



## NORTH CAROLINA HEALTH INFORMATION EXCHANGE AUTHORITY

December 9, 2025  
Advisory Board Meeting

# Welcome & Call to Order

# North Carolina Health Information Exchange Authority



- **Operations Update**
- **Rural Health Transformation**
- **HR1**
- **Overview of the NC HealthConnex System**
- **NC HealthConnex's Identity Resolution Process**
- **Analytics and External Services Showcase**



# Operations Updates:

1. Staffing
2. Metrics
3. Budget & Contracts
4. Privacy & Security



# Staffing

# Roadmap 2030 Workshop



- **36** HIEA and SAS Staff
- **18** successes appreciated
- **18** barriers identified
- **25** opportunities assessed



# Metrics

# Goal 1: Broaden Exchange Capabilities to Support Equitable, Whole-Person Care

**Objective 5:** Incorporate New Data Sources and Types

**Strategy 5:** Enhance NC HealthConnex's event notification service, NC\*Notify, with an **updated platform, improved user experience** and new alert offerings to include additional data sources and types.

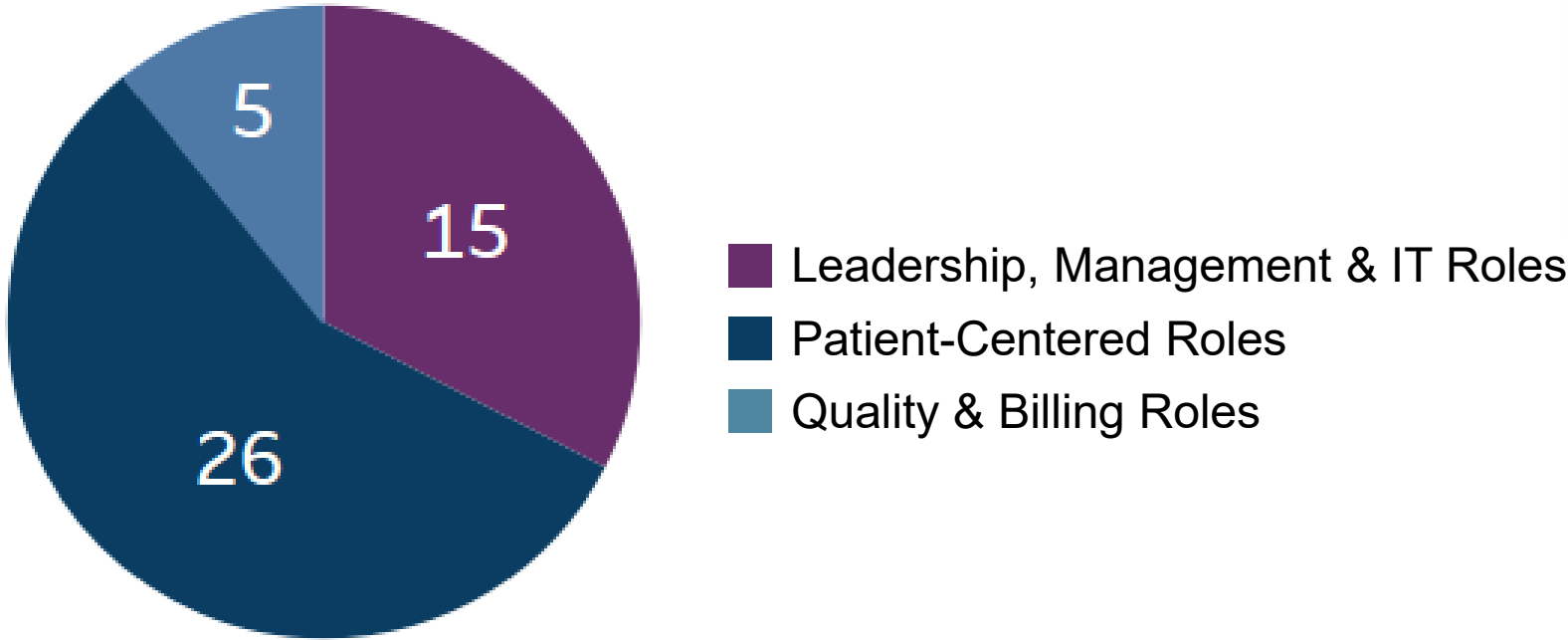
## NC\*Notify User Survey



- 8 weeks
- 22% response rate

- 5 participants identified from survey

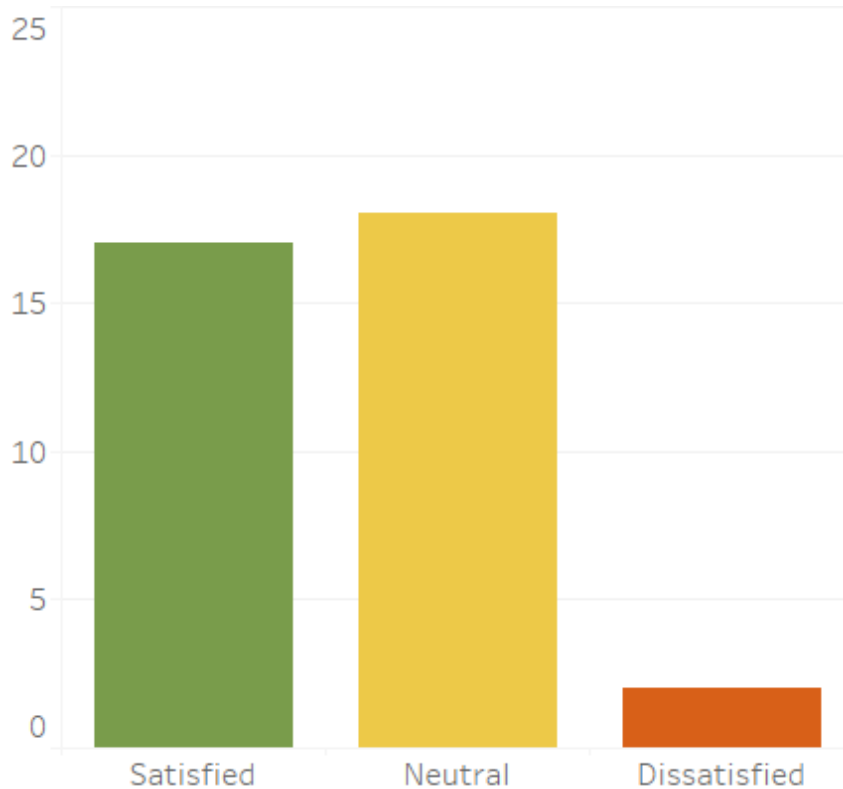
# NC\*Notify User Survey: Respondents



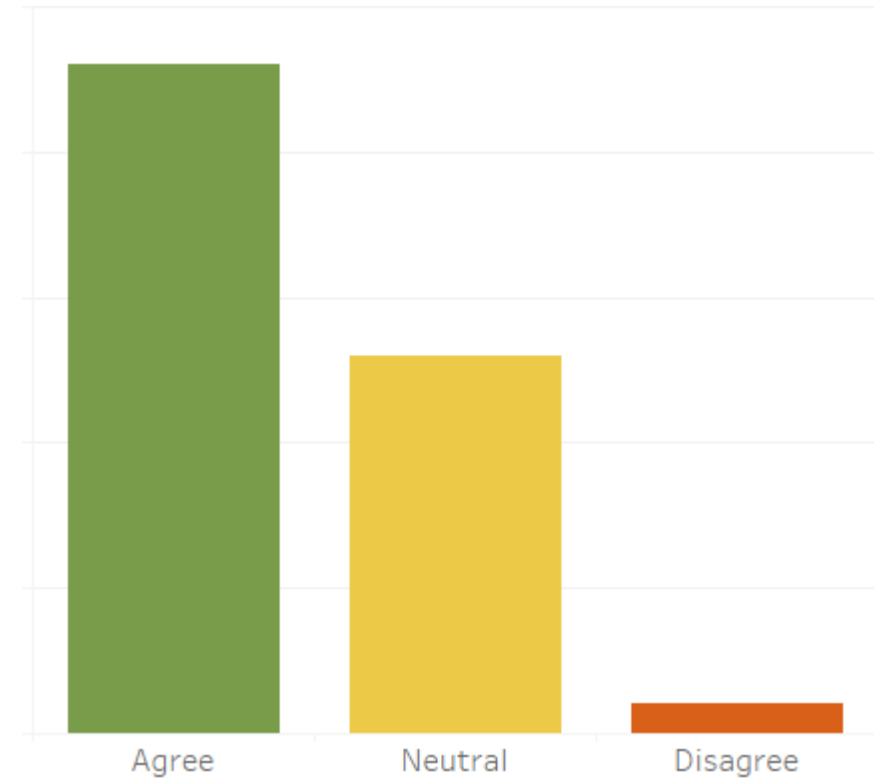
Primary Care	9
Federally Qualified Health Center (FQHC) or Community Health Center	2
Health Care System	2
Behavioral Health	1
Local Management Entities-Managed Care Organization	1
Public Health	1

# NC\*Notify User Survey: Results

**How satisfied are you with your overall experience using NC\*Notify?**

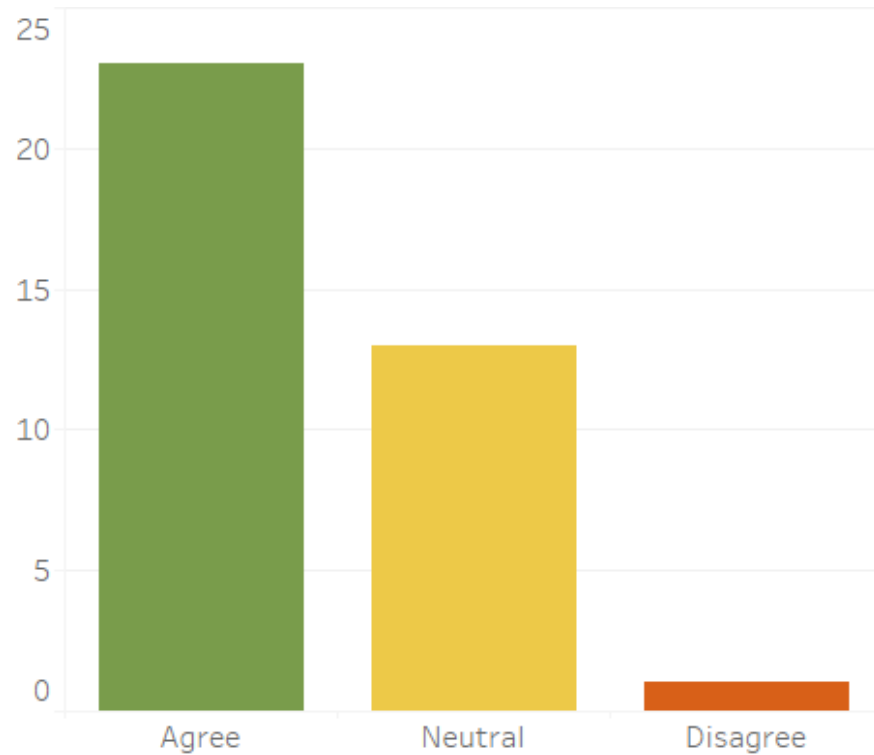


**NC\*Notify has helped improve patient care in my organization.**

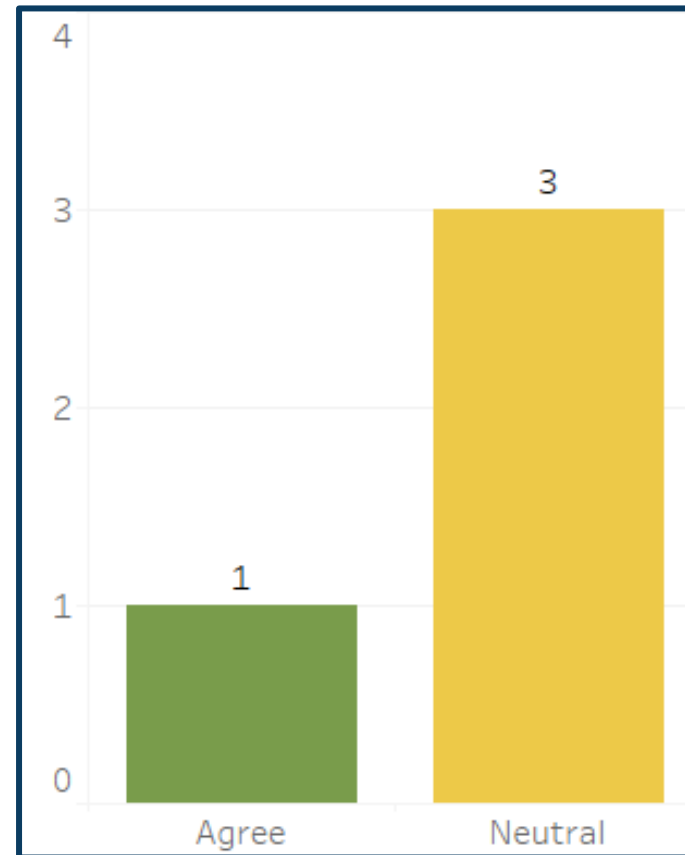


# NC\*Notify User Survey: Results

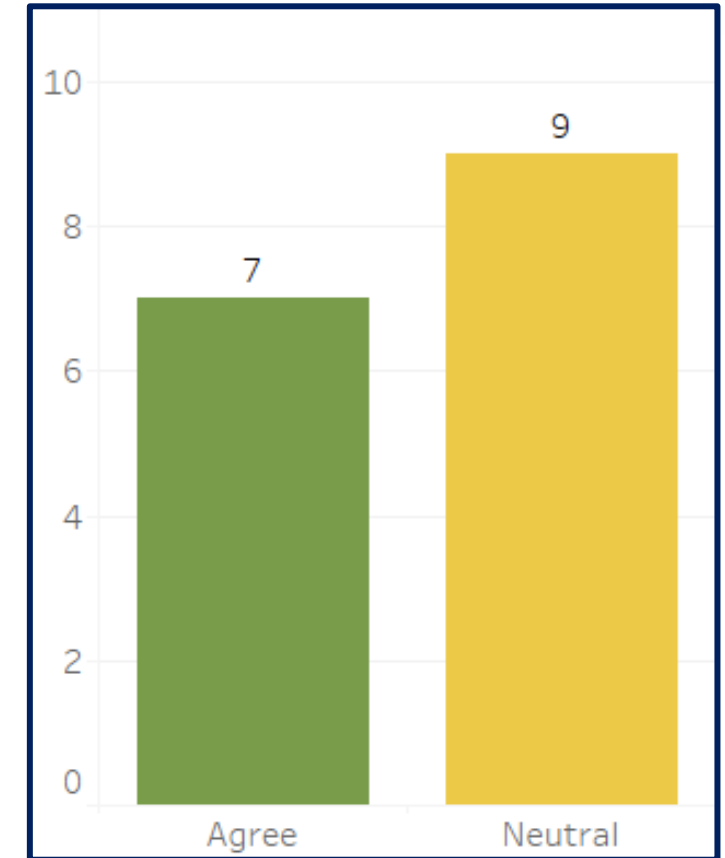
**NC\*Notify has helped improve patient care in my organization.**



**Behavioral Health Providers**



**Independent + Small Providers**



# NC\*Notify User Survey: User Feedback

**Tell us about any challenges that you may experience while using the NC\*Notify services.**

- Notification Management
- Login and Access Issues
- Navigation Usability

*"It would be nice if there was a way to not automatically send patients who only had 1 visit to us. We receive so much for patients that no longer come to us."*

**How can we improve the NC\*Notify services?**

- Data Timeliness
- Document Quality

*"Offer weekly and month summary report of ED visits and hospitalizations for populations and [integrate a] filter [to save]."*



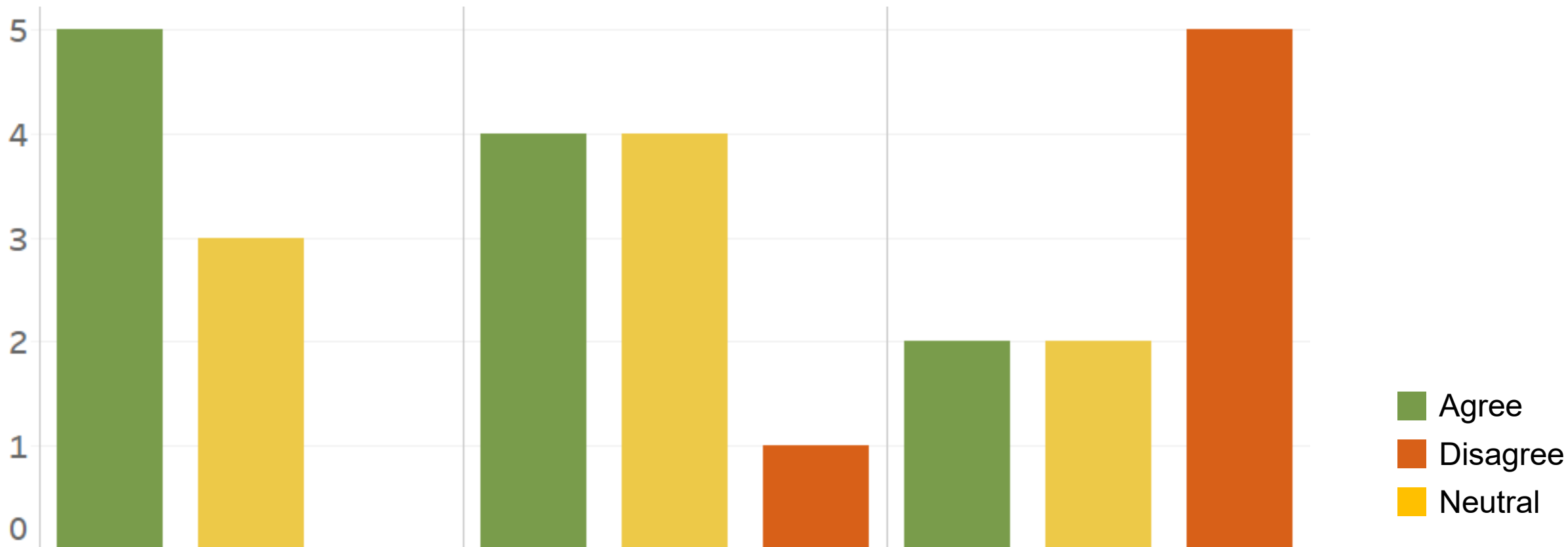
# NC\*Notify User Survey: Plus-Tier



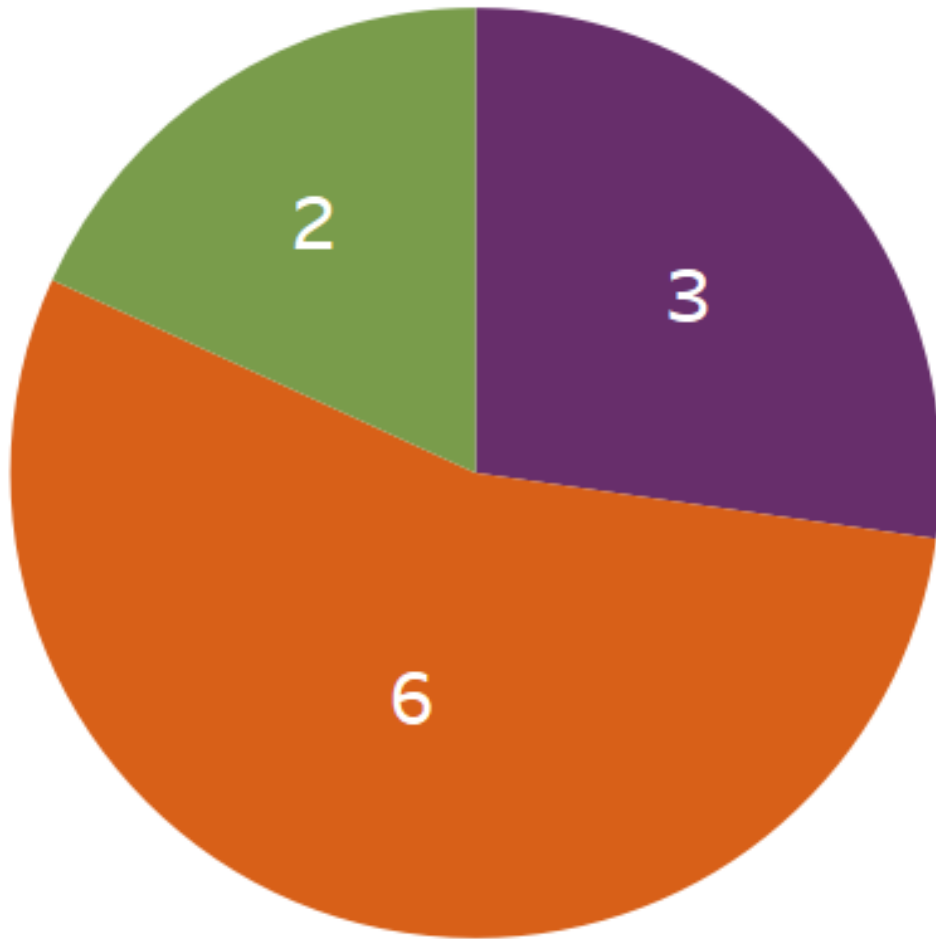
The NC\*Notify Dashboard helps me quickly identify patients who need follow-up care.

The workflow buttons and tabs (Not Started, In Progress and Complete) feature help me organize, track and/or follow-up on NC\*Notify notifications.

The filtering feature helps me search for and find the notifications that are most meaningful to me.



# NC\*Notify User Survey: Advanced Alerts



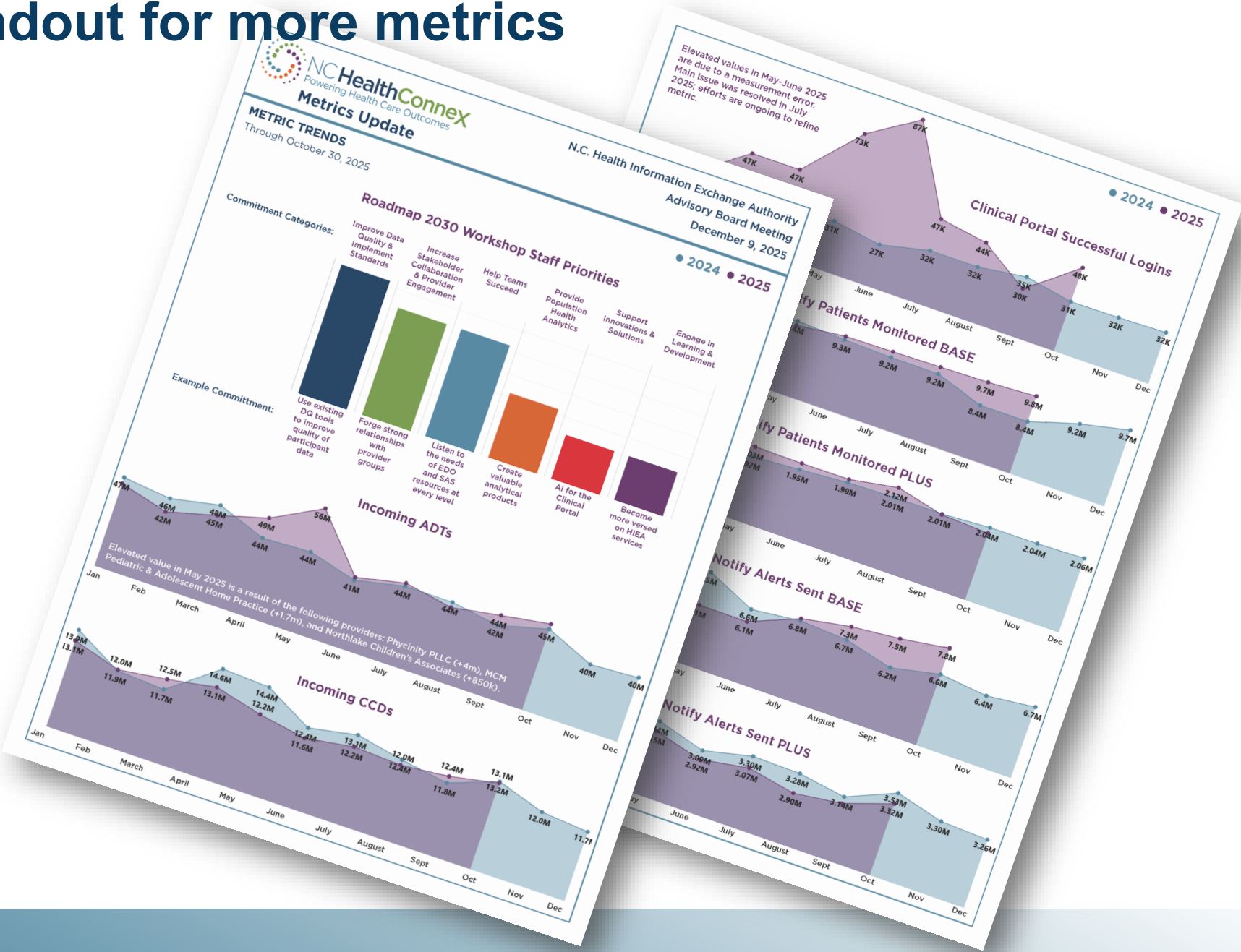
- We are aware of this feature, but do not use it.
- We were not aware of this feature.
- Yes, we use them.

