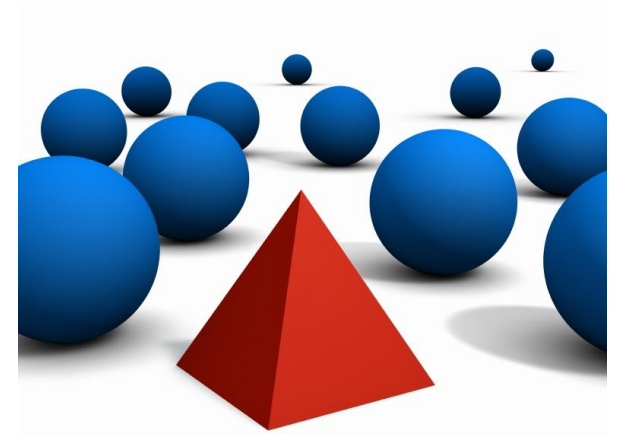
# What is HL7 FHIR?

- HL7 FHIR is an emerging standard for health care data exchange – began in 2011, now in its fourth version
- HL7 (Health Level 7) is one of the most prominent health care data standards organizations
- HL7 version 2 and 3 form the basis for interfaces in the VHIE today
- FHIR (“Fire”) stands for **Fast Healthcare Interoperability Resources**

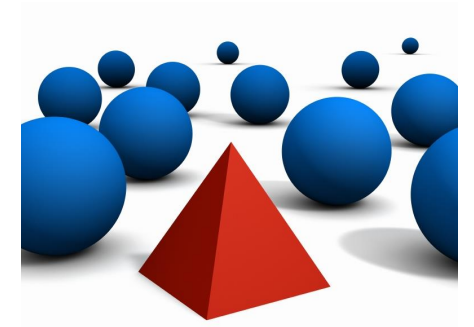


# What is different with FHIR?

- Faster interface development
- Predefined “resources” and interactions
- Majority of common use cases are predefined
- Less negotiation and customization to implement
- Uses mainstream Web technologies
- Designed for all platforms: browsers, mobile, devices, etc.
- We expect FHIR to become the primary data interchange standard we will be using
  - Both the ONC and CMS have created regulations that will require support for FHIR