**NC\*Notify Advanced Alerts** are near real-time notifications that include specialized updates.

We currently offer five advanced alerts that help providers respond quickly and coordinate care more effectively:

- High Utilizer Alert
- Dental Alerts
- Care Team Change Alert
- Diabetes Diagnosis Alert
- Chronic Care Management Alert

# See handout for more metrics



# Budget & Contracts

# Neimand Collaborative

- March 2025 – Submitted Requisition for Neimand Collaborative to be our public relations vendor.
- May 2025 – Submitted Exception Form to allow us to choose Neimand as our vendor without soliciting additional bids due to their existing relationship and overlap of work with NCDHHS.
- June 2025 – Neimand submitted initial proposal to NC HIEA, outlining four phases of work including:
  - **Discovery & Research** – identifying healthcare providers current awareness of our brand and services
  - **Message & Strategy Development** – creating a message framework, best strategies, tactics and message channels based on the research
  - **Digital Marketing & Stakeholder Engagement** – a multi-channel strategy that integrates paid and digital media
  - **Monitoring & Continuous Improvement** – tracking campaign performance in real-time and performing post-campaign evaluations
- October 2025 – Revised proposal for work to be spread over two fiscal years
- November 2025 – Executed contract
- January 2026 – Work kicks off

# Privacy & Security

# 2025 Annual Risk Assessment

1. All risk assessment reports have been finalized and approved by NC HIEA, NCDIT and SAS.
2. A draft of the Corrective Action Plan (CAP) will be delivered to stakeholders by December 19, 2025.
  - a) Formalize Privacy Program Management (PM, PL, PT, SR).
  - b) Scope and budget disaster recovery (CP).
  - c) Address discrete gaps across 7 control families.
3. In January 2026:
  - a) Begin reviewing the draft CAP and RACI, prioritizing, budgeting, and planning implementation in more detail.
  - b) Begin creating a Privacy Program.





# Rural Health Transformation



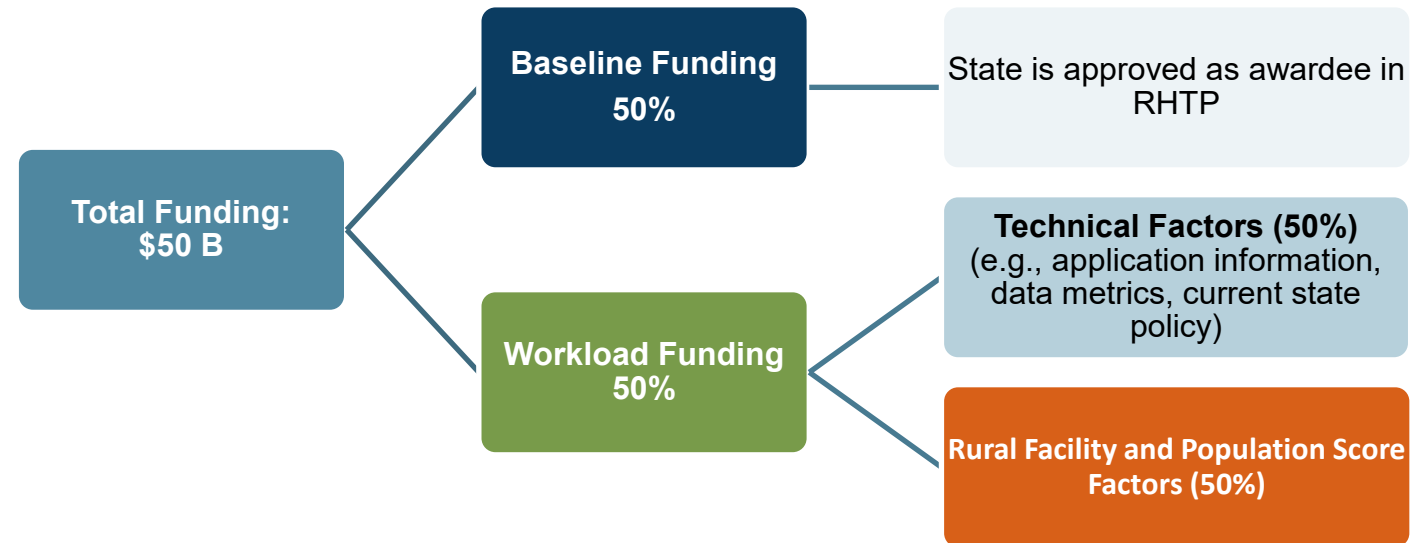
# Centers for Medicare and Medicaid (CMS) Rural Health Transformation (RHT)

## Overview

**Authorized under HR1, the RHT provides \$50 billion to states to strengthen health care delivery systems in rural communities and improve health outcomes of rural populations.**

### Overview

- H.R.1 provides a \$50 billion fund for states with an approved RHT program application (see funding diagram below).
- Only states could apply for awards but were encouraged to engage public or private partners in application development.
- Applications were due to CMS by November 5, 2025.
- CMS must approve or deny applications by December 31, 2025.



# CMS' RHT Program Strategic Goals

**CMS is seeking to advance five strategic goals through the RHT program:**

Strategic Goal	Description
<b>Make Rural America Healthy Again</b>	<ul style="list-style-type: none"><li>• Support rural health innovations and new access points to promote preventative health and address root causes of diseases.</li><li>• Projects will use evidence-based, outcomes-driven interventions to improve disease prevention, chronic disease management, behavioral health, and prenatal care.</li></ul>
<b>Sustainable Access</b>	<ul style="list-style-type: none"><li>• Help rural providers become long-term access points for care by improving efficiency and sustainability.</li><li>• With RHT Program support, rural facilities work together—or with high-quality regional systems—to share or coordinate operations, technology, primary and specialty care, and emergency services.</li></ul>
<b>Workforce Development</b>	<ul style="list-style-type: none"><li>• Attract and retain a high-skilled healthcare workforce by strengthening recruitment and retention of healthcare providers in rural communities.</li><li>• Help rural providers practice at the top of their license and develop a broader set of providers to serve a rural community's needs, such as community health workers, pharmacists, and individuals trained to help patients navigate the healthcare system.</li></ul>
<b>Innovative Care</b>	<ul style="list-style-type: none"><li>• Spark the growth of innovative care models to improve health outcomes, coordinate care, and promote flexible care arrangements.</li><li>• Develop and implement payment mechanisms incentivizing providers or Accountable Care Organizations (ACOs) to reduce health care costs, improve quality of care, and shift care to lower cost settings.</li></ul>
<b>Tech Innovation</b>	<ul style="list-style-type: none"><li>• Foster use of innovative technologies that promote efficient care delivery, data security, and access to digital health tools by rural facilities, providers, and patients.</li><li>• Projects support access to remote care, improve data sharing, strengthen cybersecurity, and invest in emerging technologies.</li></ul>

# North Carolina Department of Health and Human Services (NCDHHS)

## RHT Application Overview

- **Organization:** North Carolina's Department of Health and Human Services (NCDHHS) led the development of the state's CMS RHT response.
- NC submitted its application to CMS, "North Carolina Rural Health Transformation Program," on November 3, 2025.
- **North Carolina's RHT proposal seeks to transform rural health through six integrated initiatives:**
  1. **Community-Rooted Care Networks:** Establishing locally governed "NC ROOTS" Hubs that connect medical, behavioral health, and social services, making it easier for rural residents to access comprehensive care close to home
  2. **Prevention and Chronic Disease Management:** Expanding programs for diabetes and hypertension control, cancer screening, maternal health services, and nutrition support, including "food as medicine" initiatives
  3. **Behavioral Health Expansion:** Growing mental health and substance use disorder services through new clinics, mobile crisis teams, school-based programs, and integration with primary care
  4. **Workforce Development:** Training and retaining healthcare professionals through rural residency programs, incentives and innovative career pathways—creating jobs while addressing provider shortages
  5. **Financial Sustainability:** Helping rural practices and hospitals transition to value-based payment models that reward keeping people healthy, not just treating illness
  6. **Technology and Innovation:** Deploying cutting-edge artificial intelligence to support rural providers, expanding broadband access, improving health information sharing, and ensuring digital literacy for all residents

NC HIEA  
partnership  
proposed

# Centers for Medicare and Medicaid (CMS) Rural Health Transformation (RHT)

## NC HIEA Rural Connectivity

*Expanding rural connectivity is not merely a technical goal—it is a public health imperative.*

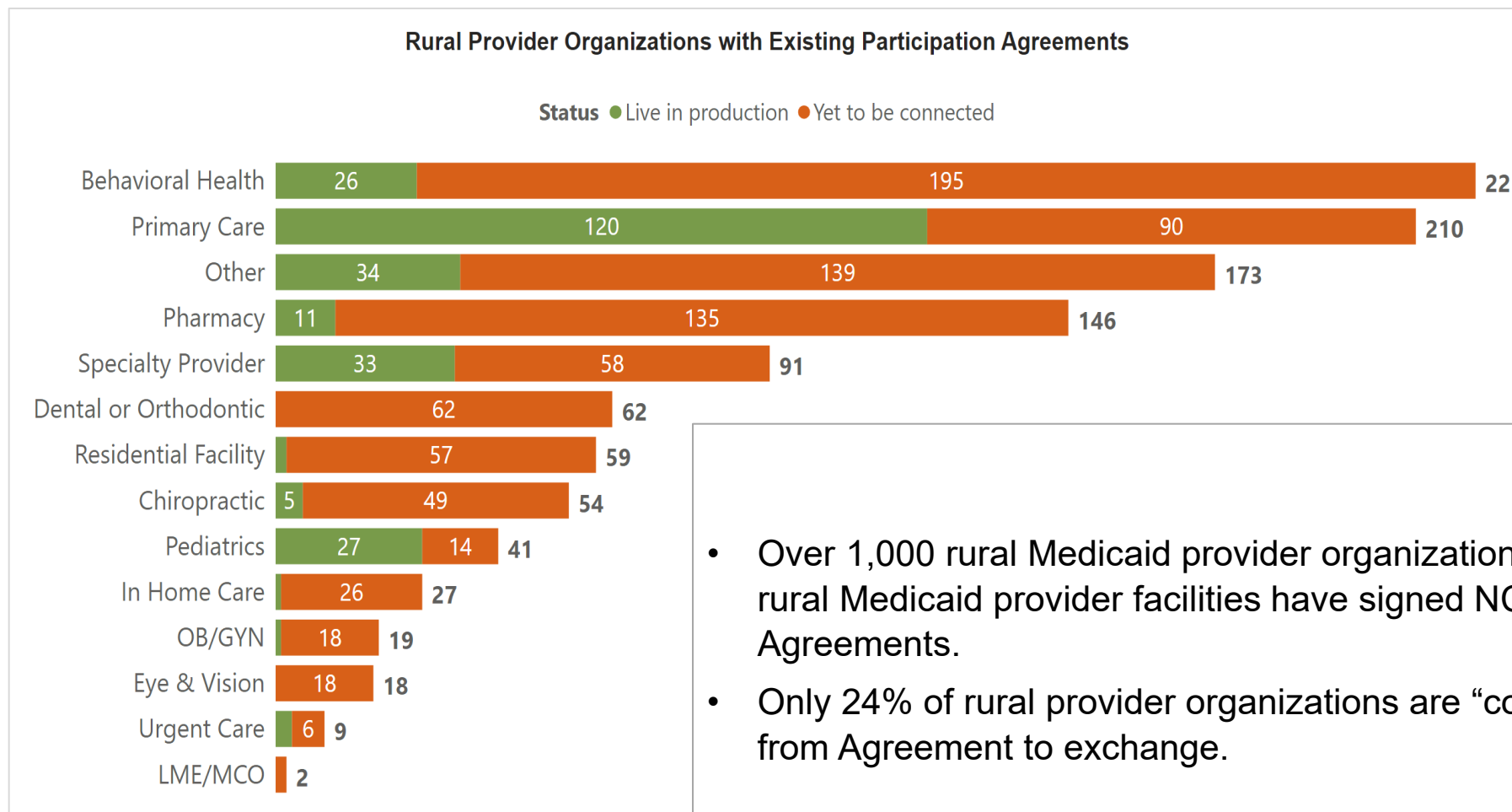


**Justin Stewart**, training officer for Rockingham County EMS, a rural emergency services provider:

*“I like information, but I know connectivity has always been a challenge for our people. The NC HealthConnex Clinical Portal is a critical software that we’re trying to spread out throughout our community of paramedics and emergency services. **It can make a life and death difference being able to have at your fingertips access to information that we never would have even been close to seeing before** like allergies, medications and urgent care visits.”*

# Centers for Medicare and Medicaid (CMS) Rural Health Transformation (RHT)

## NC HIEA Rural Connectivity



- Over 1,000 rural Medicaid provider organizations and nearly 3,000 rural Medicaid provider facilities have signed NC HIEA Participation Agreements.
- Only 24% of rural provider organizations are “connected” - moving from Agreement to exchange.

# Centers for Medicare and Medicaid (CMS) Rural Health Transformation (RHT)

## NC HIEA Application Components

**Over the next five years, NC HIEA has requested \$27.5M to advance rural health by expanding provider connectivity, delivering technical assistance, and enhancing training for rural organizations.**



**Expanding Provider Connectivity:** NC HIEA would connect over 350 rural providers across various connection types (i.e. CCD & HL7, Pharmacy, Notify) between 2026 and 2030. *(Estimated Value: \$8.3M over 5 years)*



**Delivering Technical Assistance:** To ensure successful onboarding and long-term participation of rural providers, NC HIEA would deliver targeted technical assistance to support their connection and engagement with NC HealthConnex. This assistance will include guidance throughout the connection process, support for integration with participants' electronic health records (EHRs), and coaching to improve data quality. *(Estimated Value: \$8.1M over 5 years)*



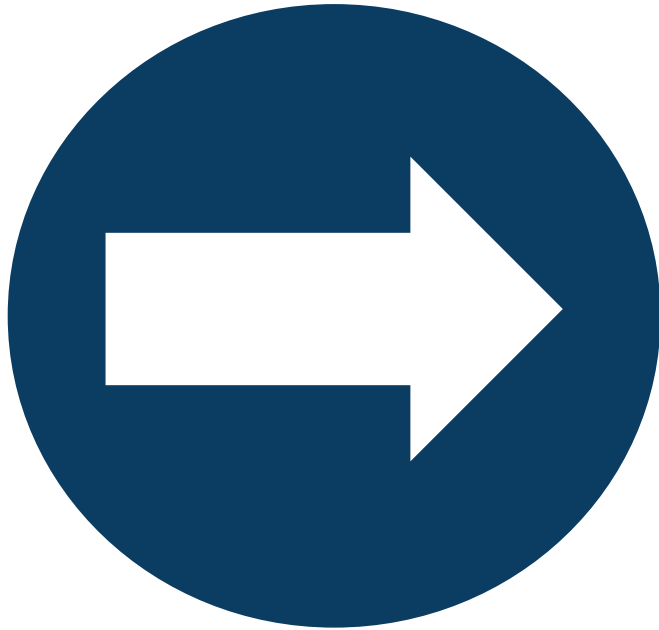
**Training:** NC HIEA will tailor its training materials to meet the needs of rural participants, including customized modules on the Clinical Portal, NC\*Notify, single sign-on (SSO), and the use of AI to provide clinicians with instant, secure patient summaries and actionable insights to support faster, data-driven care coordination and decision-making. *(Estimated Value: \$750,000 over 5 years)*



**Convening & Stakeholder Engagement:** NC HIEA will engage vendors and strategic consulting partners to ensure ongoing system maintenance and provide strategic support for effective program implementation. *(Estimated Value: \$10.4M over 5 years)*



# Next Steps



- CMS Award Decisions:
  - Expected release by December 31, 2025
- Workplan Development:
  - NC HIEA is preparing detailed workplans plans to deploy funds beginning in January 2026, if awarded
  - Workplans will incorporate timelines and compliance requirements for fund utilization

# HR1



# Summary of Need

- DHB needs to expand member evaluation to include new requirements from the HR1 (One Big Beautiful Bill Act, or OBBBA).
- DHB needs to evaluate Medicaid members twice a year against the work requirements and work requirement exceptions.
- DHB is looking to automate these evaluations where possible against existing state data repositories, including the NC HIEA.
  - The NC HIEA will offer closer to real-time data to supplement DHB's existing claims data.
- The deadline for having a final system set up is 1/1/2027, with DHB setting a deadline of 10/1/2026 for technical readiness.

# NC HIEA Activities – Determine Work Exception Criteria

There are eight health-related work exceptions that the HIEA will evaluate for DHB:

1. Pregnant or entitled to postpartum medical assistance
2. Has a substance use disorder
3. Has a disabling mental disorder
4. Has a physical, intellectual or developmental disability that significantly impairs their ability to perform 1 or more activities of daily living
5. Has a serious or complex medical condition
6. Person who is participating in a drug addiction or alcoholic treatment and rehabilitation program
7. Inpatient hospital services, nursing facility services, services in an intermediate care facility for individuals with intellectual disabilities, inpatient psychiatric hospital services, or such other services of similar acuity
8. Individual or their dependent must travel outside of their community for an extended period of time to receive medical services necessary to treat a serious or complex medical condition that is not available within their community of residence

These exceptions are broadly defined by CMS and/or NC Medicaid policy, but do not have granular criteria that can be applied to the data in NC HealthConnex. Therefore, the solution includes exploratory data analysis performed by the NC HIEA and SAS, as well as collaboration with NC Medicaid to finalize the definitions.

# NC HIEA Activities – Expose Exception Decisions to DHB

- NC Medicaid's eligibility system, NC FAST, will make an API call to the NC HIEA requesting data on a member:
  - SAS and the NC HIEA are planning to use a custom API for NC FAST.
  - NC FAST will submit individual API calls for each member being evaluated.
- The NC HIEA system will respond to the API call with a binary decision on each of the eight criteria.
  - The system will not require a backload to evaluate all HIEA patients against the eight criteria.
  - All evaluations will be completed at the time of API query.
- NC Medicaid will have the ability to retrieve details on the evidence/explanation criteria for the exceptions sent to NC FAST if/when needed.



# 10-Minute Break

# Overview of the NC HealthConnex System Architecture



# Architecture Overview

**Purpose:** Provide the Advisory Board with an overview of the technical platform that supports NC HealthConnex and highlight the features of the patient identity solution – a key component of this system.

## Topics:

- High-level Architecture and Key Components (SAS/Don)
- Sample Data Flow (Don)

# NC HealthConnex Platform Highlights

## Message & Data Volume:

- In CY 2025, 350M+ incoming messages; nearly 25M documents retrieved
- Since 2016, loaded approximately 3B lab results, 1.5B diagnosis records, 1B medications, 800M encounters

## Service Usage:

- About 40k successful logins to the Clinical Portal per month
- More than 10M patients monitored for NC\*Notify, resulting in 5M – 10M notifications delivered per month

## System Capacity

- Two Hosting Environments: Cary Data Center, Azure Cloud
- 120 Virtual Machines
- Over 1,300 CPUs
- 1 PB+ of Storage Allocated

# Key Components - InterSystems HealthShare

## **Health Connect:**

A high-performance integration engine that supports HL7, FHIR, CDA, and other standards

## **Unified Care Record:**

Aggregates data from multiple sources and formats into one comprehensive health record

## **HealthShare Patient Index (HSPI):**

Enterprise-grade Patient Identity Solution - more detail to follow later in this presentation

## **Health Insight:**

SQL-like data repository updated in near-real time; integrates well with analytics platforms like SAS



# Key Components - SAS Analytics Environment

## Use Cases

- DHHS-Facing Dashboards, e.g., Stroke Registry
- Data Assessments to Support Use Cases, e.g., Digital Quality Measures (dQMs)
- Production ETL Solutions for External Stakeholders, e.g., Priority Data Elements for NC Medicaid and health plans
- NC HIEA Self-Service Dashboarding and Ad-Hoc Analytics

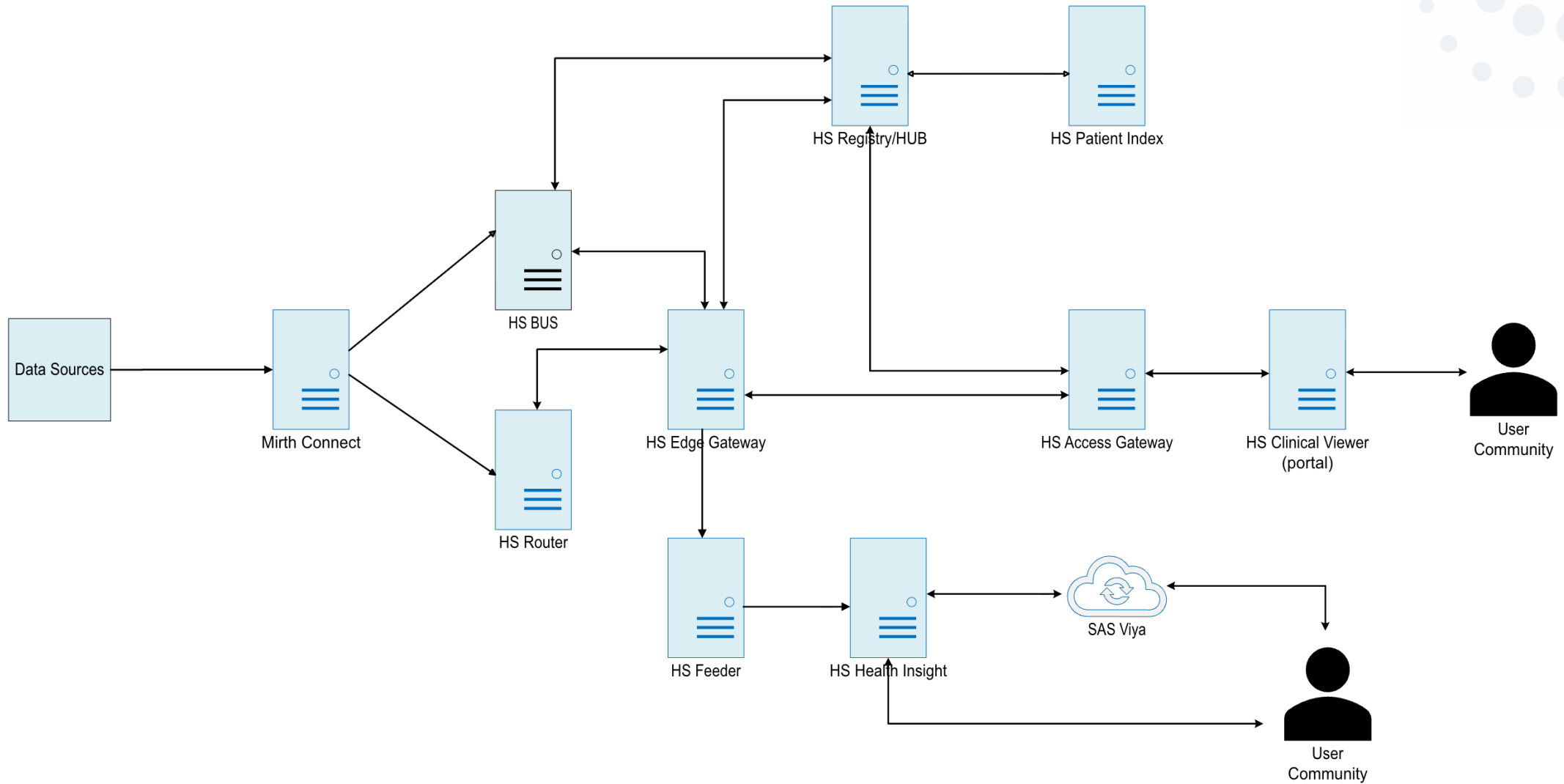
## Software and Hosting

SAS Software	Hosting Approach	Use Cases Supported
9.4	Cary Data Center	<ul style="list-style-type: none"><li>• Production ETL</li><li>• Data Assessments</li></ul>
Viya 3.5	Cary Data Center	<ul style="list-style-type: none"><li>• DHHS Facing Dashboards</li></ul>
Viya 4	Azure	<ul style="list-style-type: none"><li>• Data Assessments</li><li>• HIEA Self-Service</li></ul>

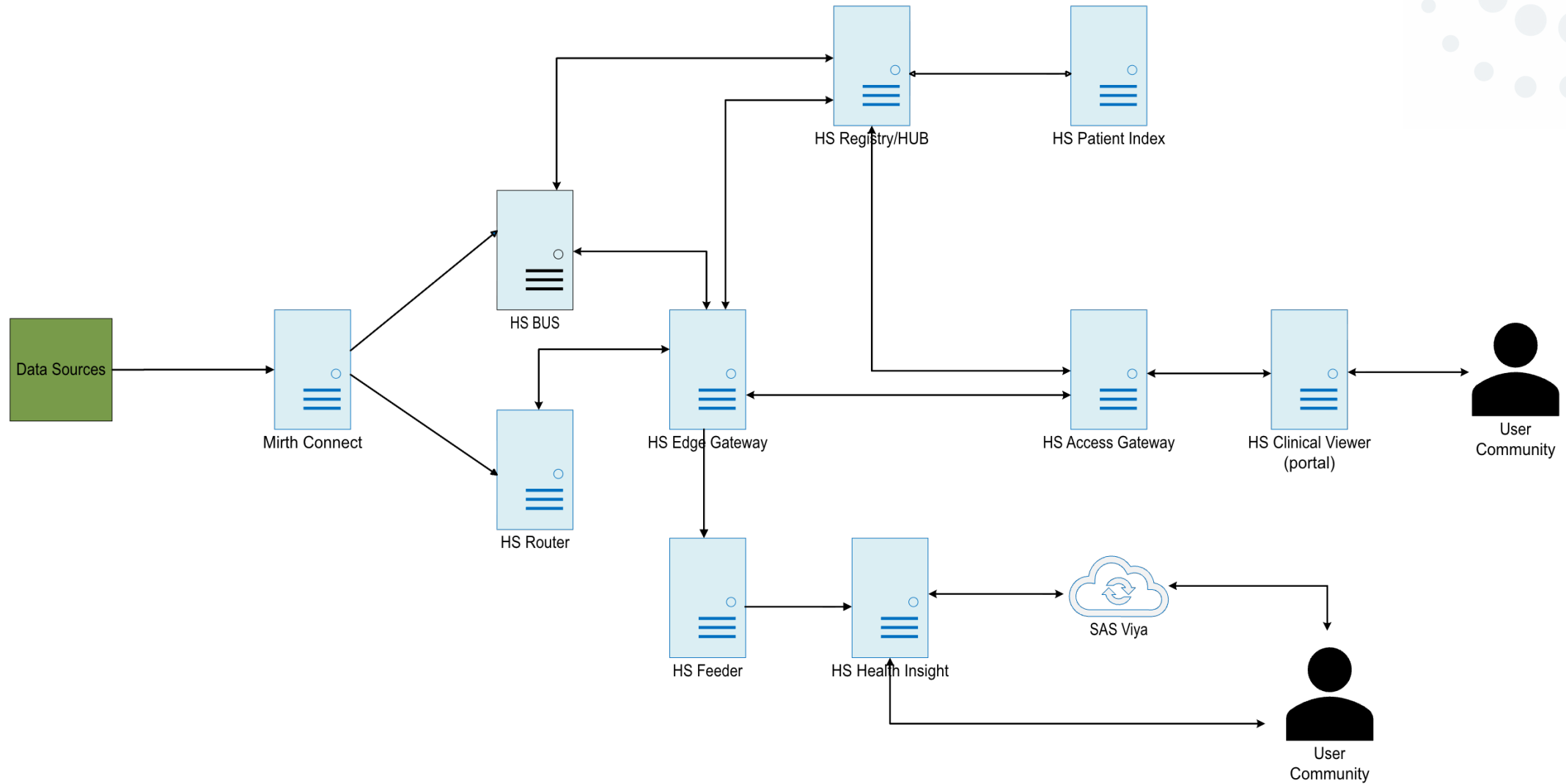
# High-Level Architecture & Data Flow



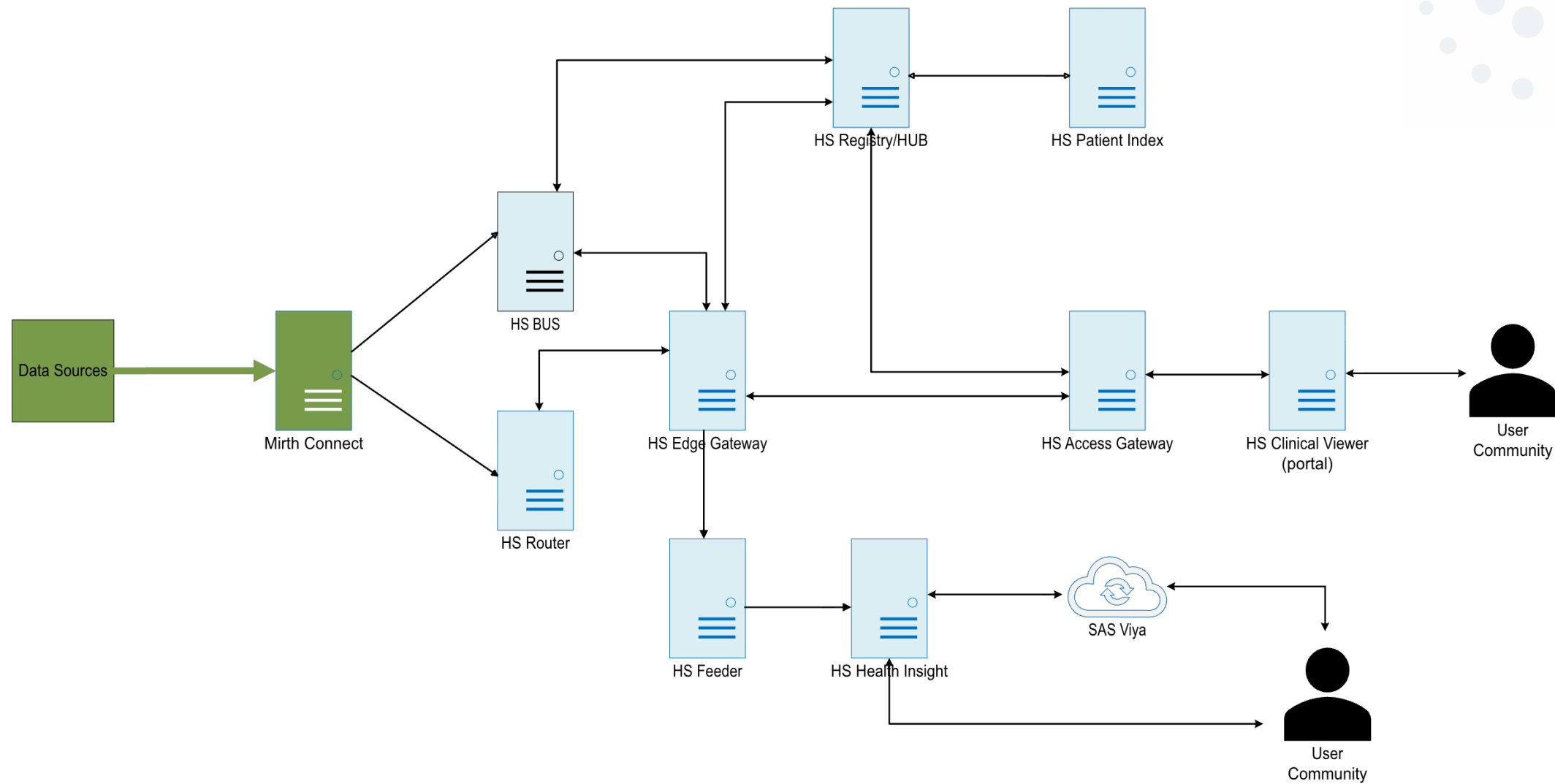
# System Architecture



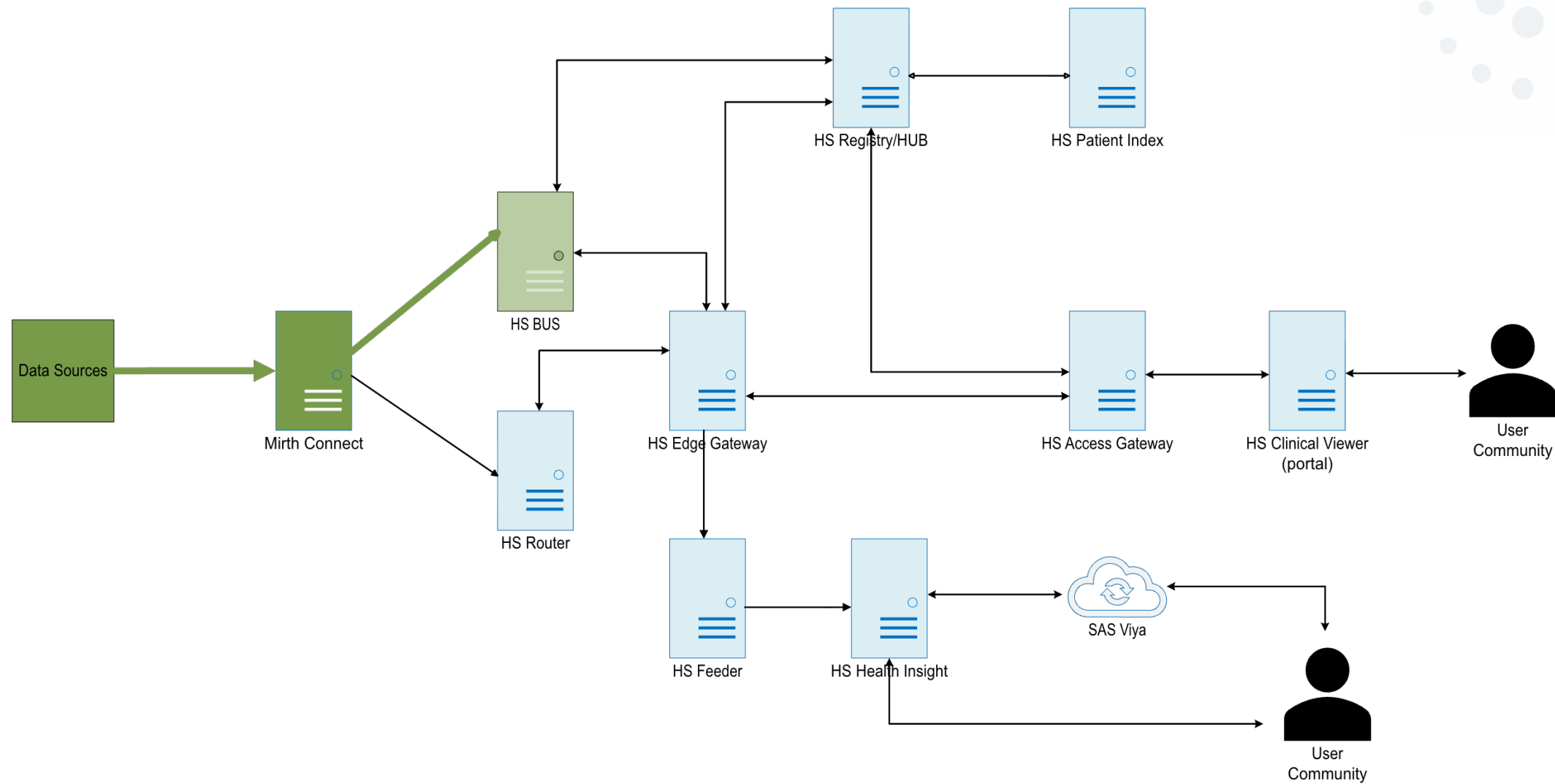
# CCD Message storage in HealthShare



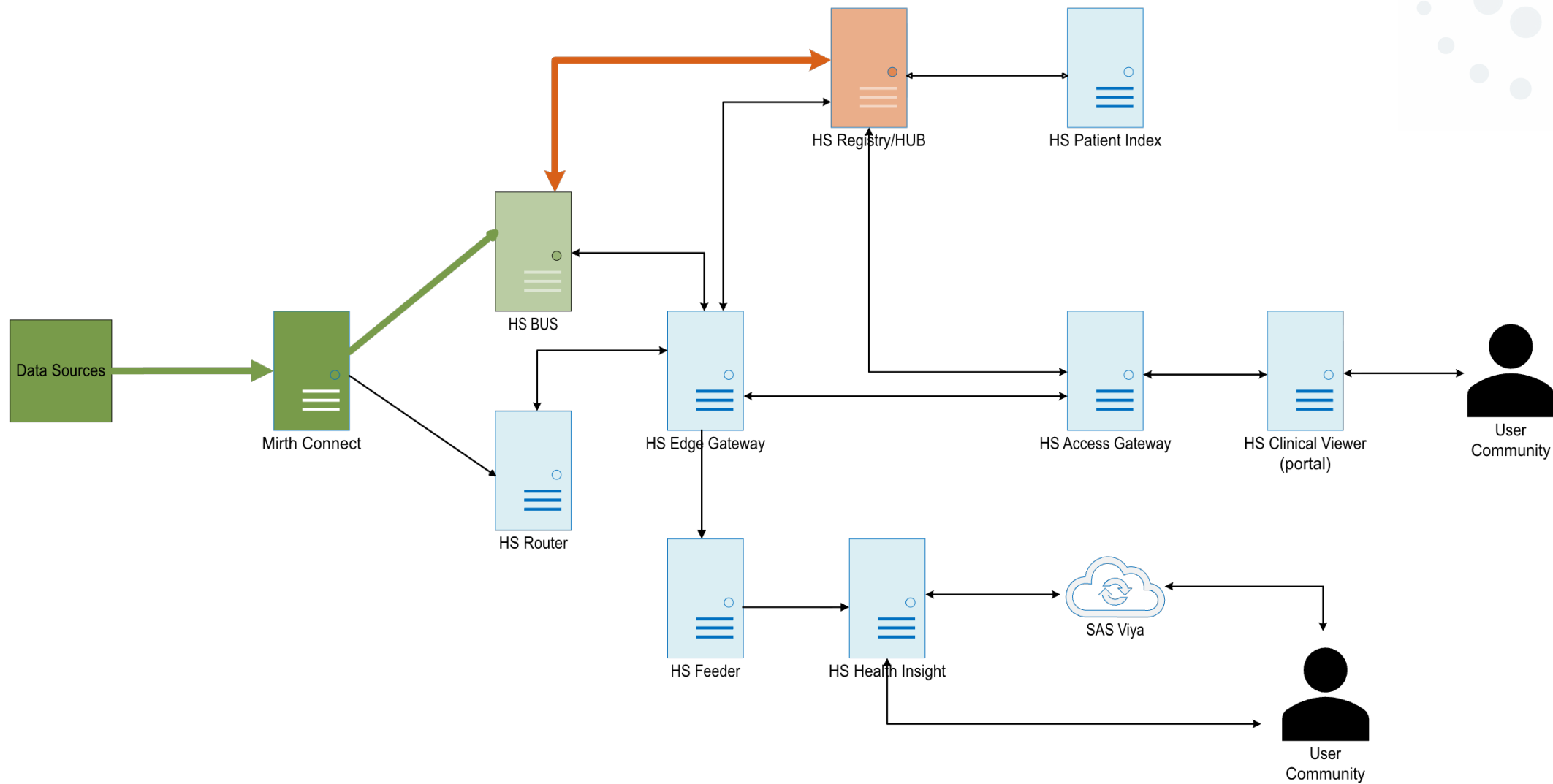
# CCD Message storage in HealthShare



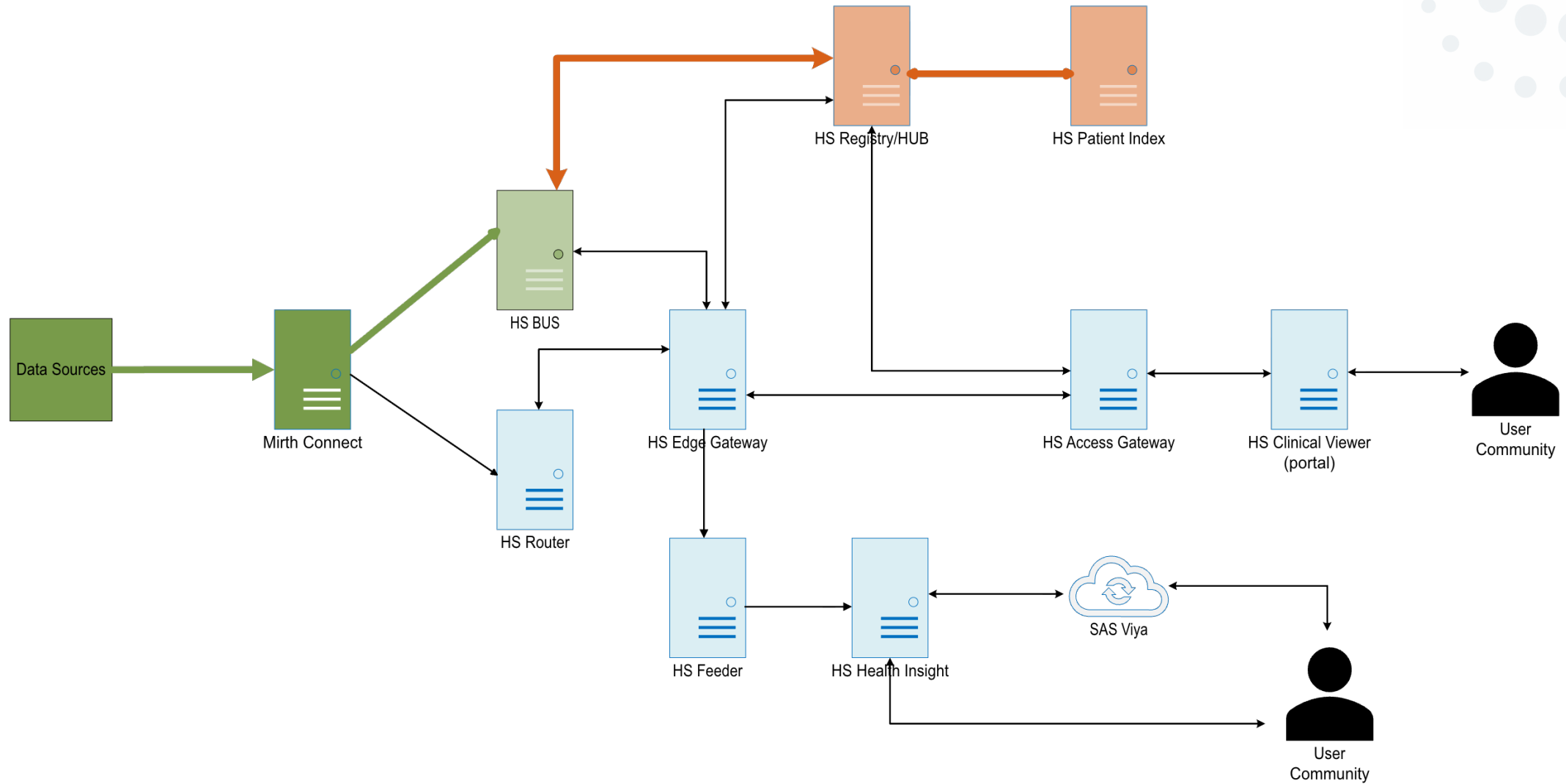
# CCD Message storage in HealthShare



# CCD Message storage in HealthShare

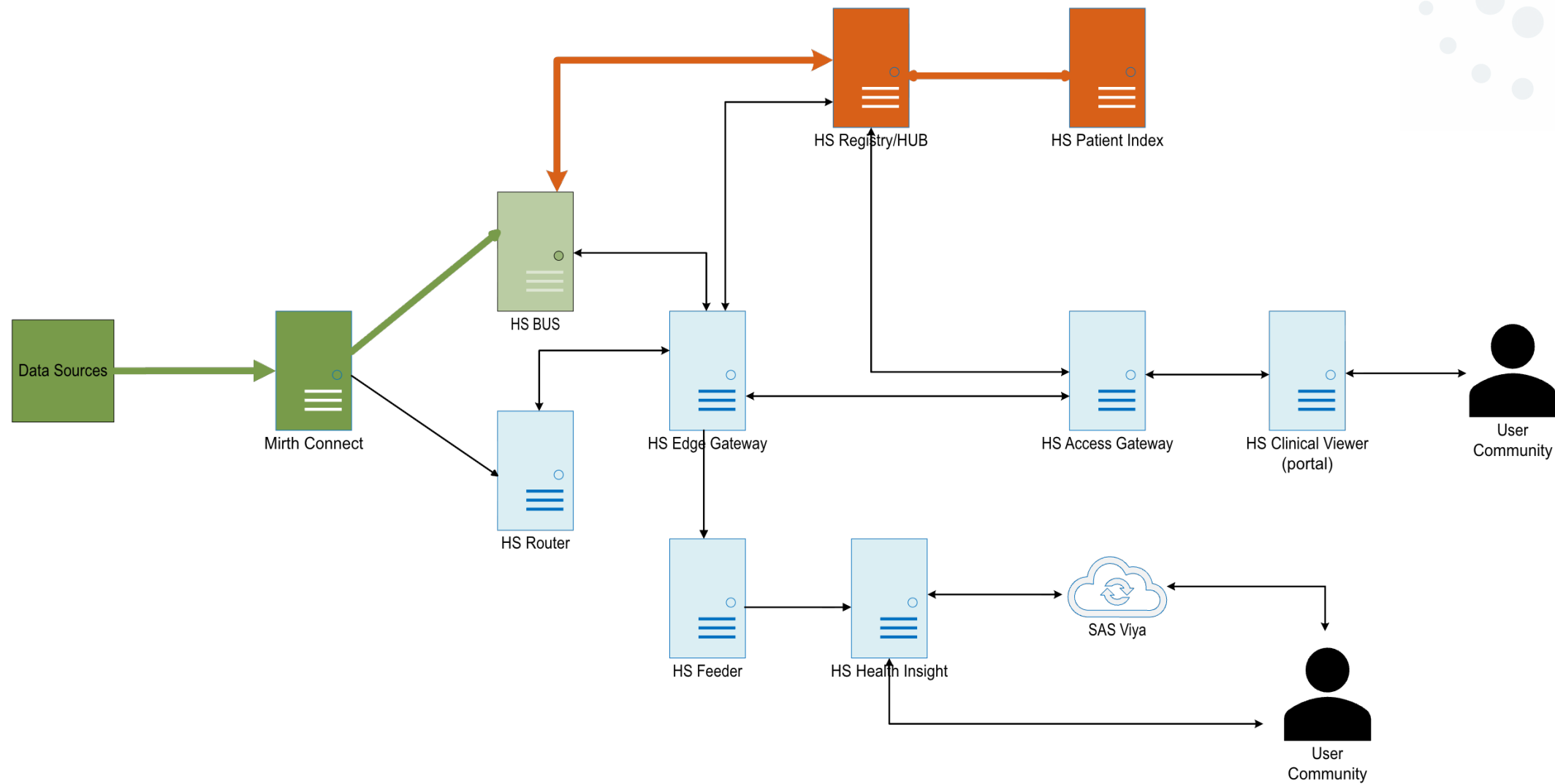