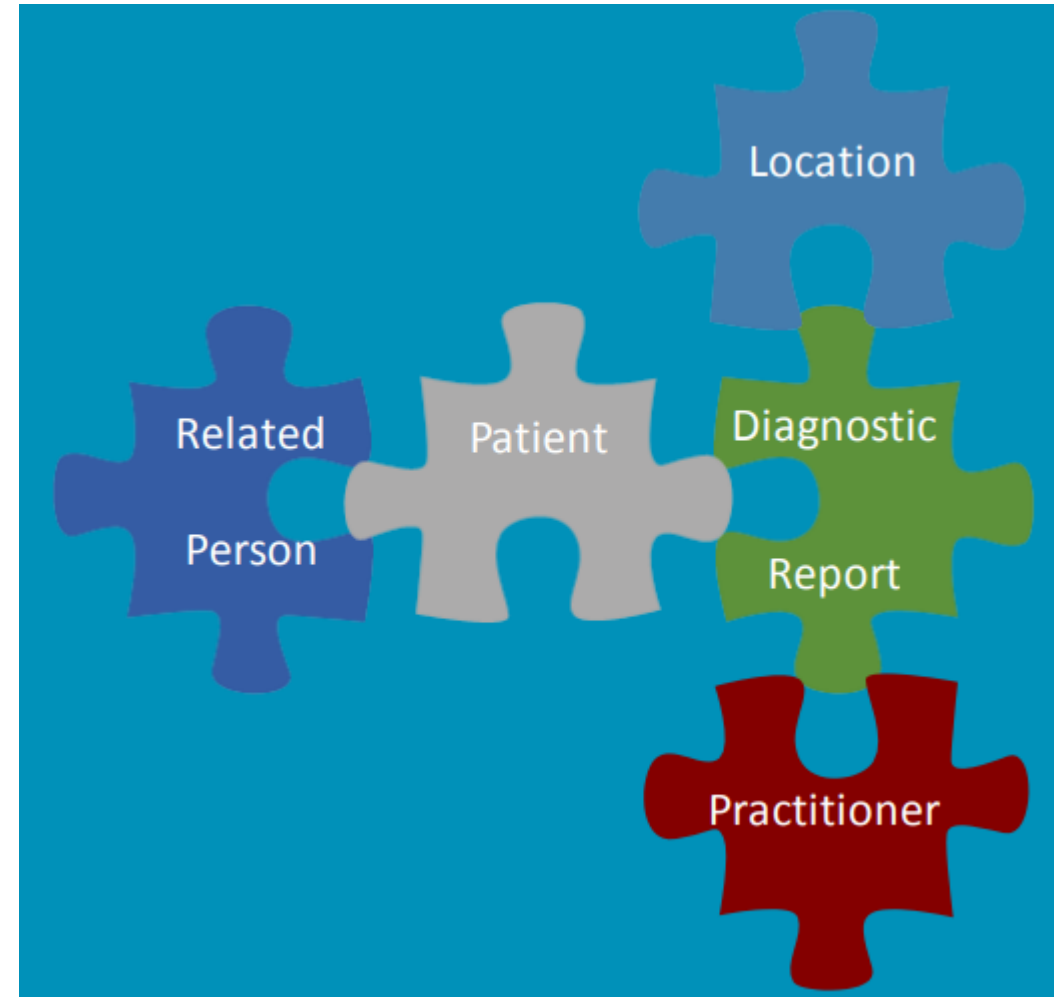
# Other Differences



- HL7 v2 and v3 are **primarily** *push* technologies
  - Systems *push* data out to other systems when it changes
  - This interaction is defined and implemented in advance
- FHIR is **based on a request model** (client-server)
  - Systems retrieve data from other systems when needed, or request to post data
  - Application Program Interfaces (APIs) are used to pull the data
- Data often stays in the system that is the source of truth
  - Solves many problems with data getting out of sync
- FHIR servers publish a *capability statement*
  - This provides a method for systems to know what services are offered without establishing a convention in advance
- Extensions to the standard include references that explain them
  - HL7 v2 extensions are based on a separate convention that you must somehow know in advance
- FHIR's foundation is around useful objects called "resources" that can be combined in various ways

# How FHIR structures data

- FHIR structures data in *resources*. Examples:
  - **Individuals:** patient, practitioner, related person
  - **Workflow:** task, appointment, schedule
  - **Management:** encounter, episode of care
  - **Medications:** medication request, medication dispense
  - **Diagnostics:** observation, diagnostic report, specimen
  - **Entities:** Organization, Health Care Service, Location
- Resources have defined behavior and meaning
- Resources are the smallest unit of data exchange
- Resources can be combined into *bundles*
- Resources are communicated through Application Program Interfaces (APIs)



# Here's what a FHIR resource looks like (JSON)

```
{
  "resourceType": "Patient",
  "id": "example",
  "meta": {
    "versionId": "1",
    "lastUpdated": "2017-01-03T16:05:00.792Z"
  },
  "text": {
    "status": "generated",
    "div": "<div xmlns=\\"http://www.w3.org/1999/xhtml\\"><p>Henry Levin the 7th</p></div>"
  },
  "extension": [
    {
      "url": "http://hl7.org/fhir/StructureDefinition/us-core-birthsex",
      "valueCode": "M"
    }
  ],
  "identifier": [
    {
      "use": "usual",
      "system": "urn:oid:1.2.36.146.595.217.0.1",
      "value": "12345"
    }
  ],
  "active": true,
  "name": [
    {
      "use": "official",
      "family": "Levin",
      "given": [ "Henry" ],
      "suffix": [ "the 7th" ]
    }
  ],
  "gender": "male",
  "birthDate": "1974-12-25",
  "managingOrganization": {
    "reference": "Organization/example"
  }
}
```

FHIR id & metadata

Human Readable Summary

Extension with reference to its definition

Standard Data Content:

- Patient Identity
- Name
- Gender
- Date of Birth
- Provider

# VHIE Roadmap

January 4, 2021

# CY21 DVHA Contract: Development

- Collaborative Services: MedicaSoft Platform Implementation
  - Blueprint extracts (VCR decommissioned)
  - Transition of interfaces, plan for FHIR interfaces
  - Interoperability/ Information Blocking
  - New data types
    - Ingest Medicaid **Claims**
    - Develop requirements for **Substance Use and Sensitive Data**
    - Develop requirements for **Social Determinants of Health** and support OneCare project
  - Document policies and procedures

# CY21 DVHA Contract: Development

- Public Health/ COVID response
  - Connections to new labs and immunization sites
- Expanding data collection and data access
- New provider portal
- Explore event notification
- Meaningful Use and Security Risk Assessment Consulting
- Emergency response
- Data Quality – transition to Bi-State partnership
- HEDIS gap analysis
- Data Governance



# CY21 DVHA Contract: Maintenance & Operations

- Monthly reporting to DVHA
- Infrastructure maintenance (CDR, MPI, Terminology Services)
- Interface maintenance
- Consent education
- VHIE Security
- Technical Support

# CY21: VITL Projects

## Internal

- Stakeholder engagement
- Outreach / story-telling
- Customer service
- Training on new platform
- Business model

## Client-facing

- OCV data reporting
- Incident response
- Interoperability – ADT notification for hospitals

# Future Opportunities

Future opportunities to be defined and validated through ***robust stakeholder engagement.***

- Adding value at the Point of Care
- Expanding depth and types of data, enhance existing relationships and create new opportunities
- Consulting