# CCD Message storage in HealthShare

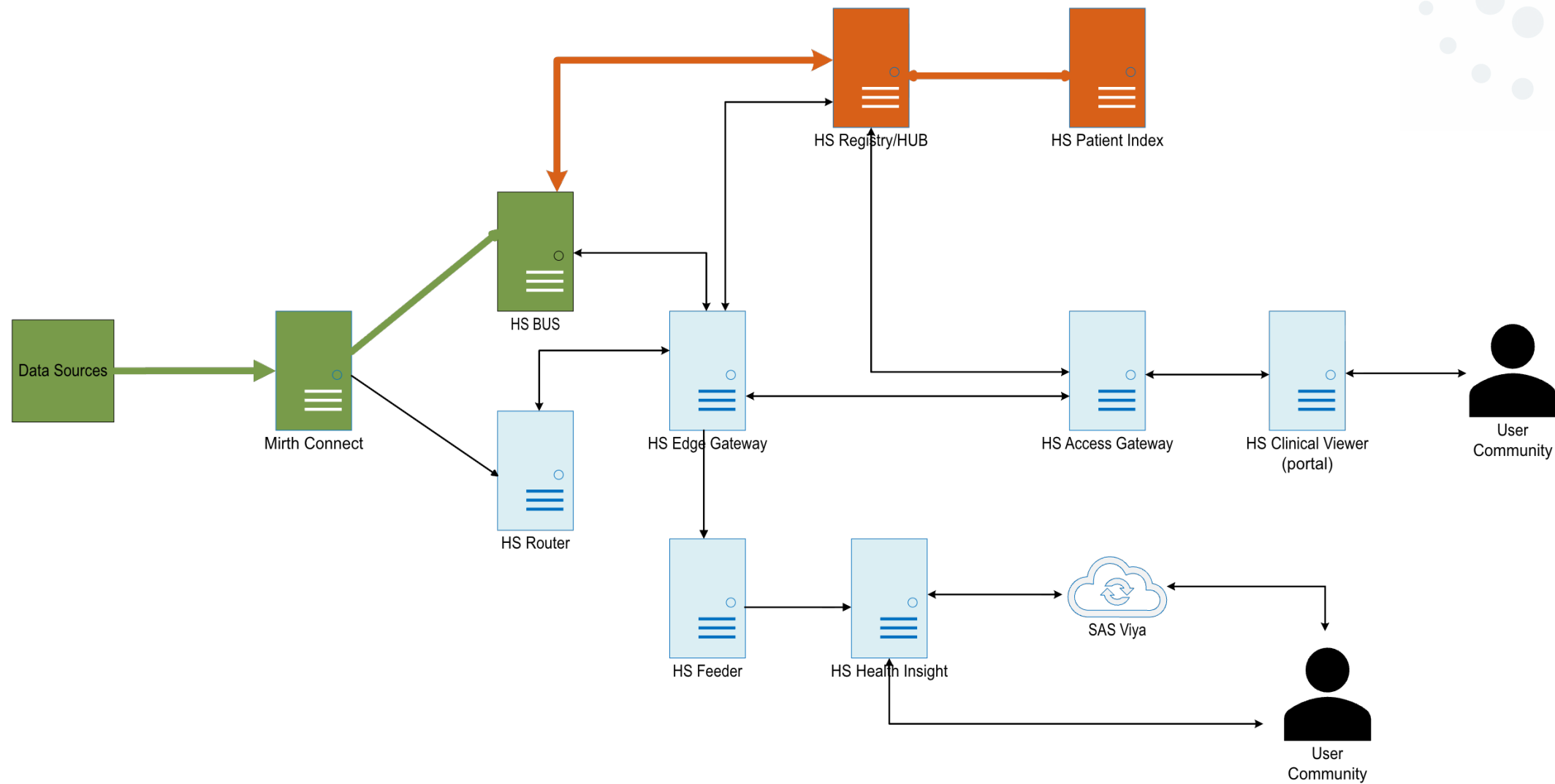




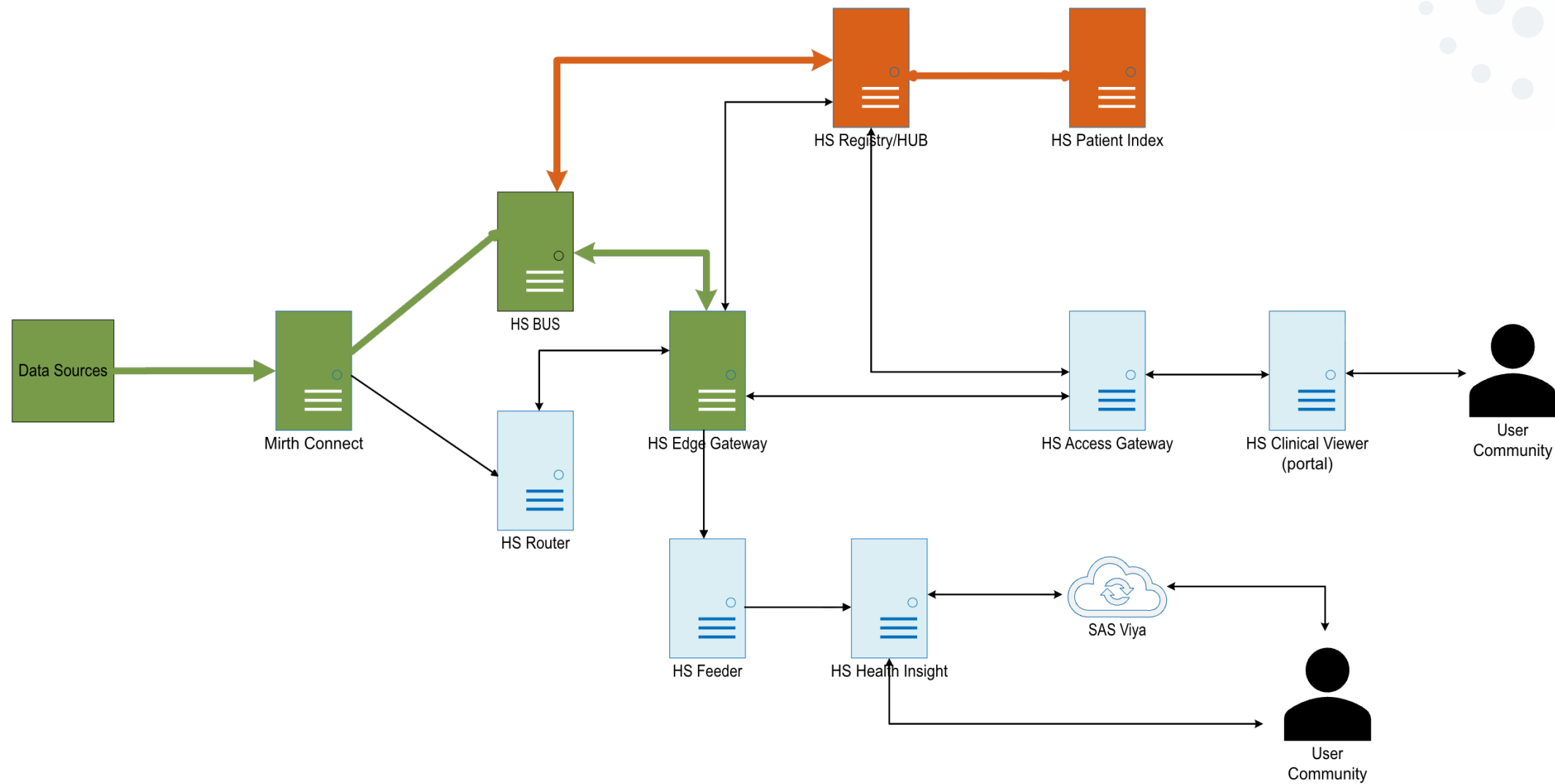
# CCD Message storage in HealthShare



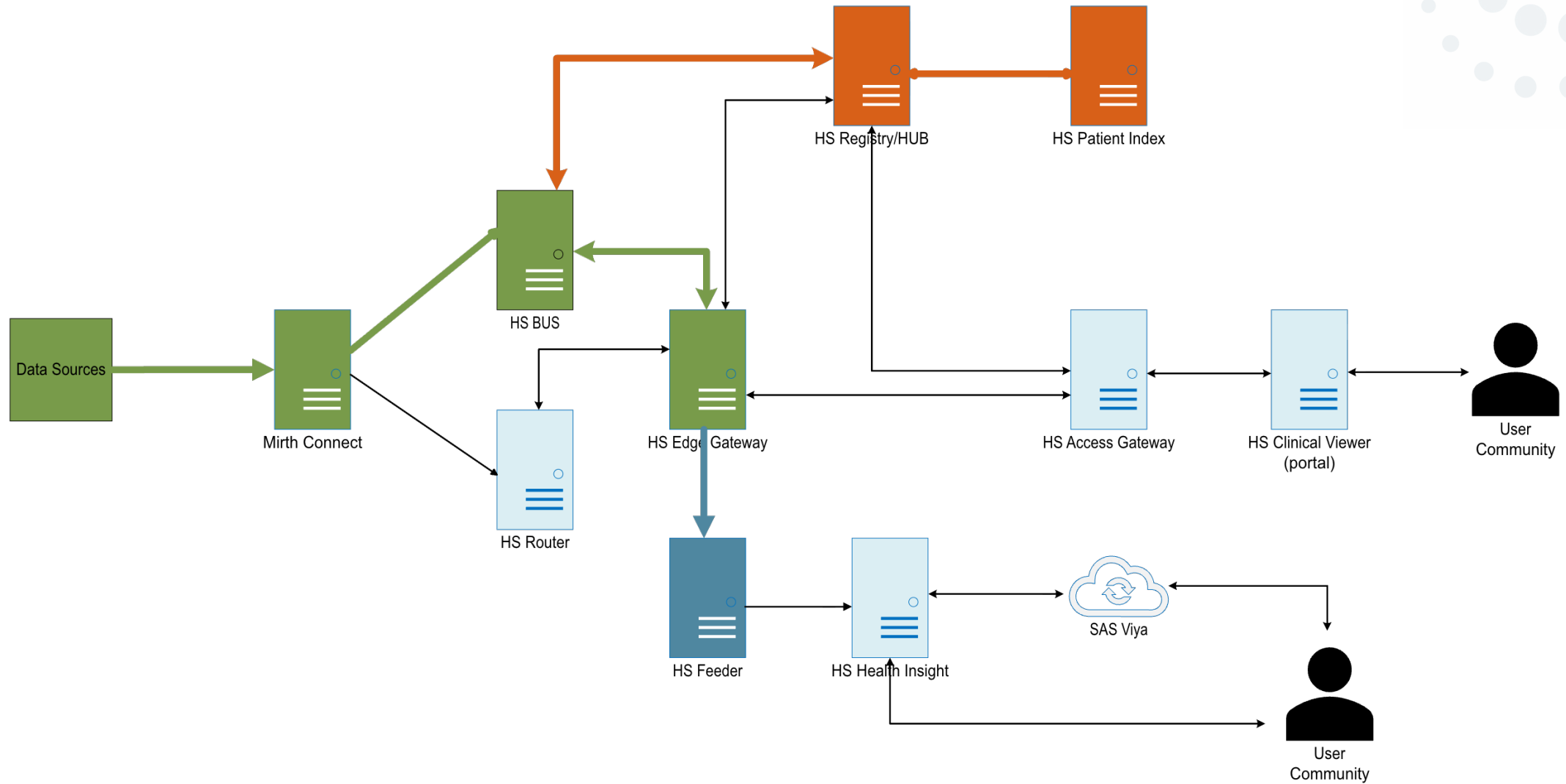
# CCD Message storage in HealthShare



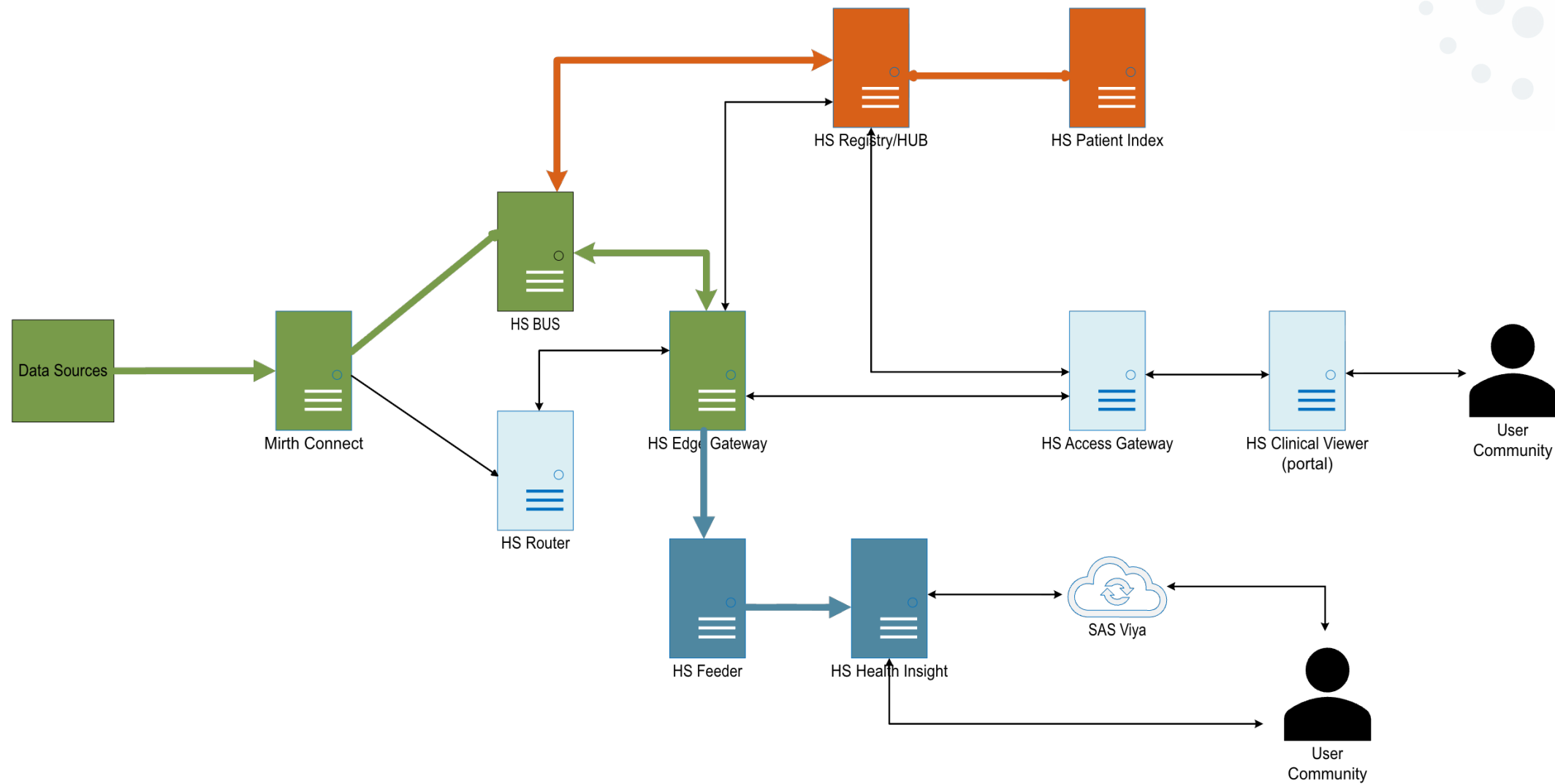
# CCD Message storage in HealthShare



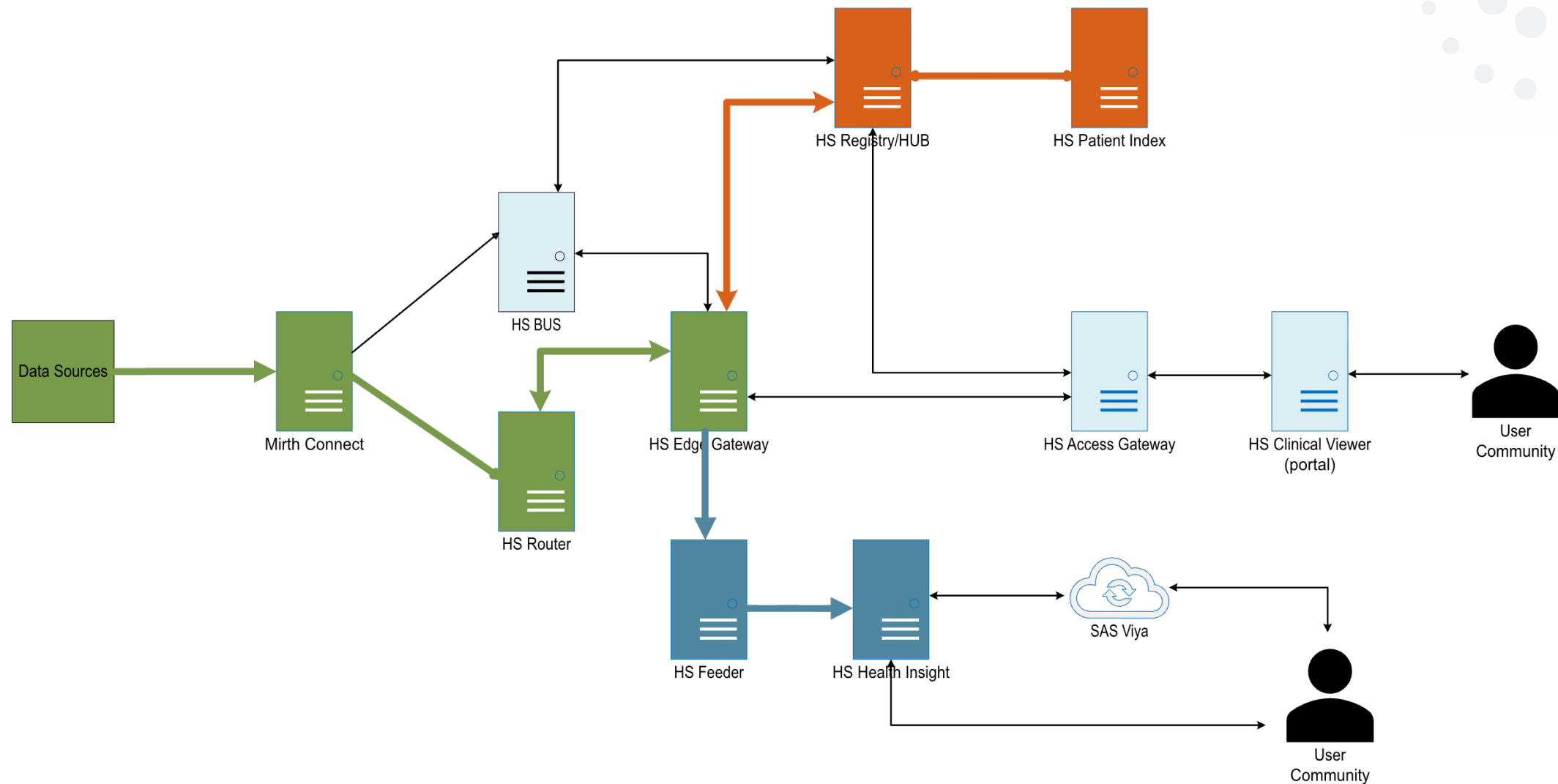
# CCD Message storage in HealthShare



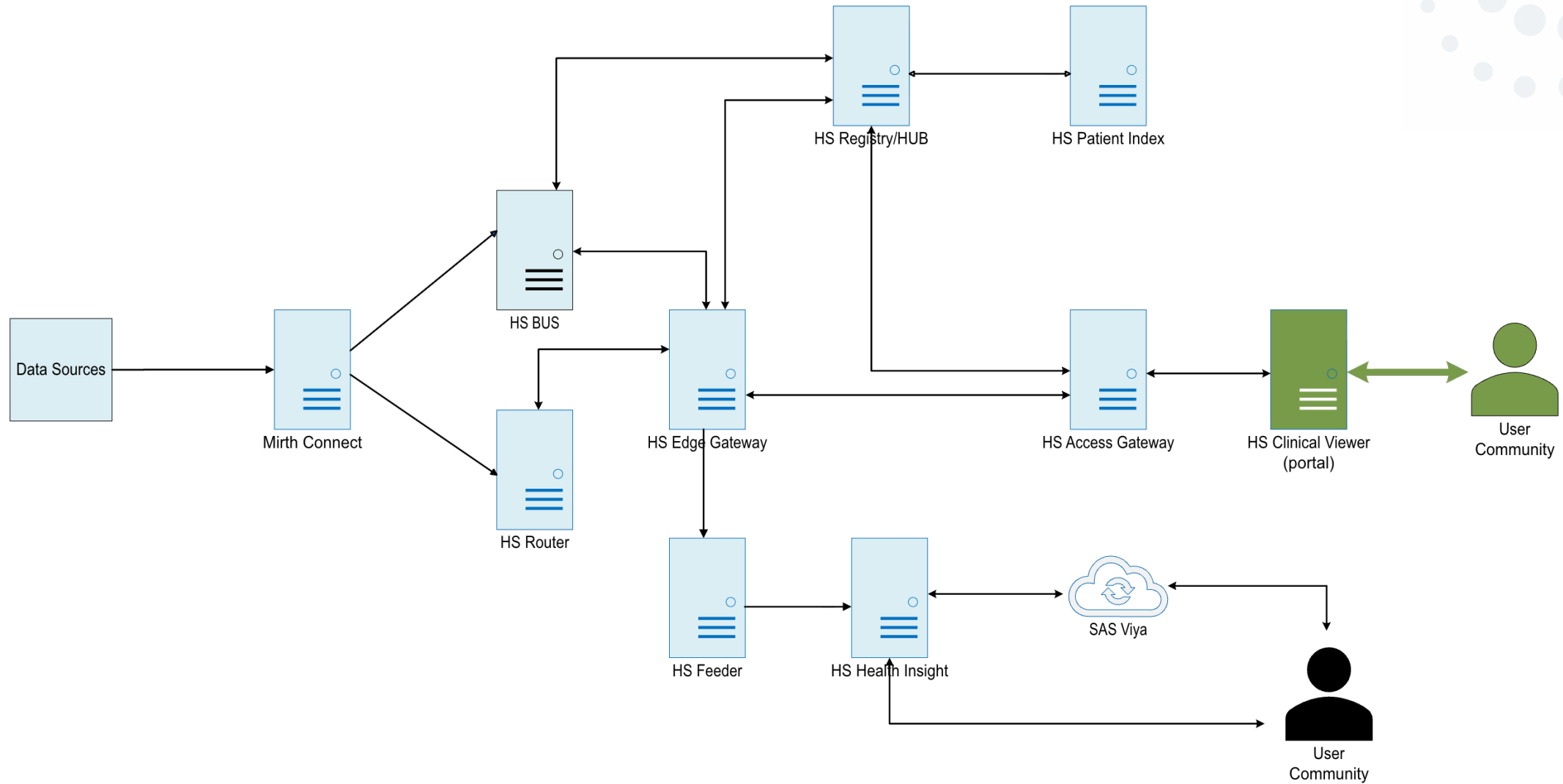
# CCD Message storage in HealthShare



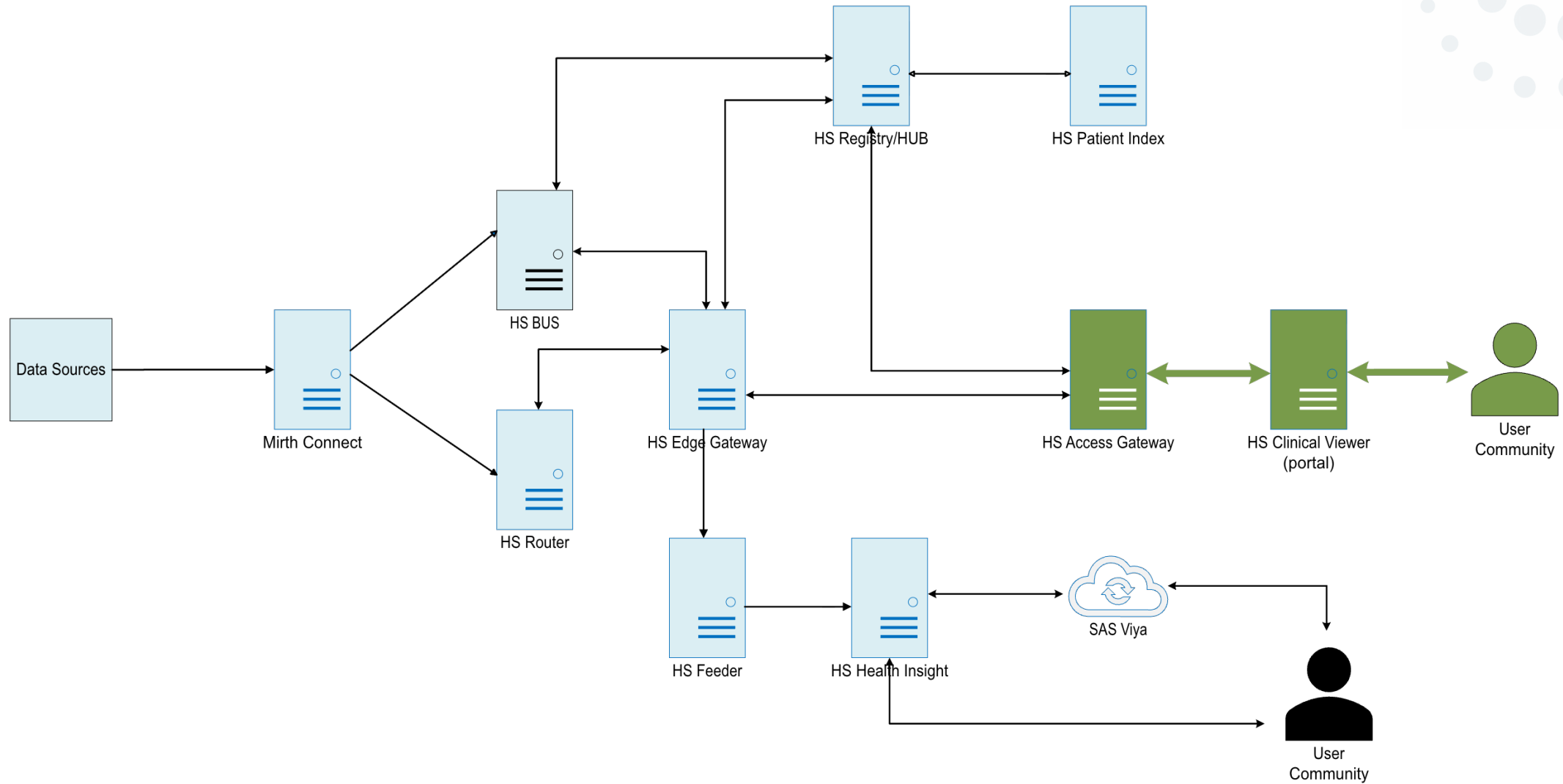
# HL7 Message storage in HealthShare



# HealthShare Clinical Viewer

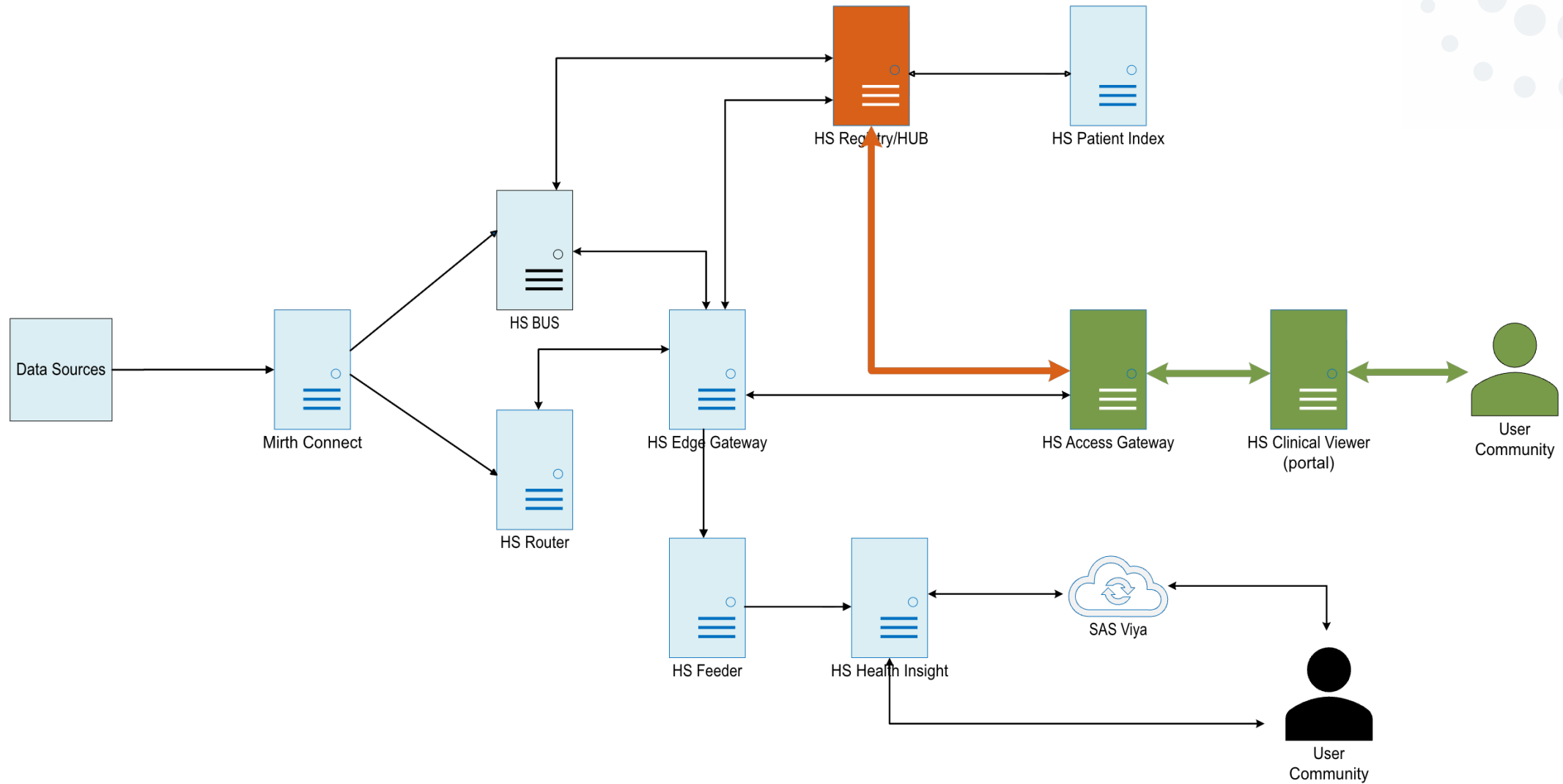


# HealthShare Clinical Viewer

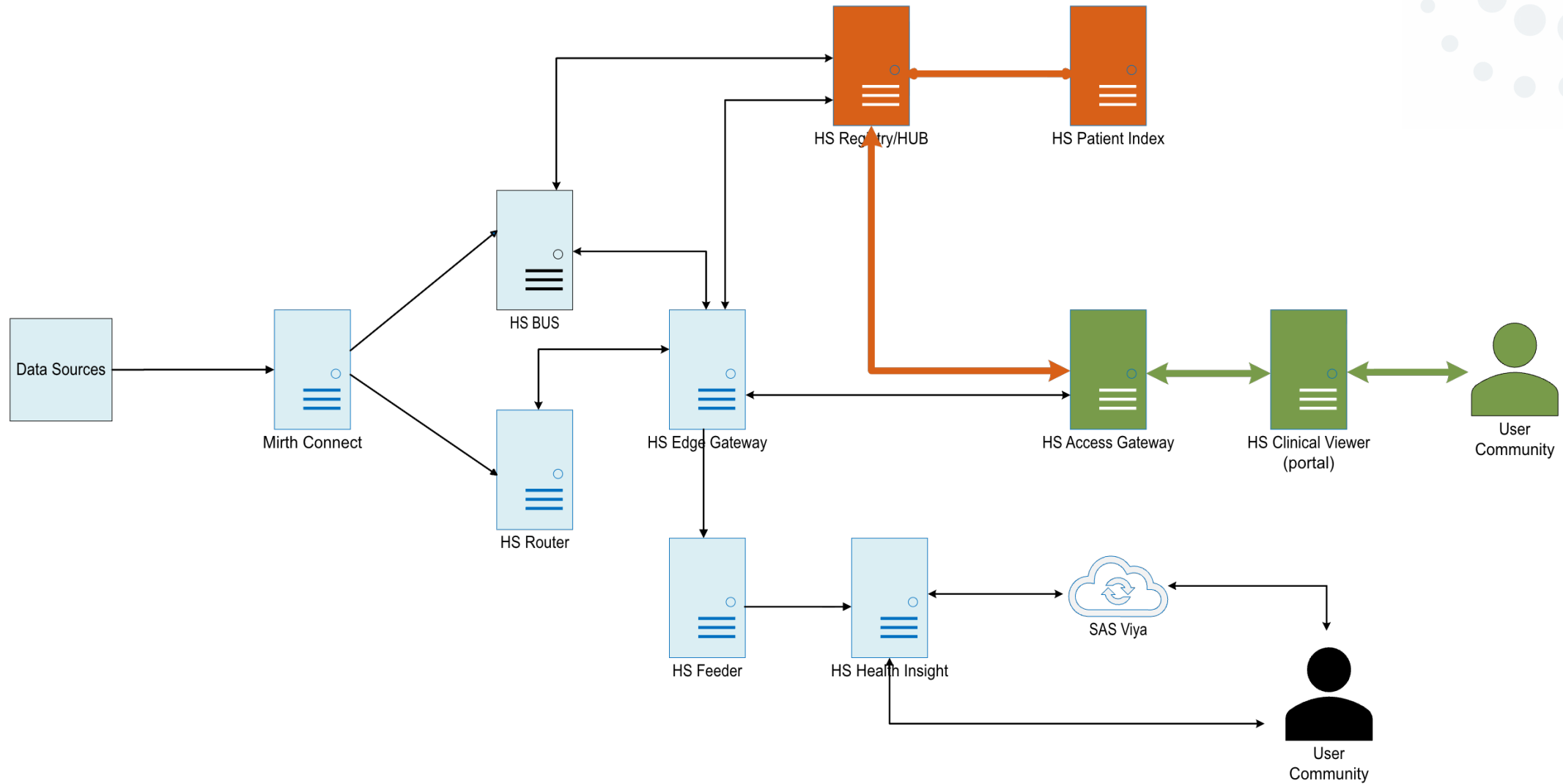




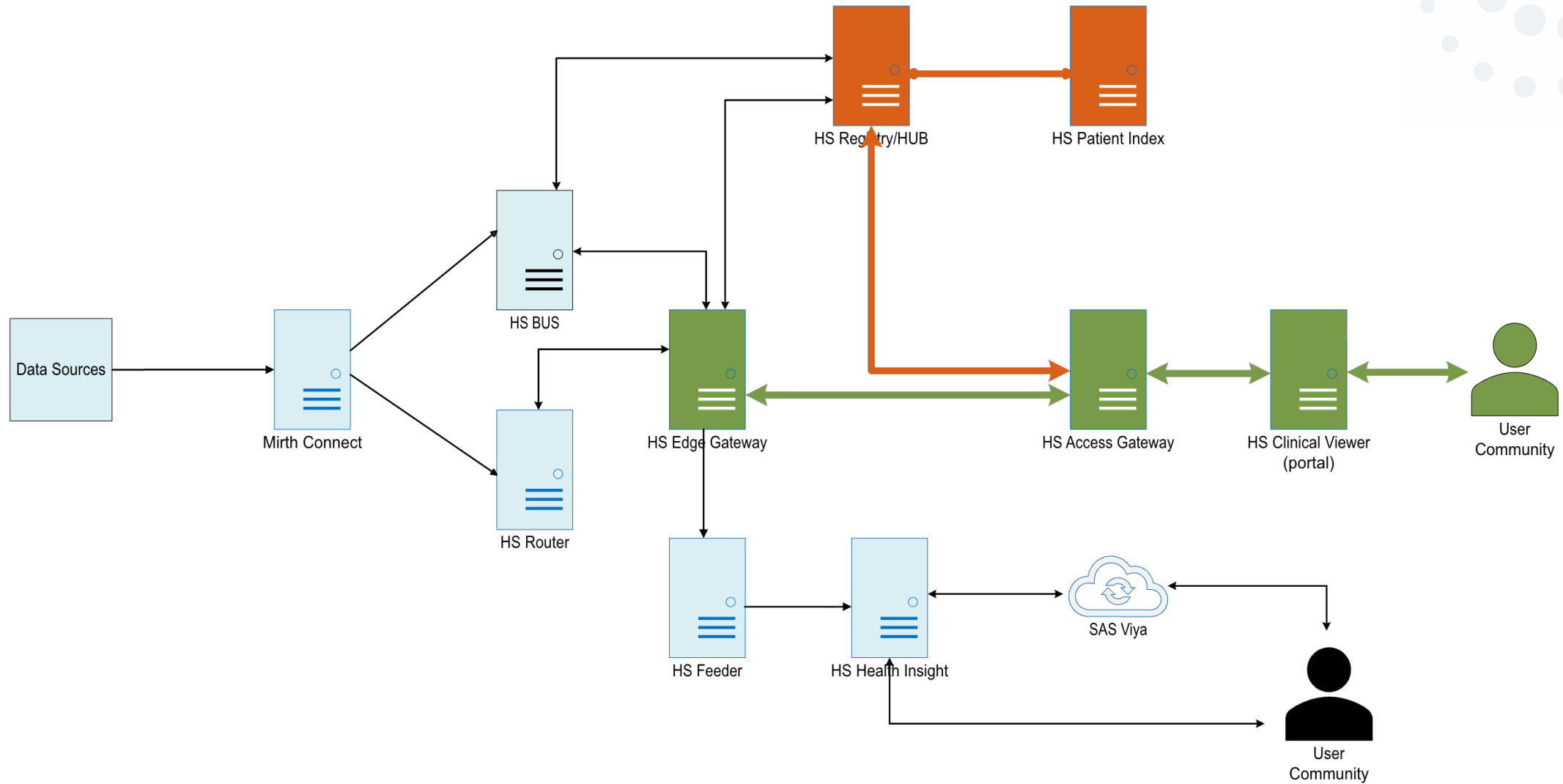
# HealthShare Clinical Viewer



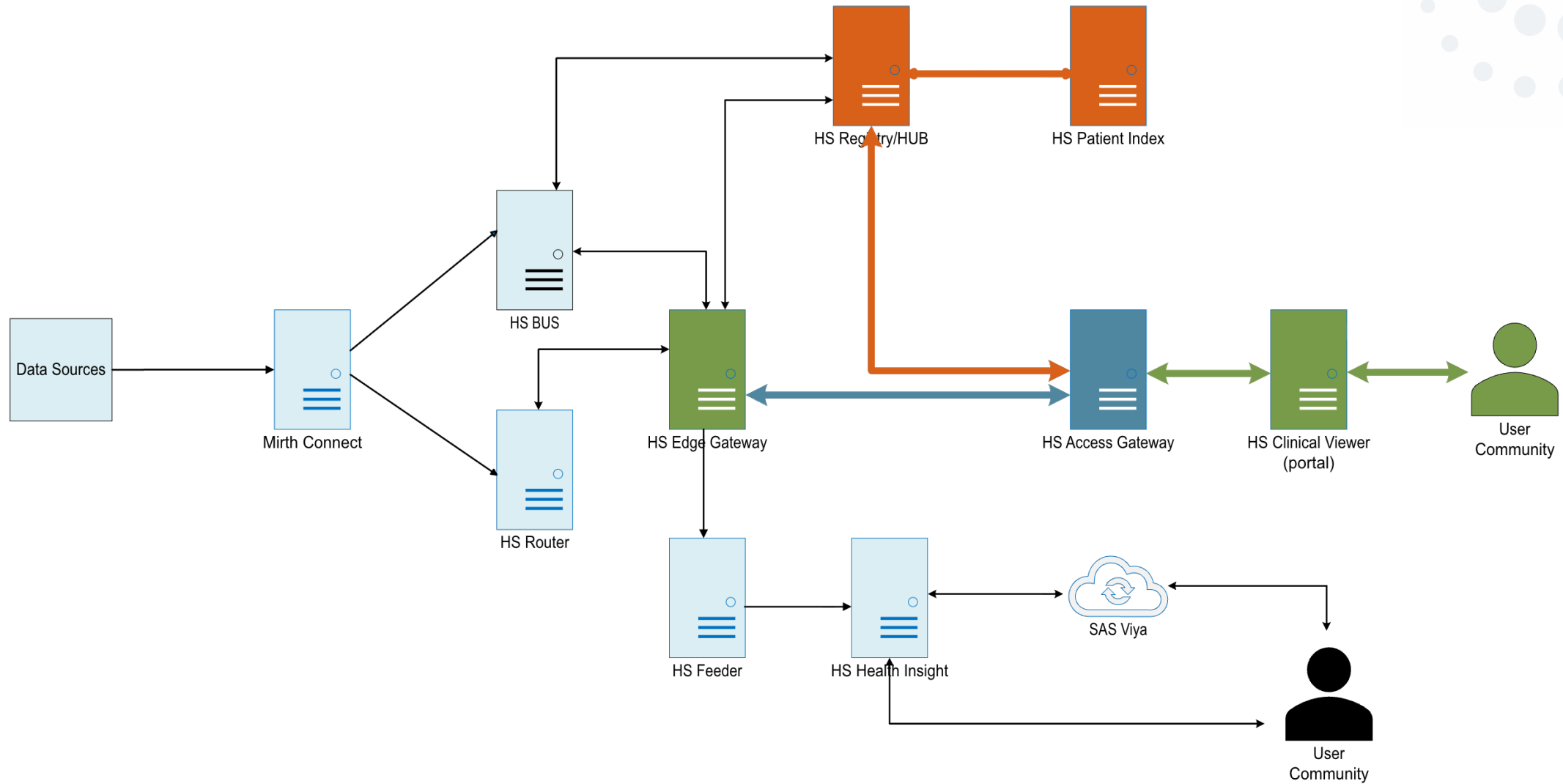
# HealthShare Clinical Viewer



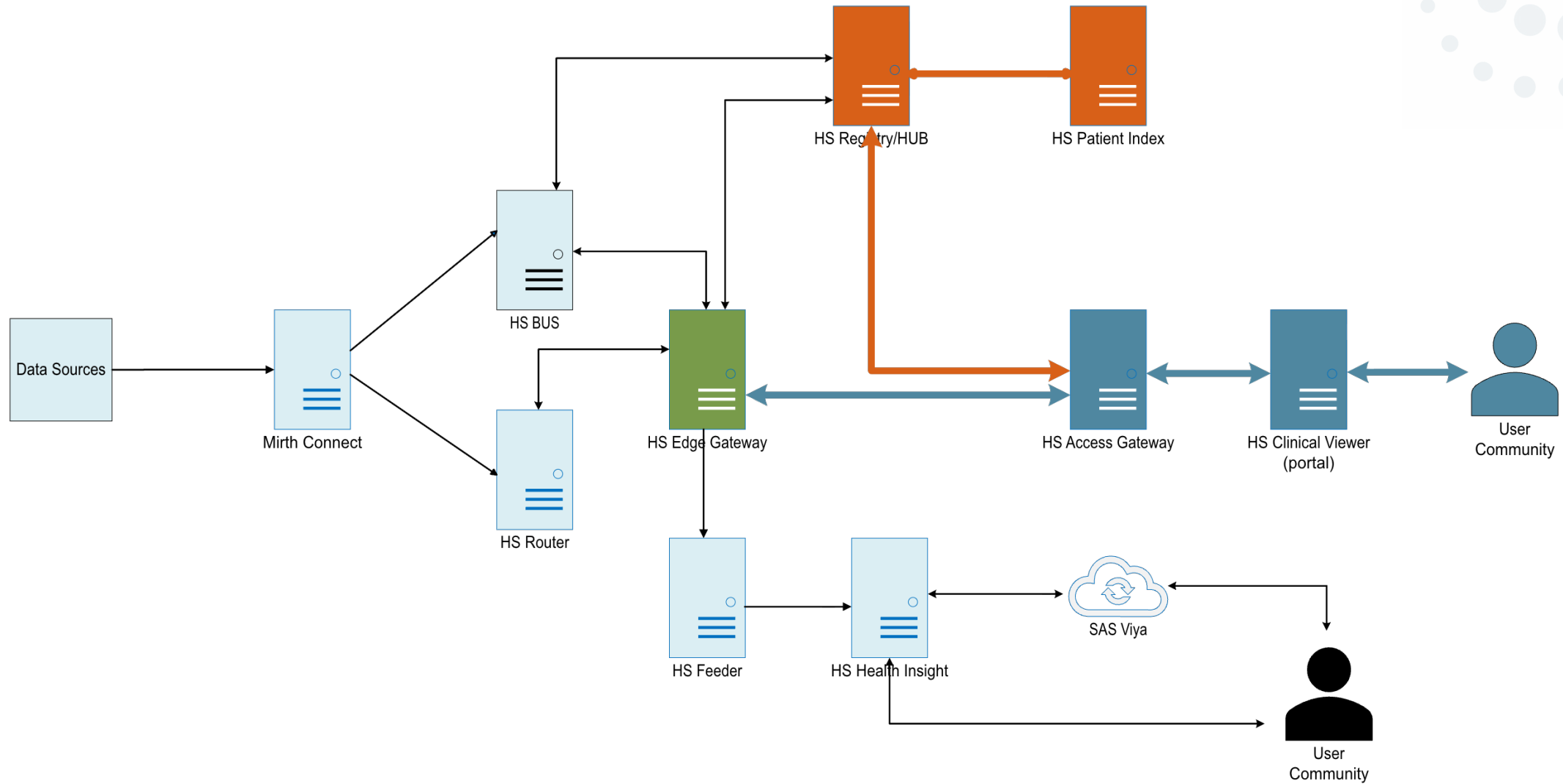
# HealthShare Clinical Viewer



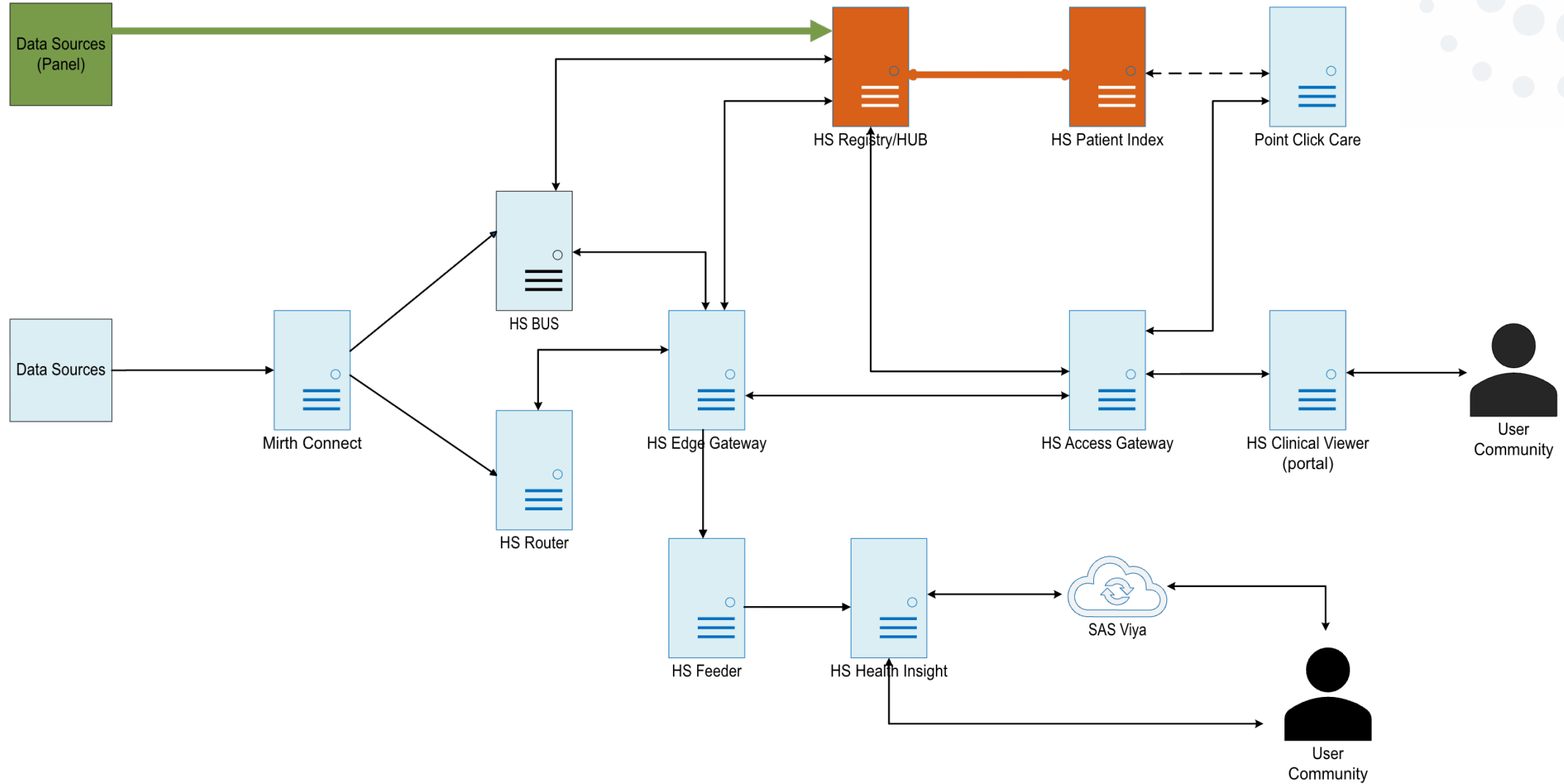
# HealthShare Clinical Viewer



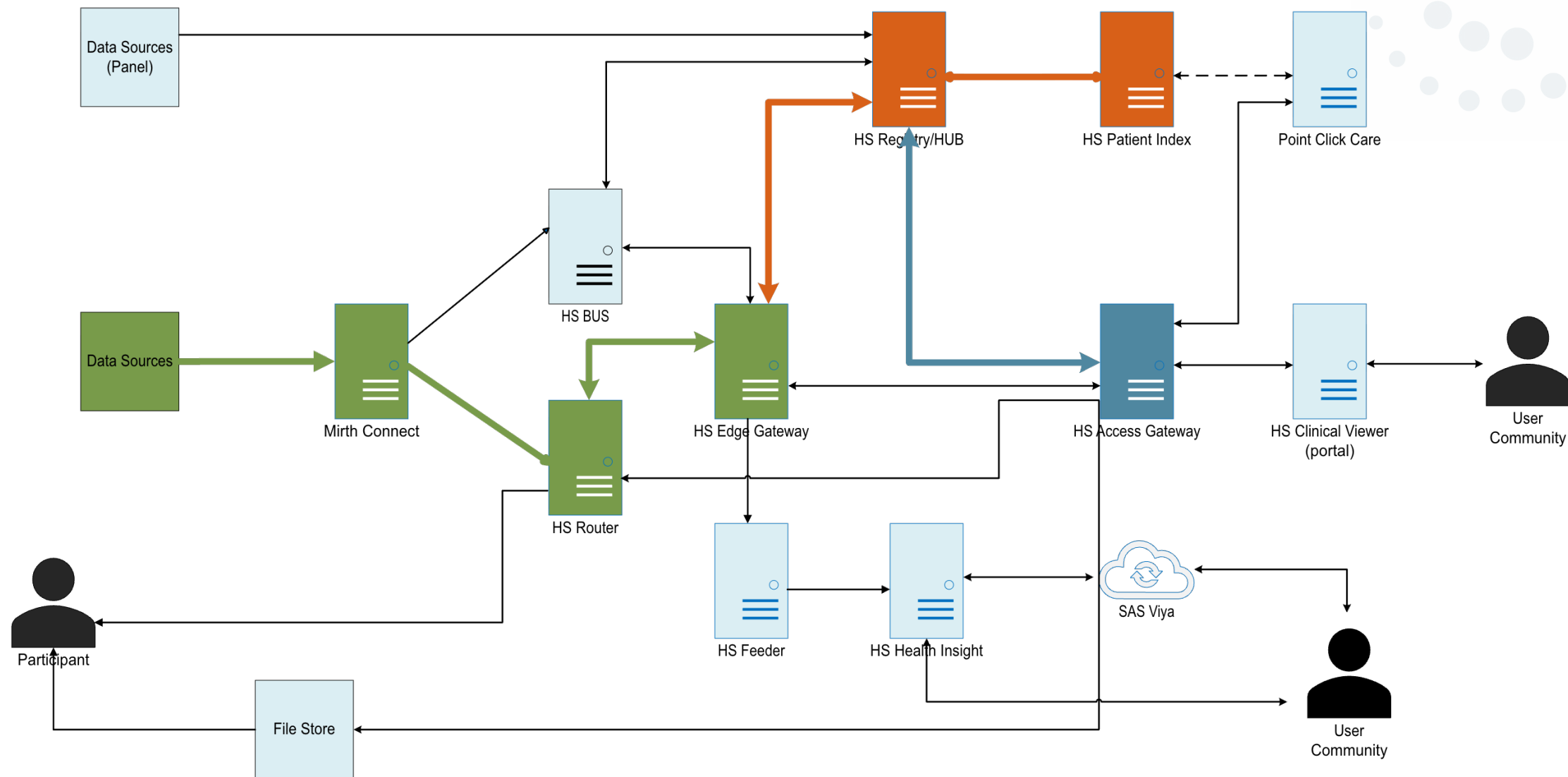
# HealthShare Clinical Viewer



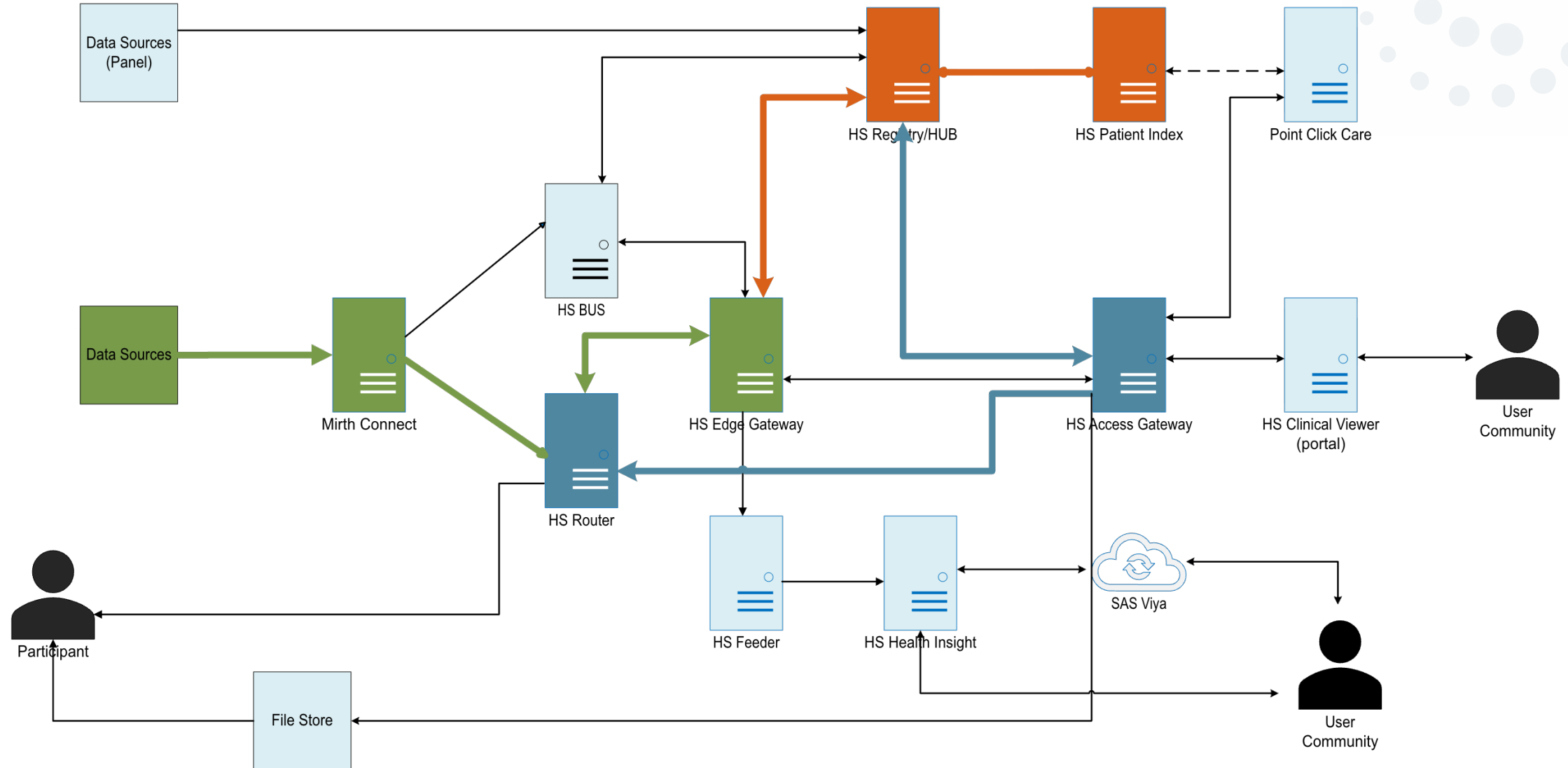
# NC\*Notify Base – Panel Loading



# NC\*Notify Base – Messaging/Notification

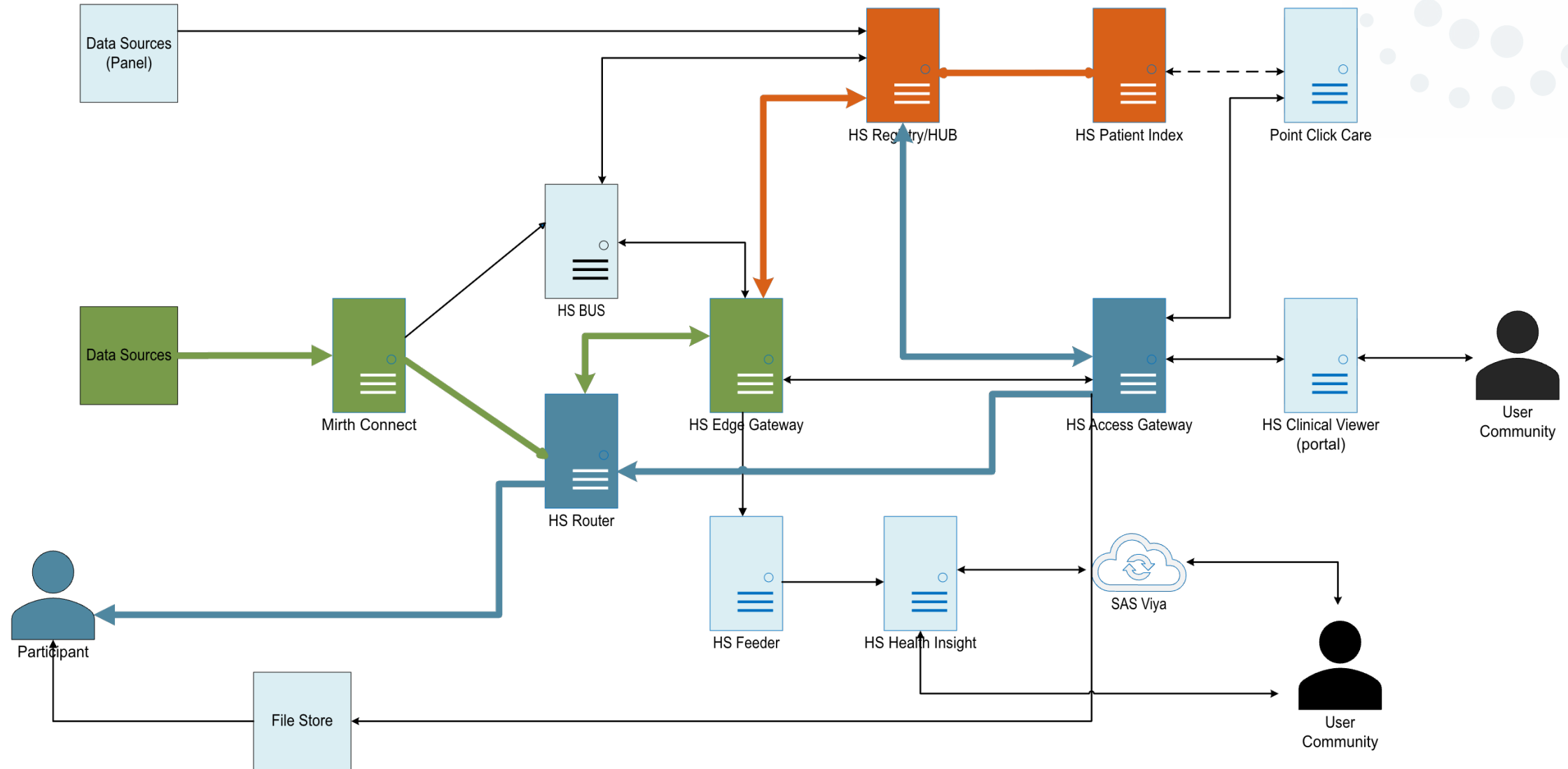


# NC\*Notify Base – Messaging/Notification

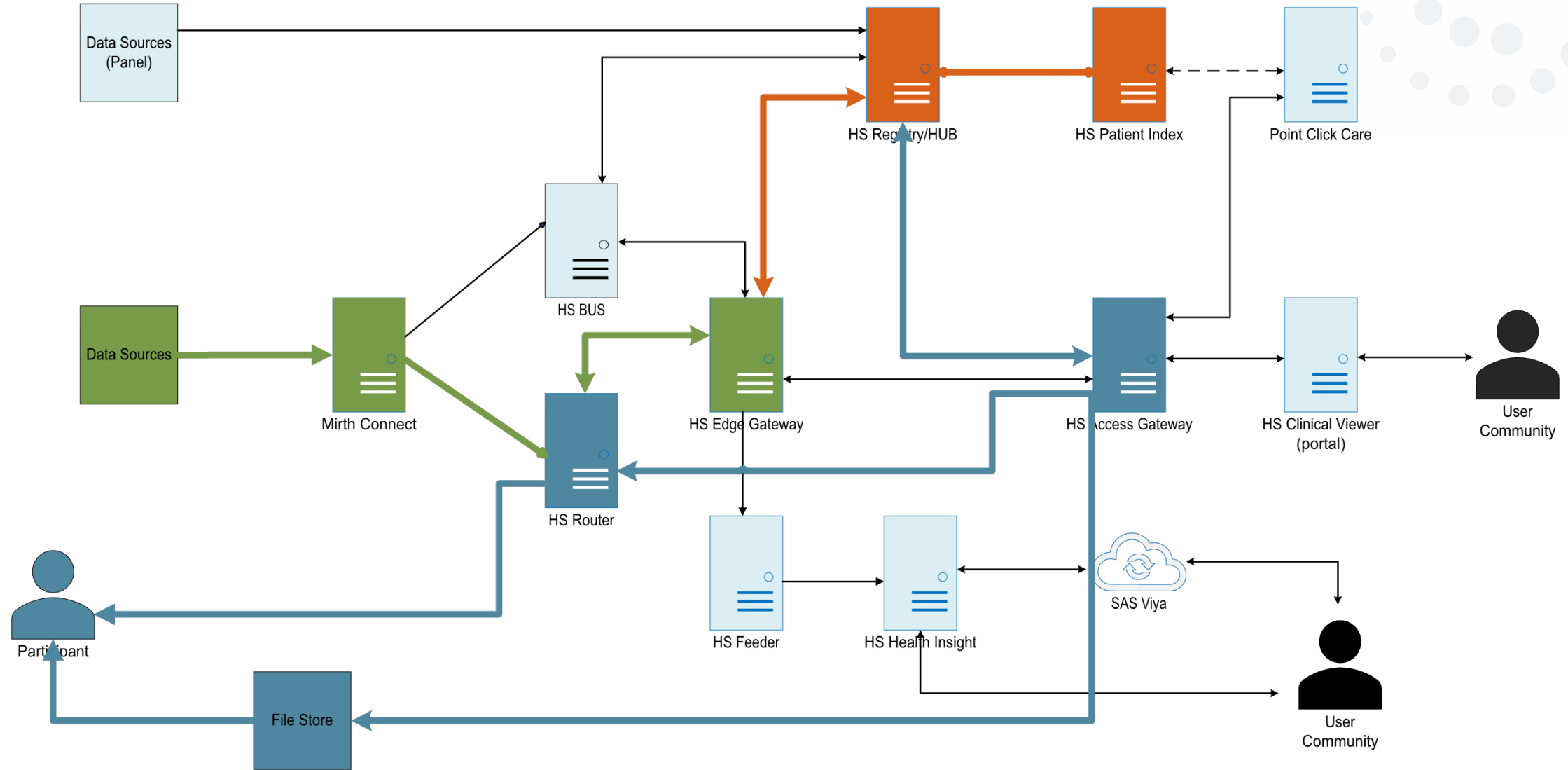




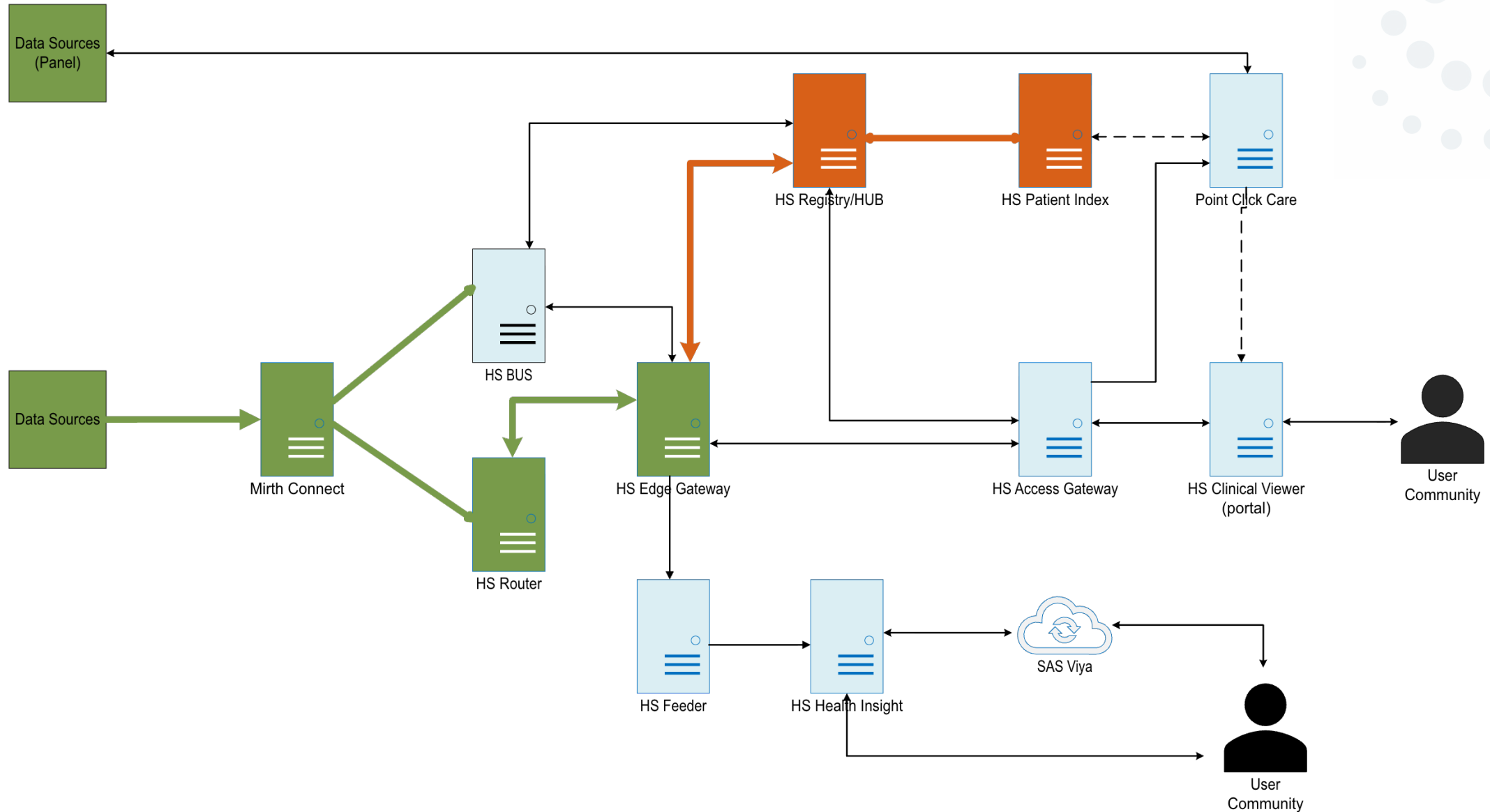
# NC\*Notify Base – Messaging/Notification



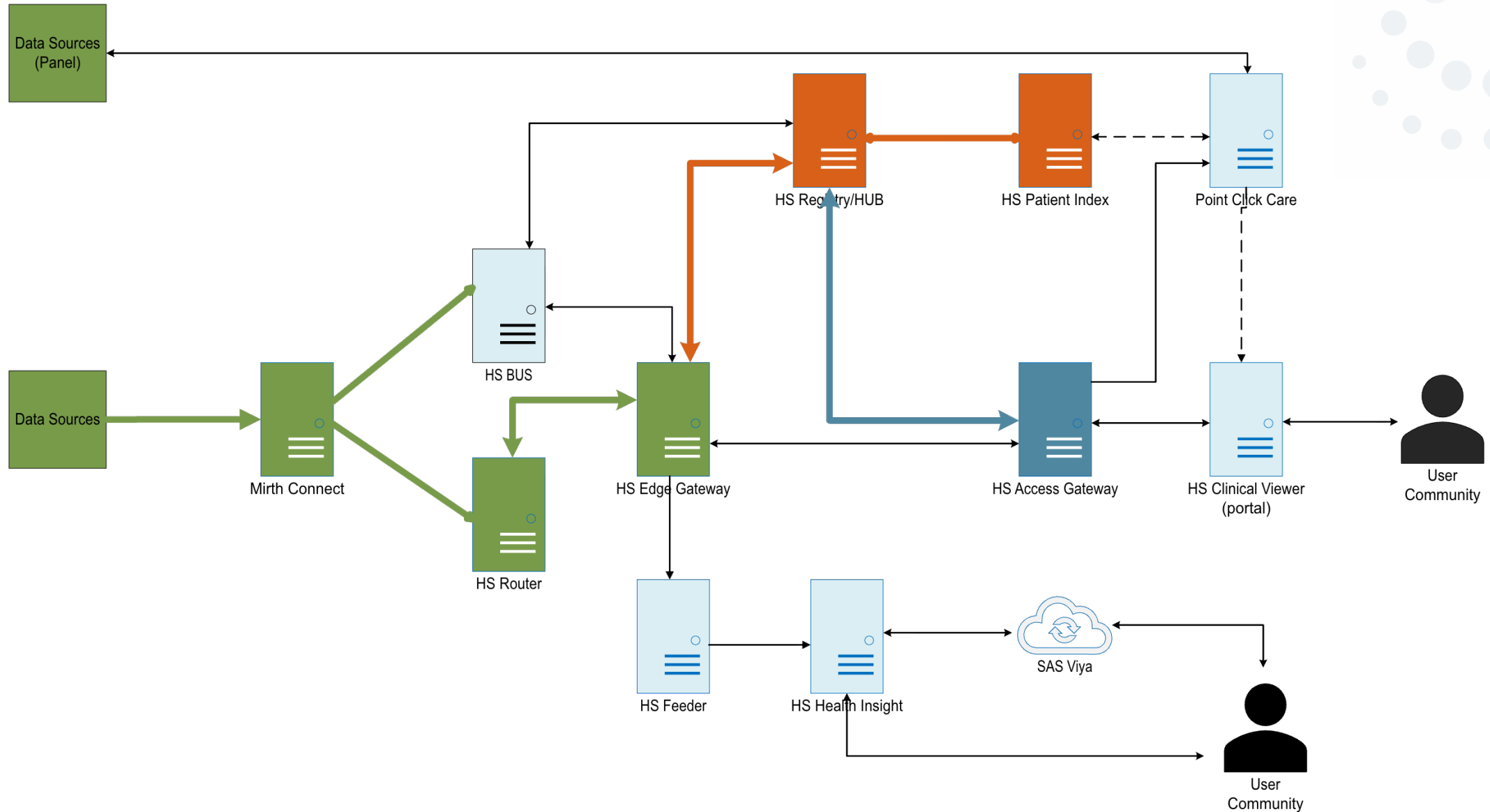
# NC\*Notify Base – Messaging/Notification



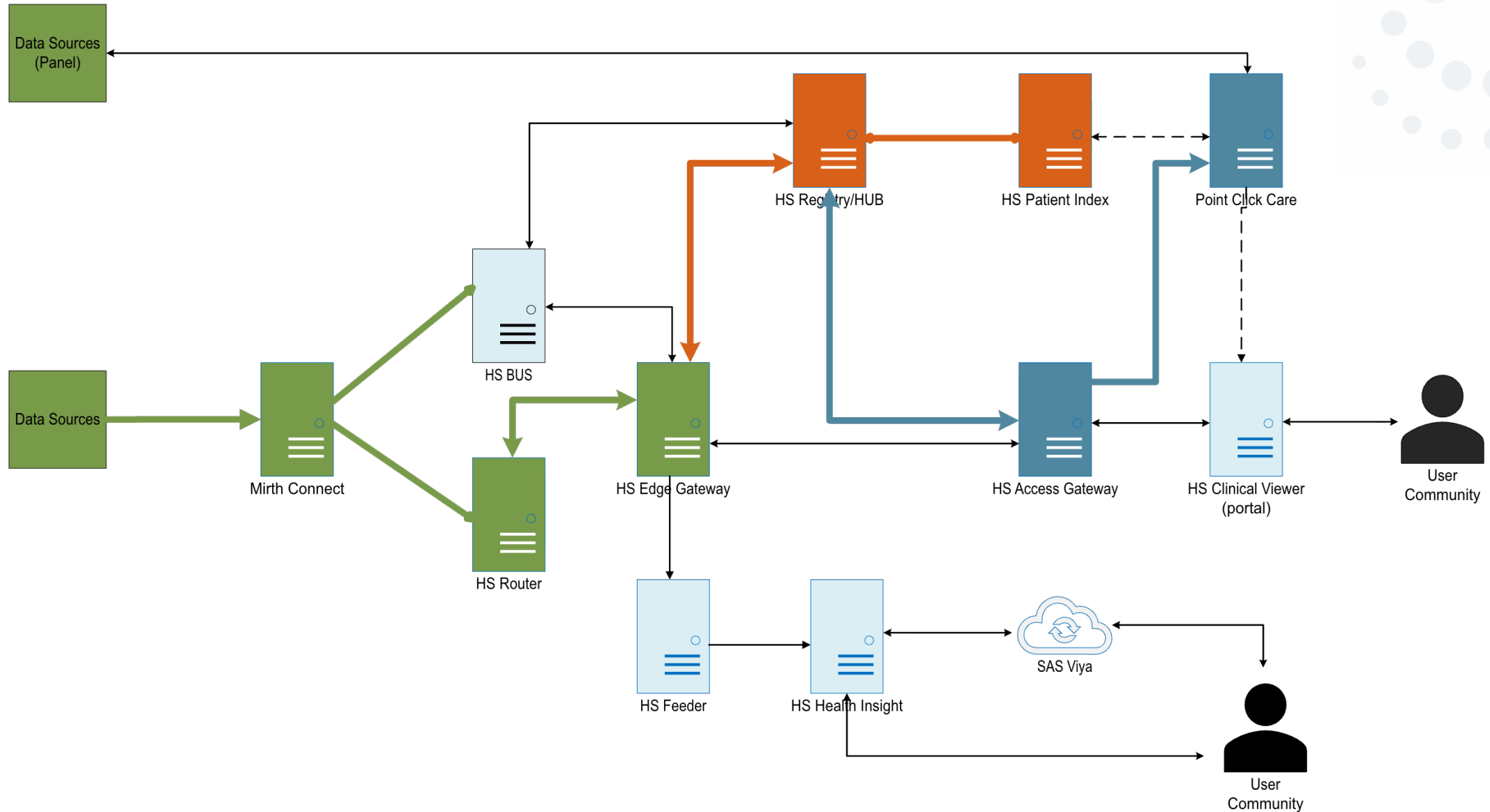
# NC\*Notify Plus



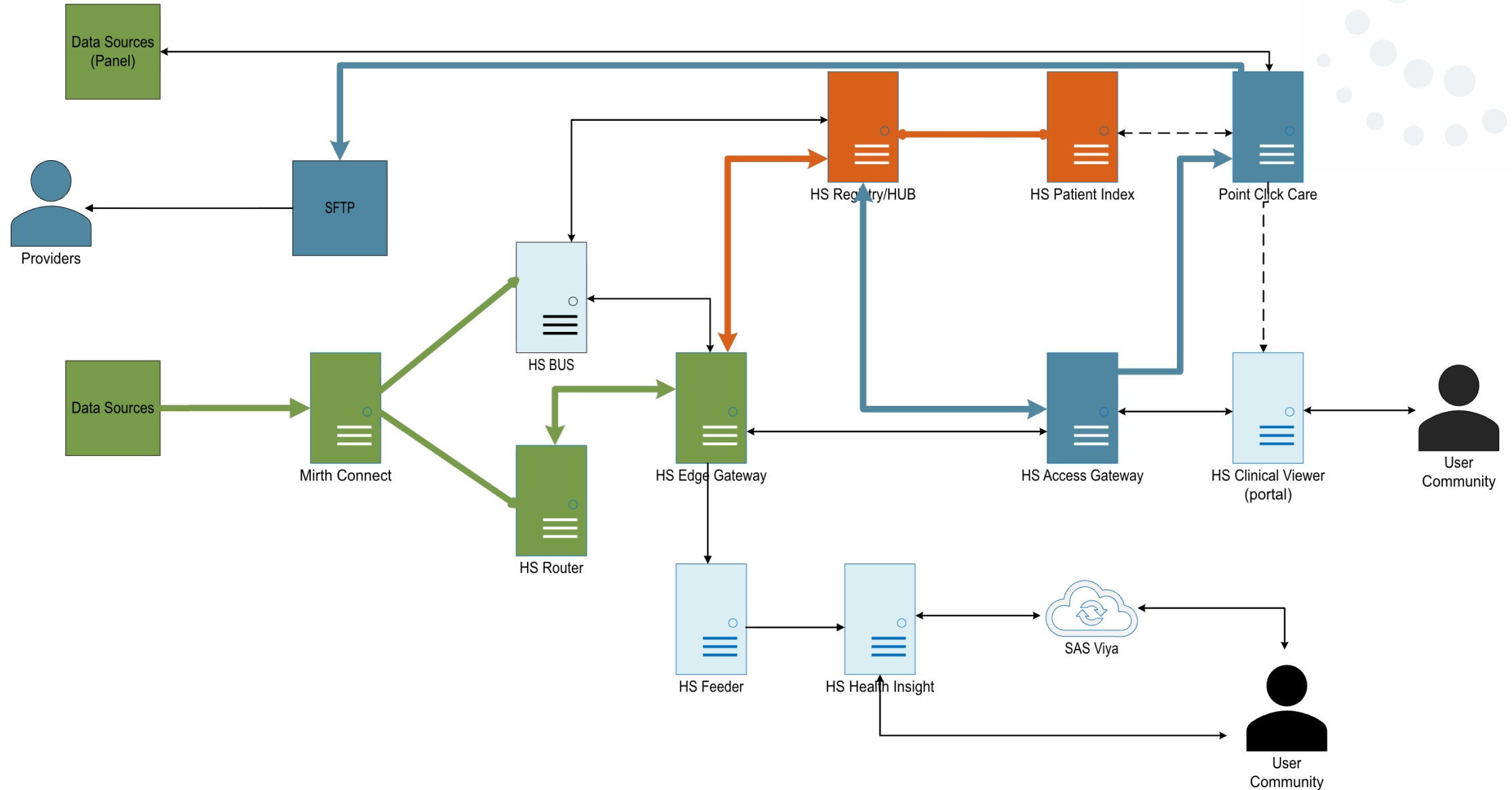
# NC\*Notify Plus



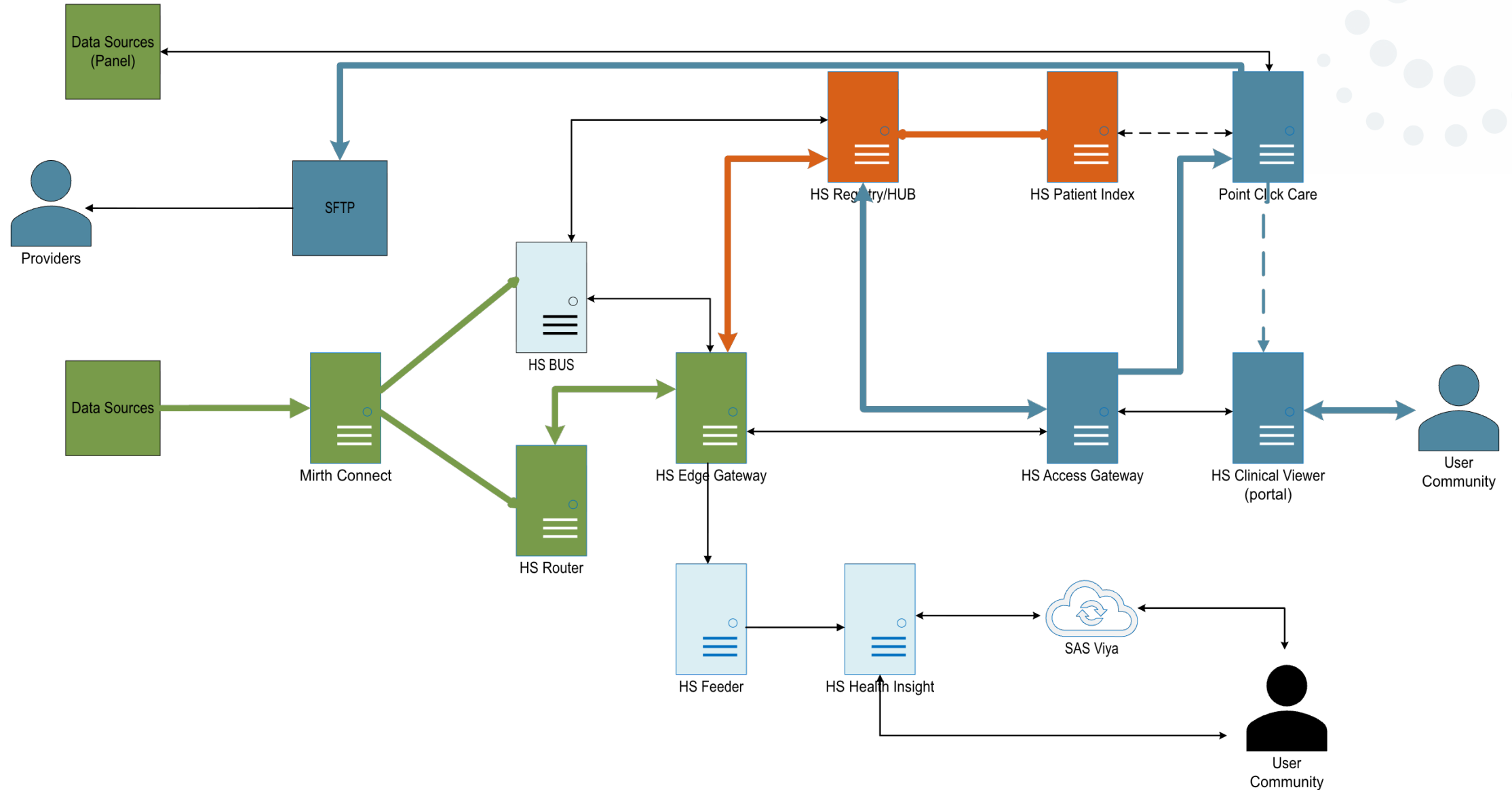
# NC\*Notify Plus



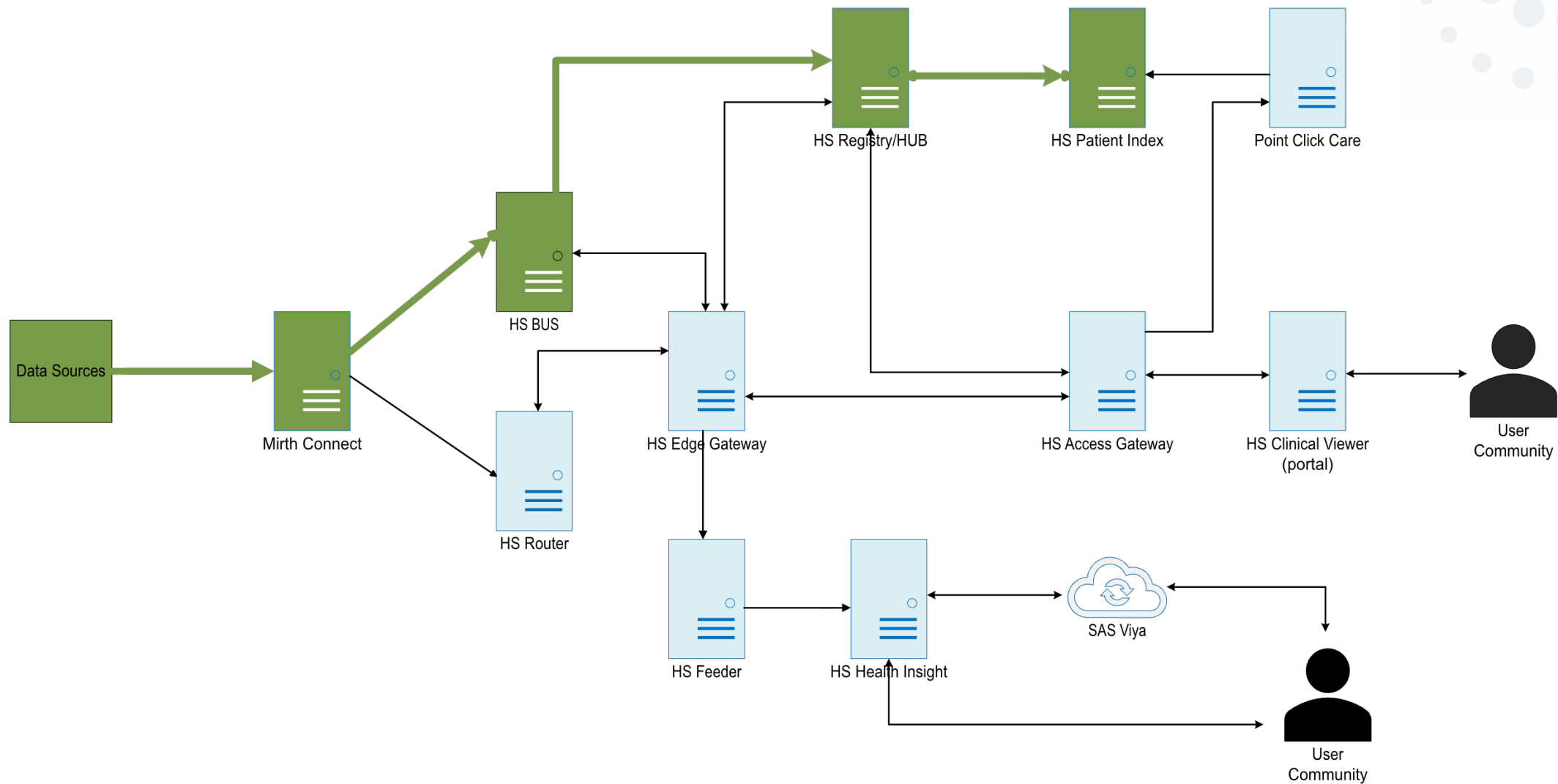
# NC\*Notify Plus



# NC\*Notify Plus

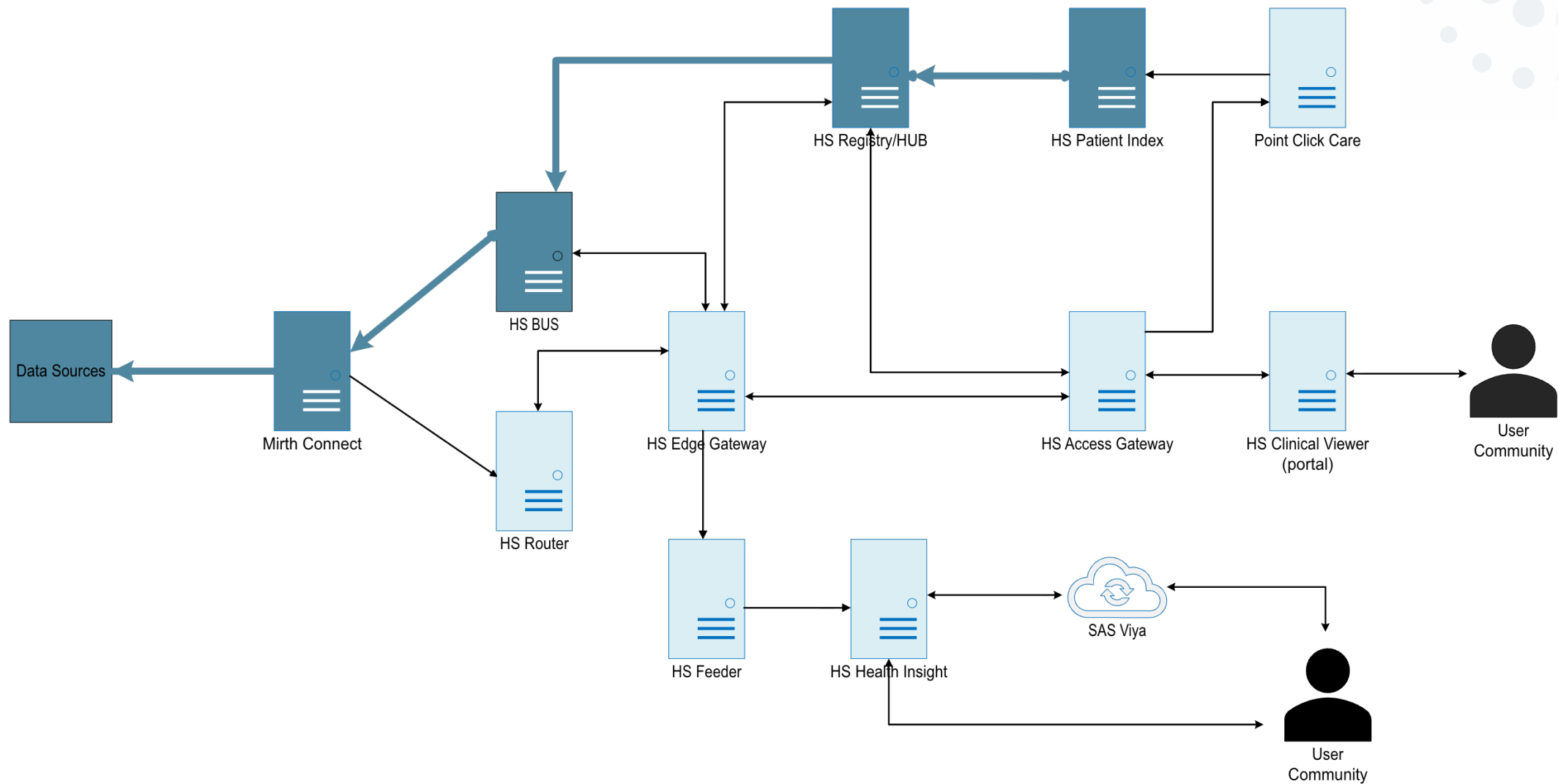


# Bi-directional

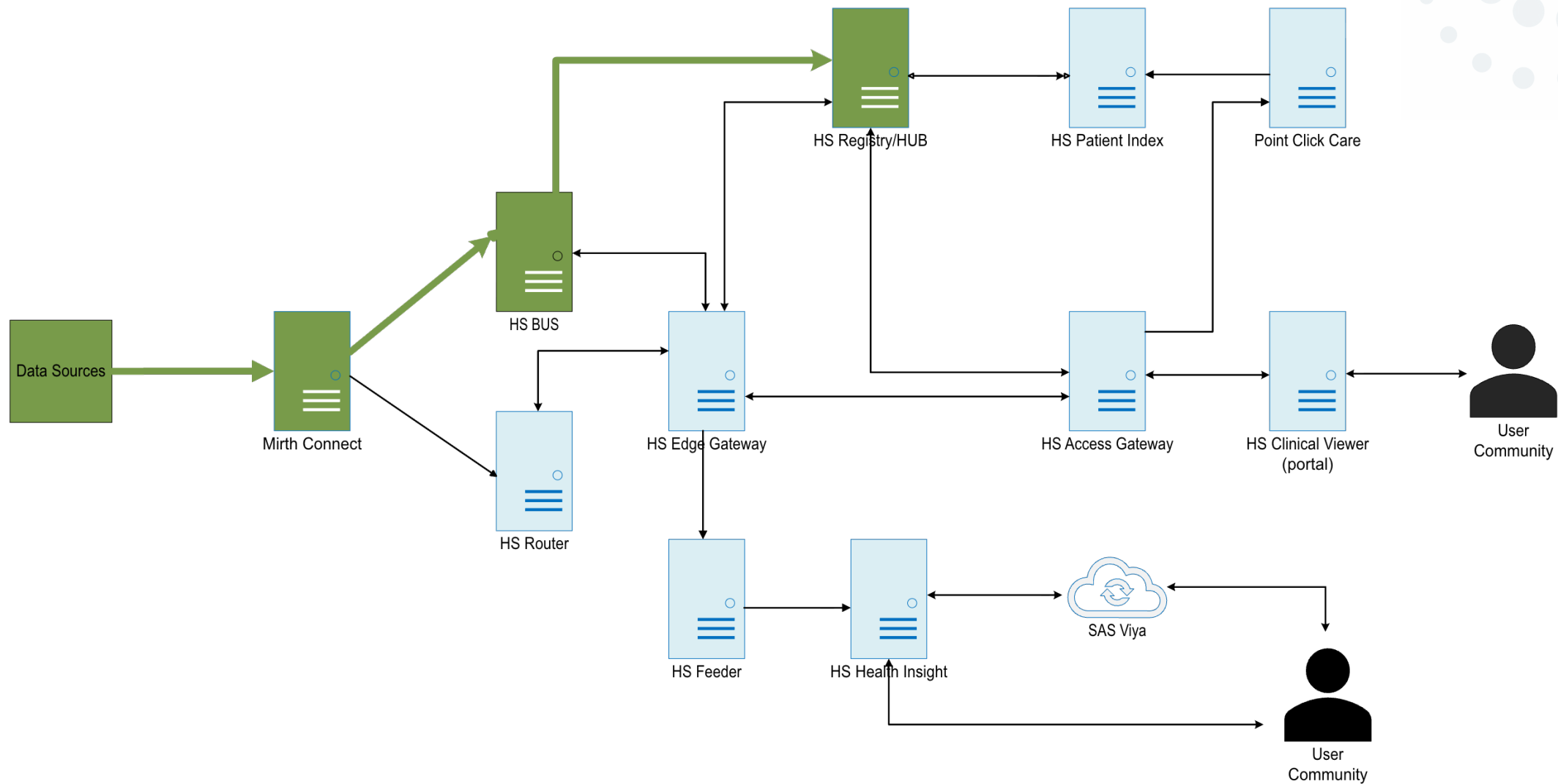




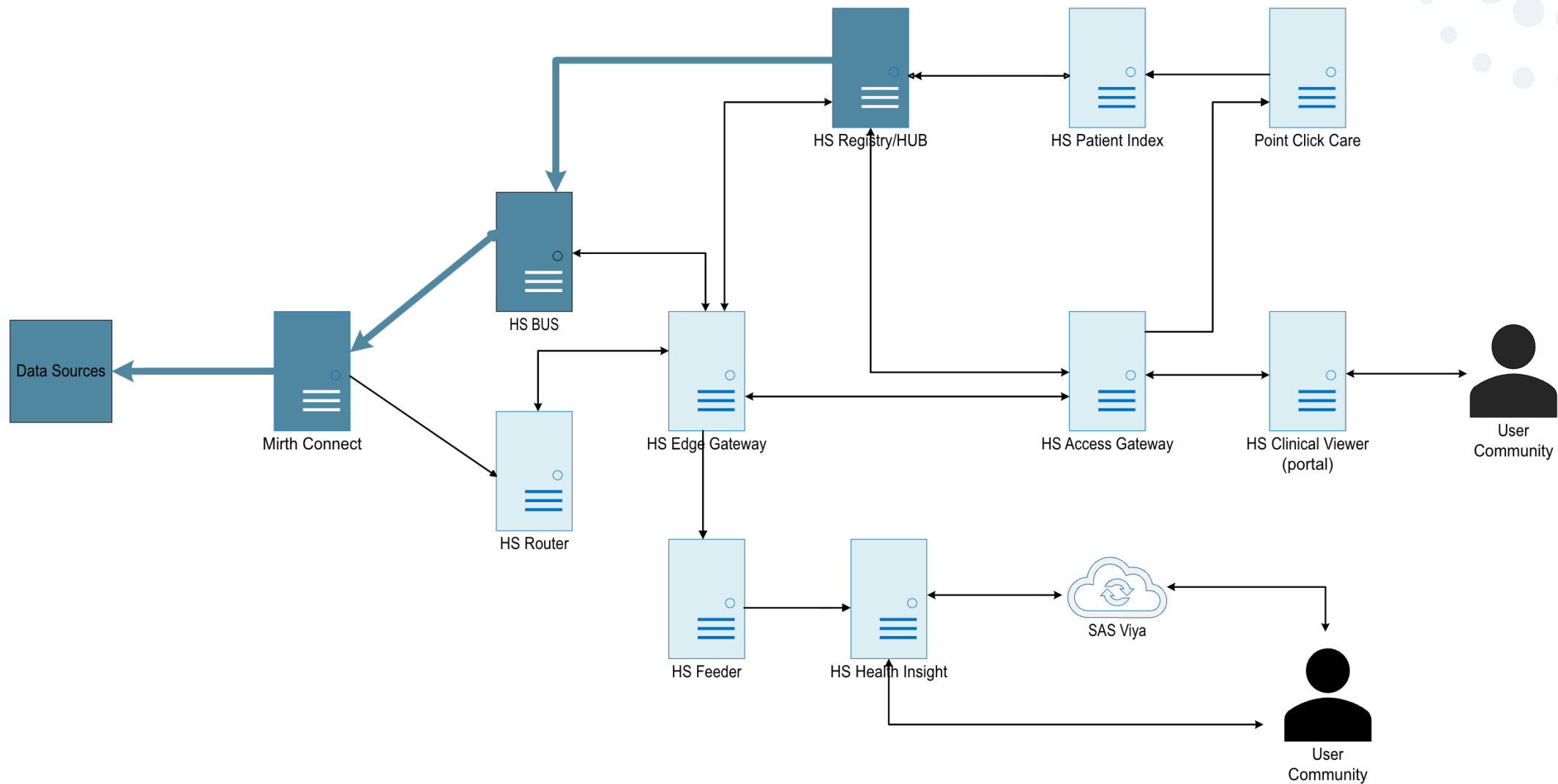
# Bi-directional



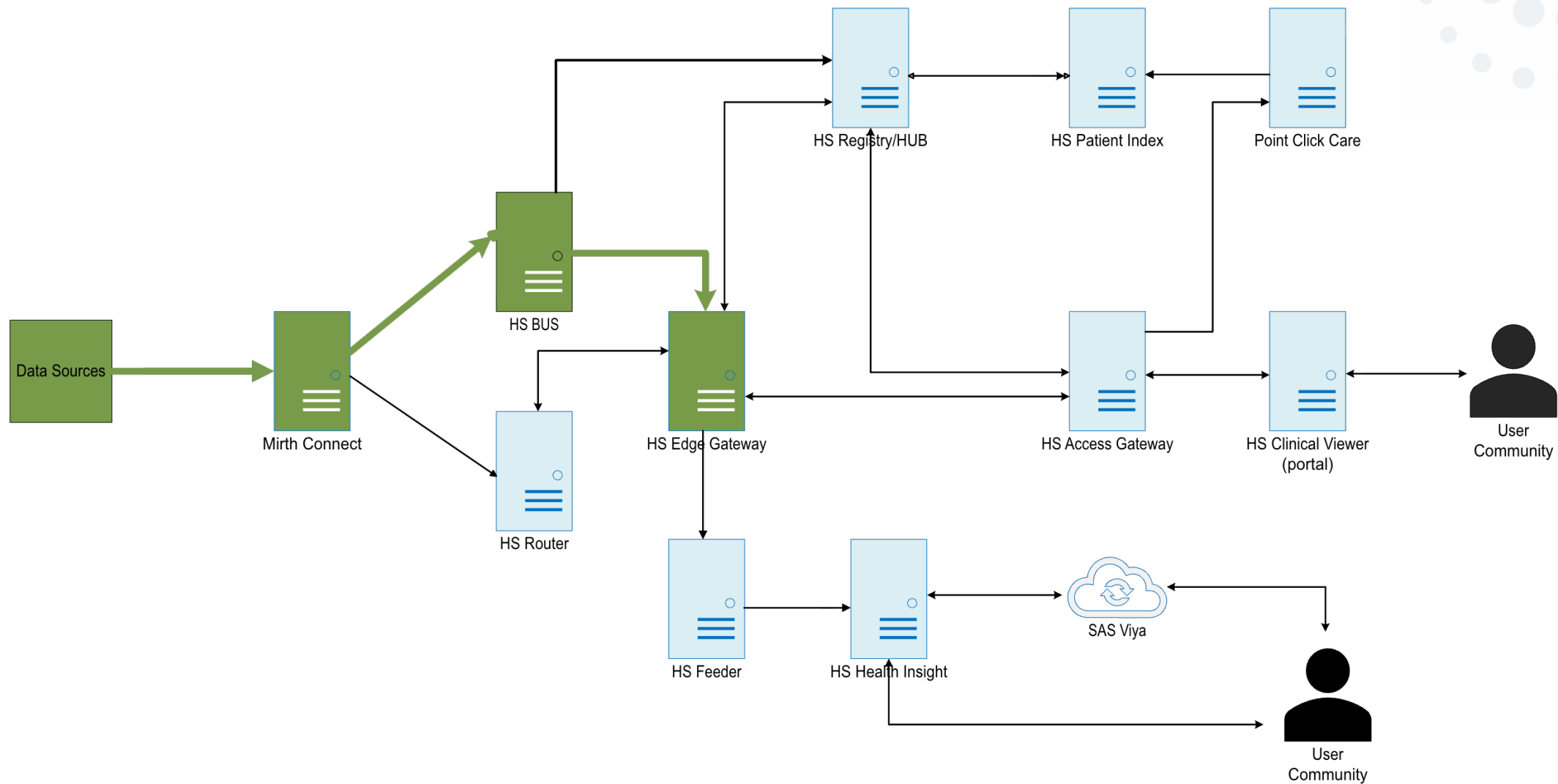
# Bi-directional



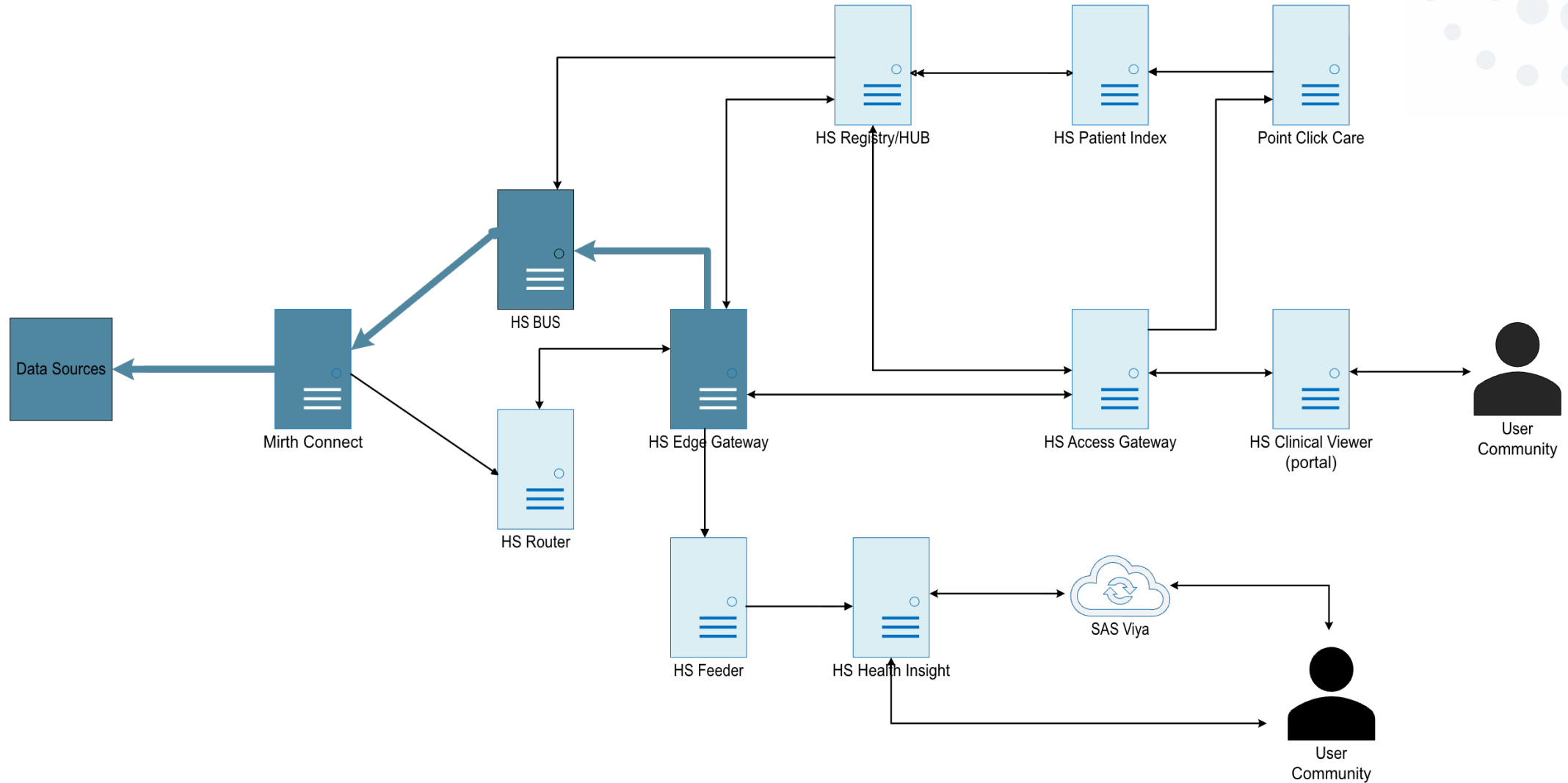
# Bi-directional



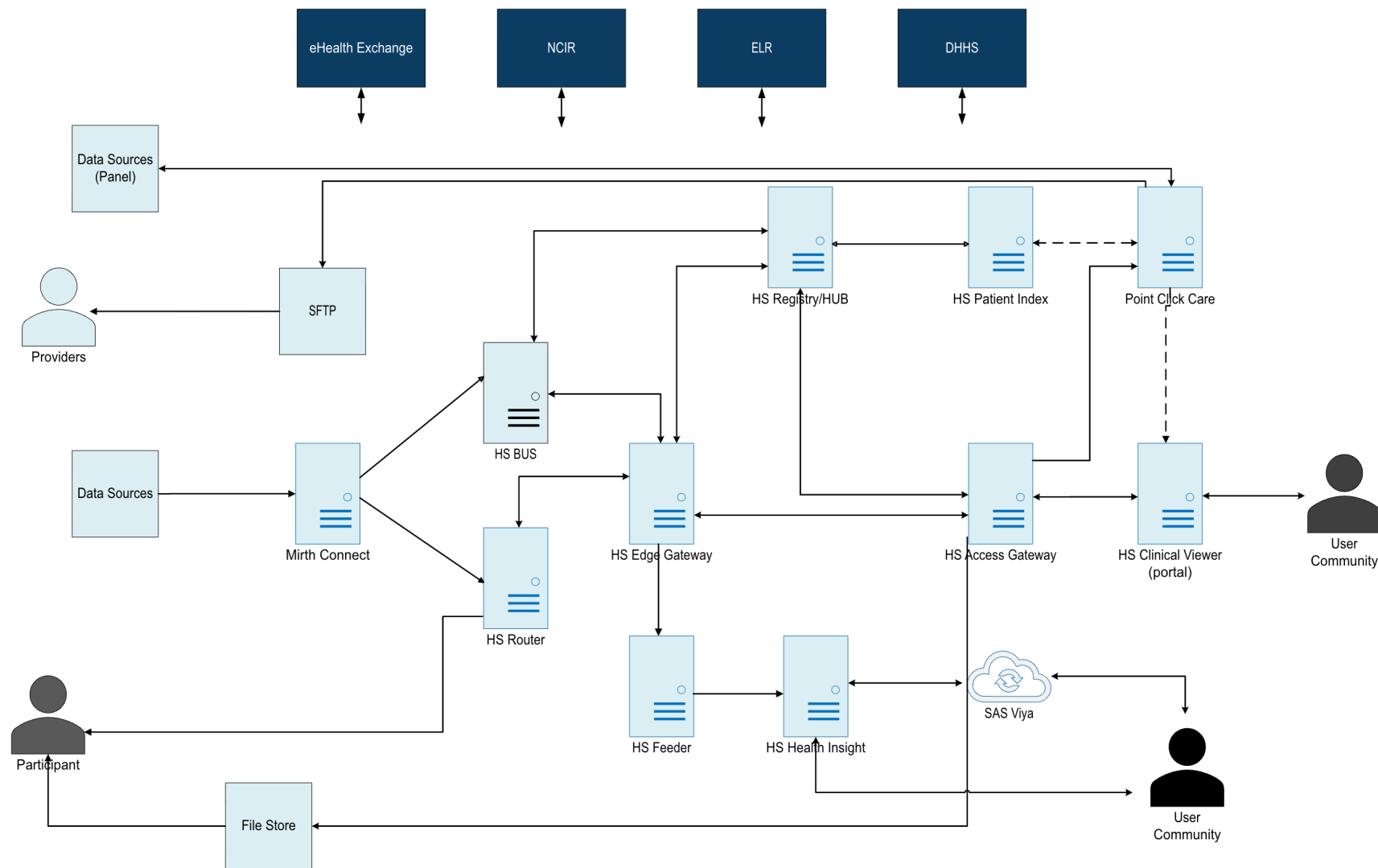
# Bi-directional



# Bi-directional



# Expanded HIEA Architecture



# Operations & Support



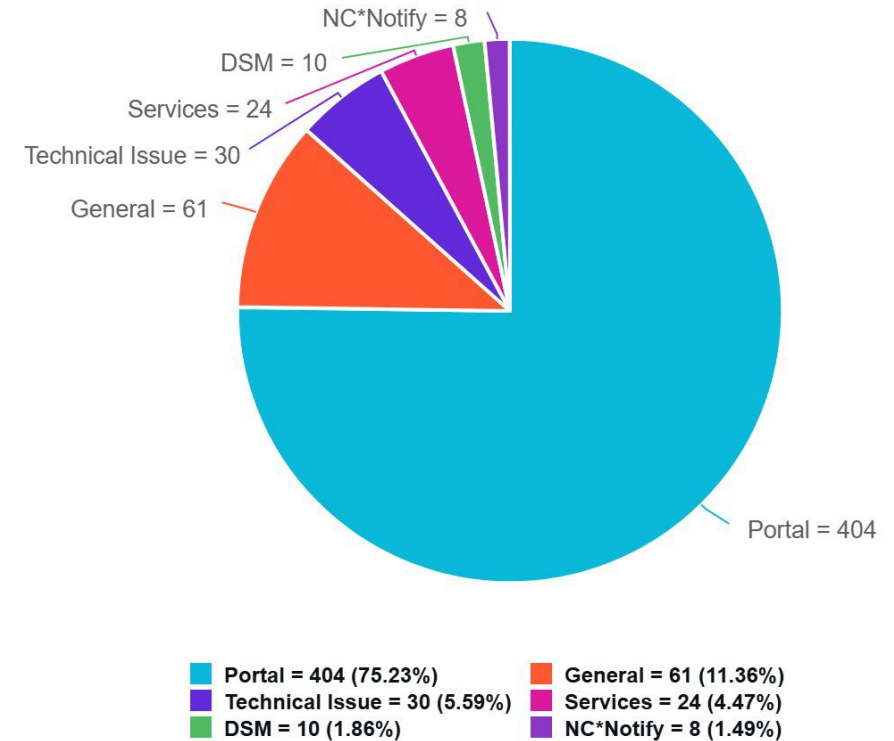
- Infrastructure:
  - Server and Network Infrastructure
  - On-going Capacity Assessments and Improvements
  - Operating System Updates
- Applications, Interfaces, & Solutions:
  - SAS & HealthShare Application Updates
  - Maintenance of Interfaces with EHRs & Other Data Contributors
  - Data to/from the NC\*Notify Plus Solution
- End-User Help Desk:
  - Provider Clinical Portal and NC\*Notify Plus Dashboard
  - Direct Secure Messaging
  - Patient Opt-Outs

# Help Desk

## Monthly Case Volume

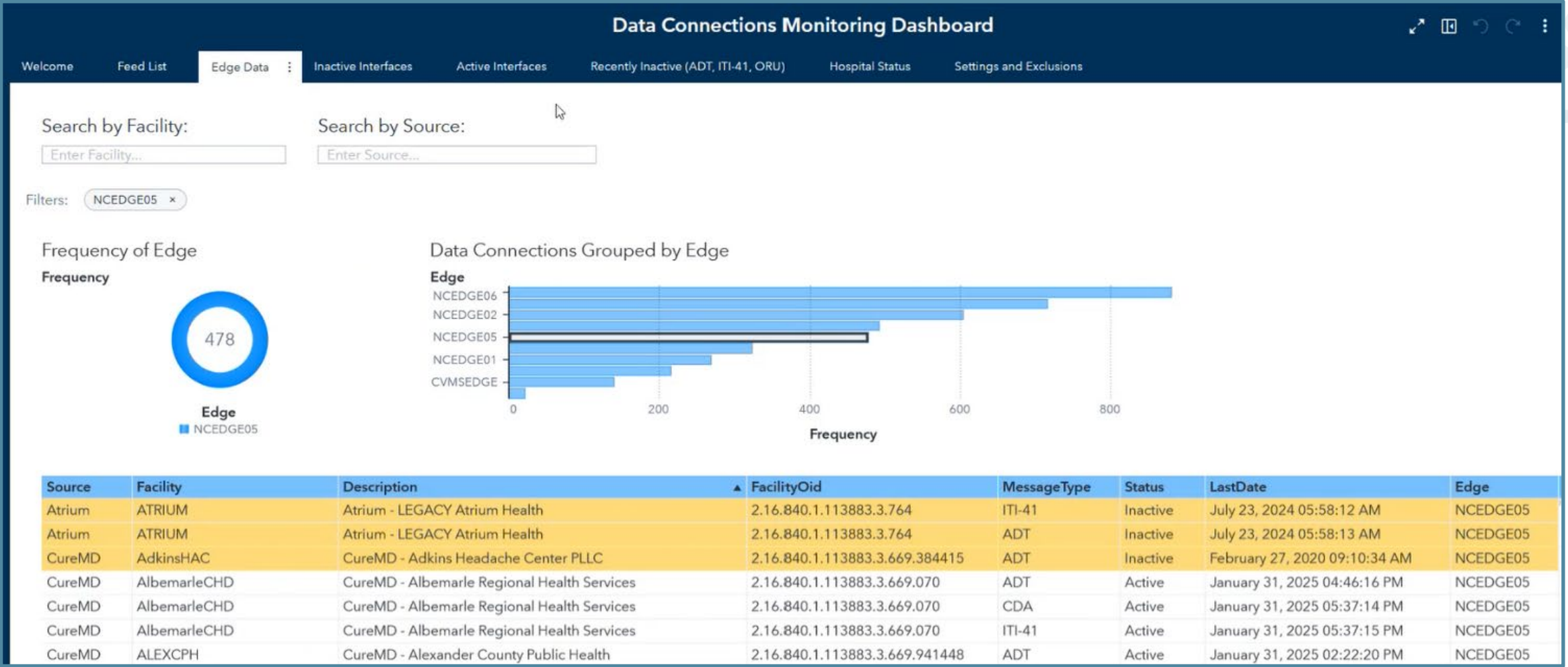


## Monthly Cases by Category





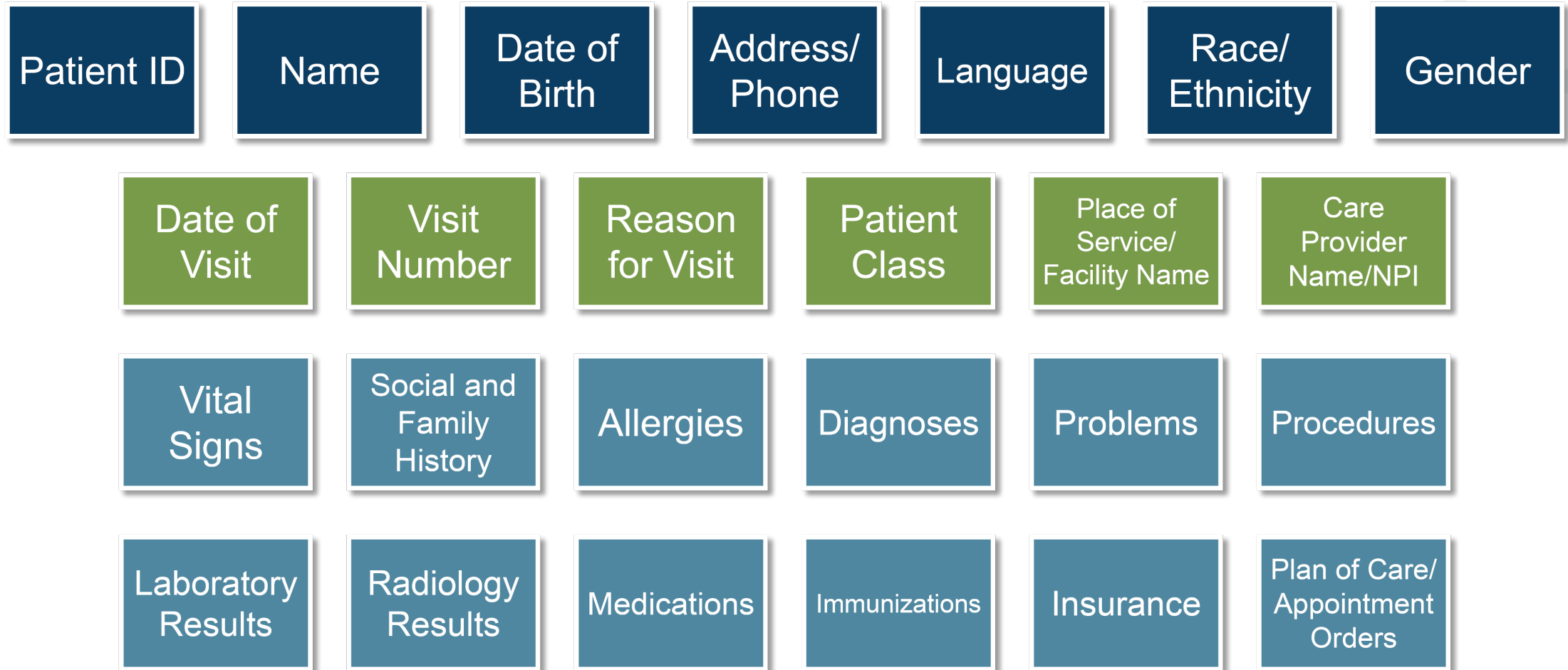
# Interface Monitoring Dashboard





# **NC HealthConnex's Identity Resolution Process**

# NC HealthConnex Data Targets



[NC HealthConnex Onboarding Packet and Technical Specifications](#)

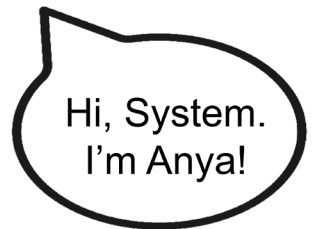
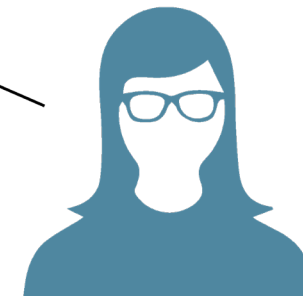
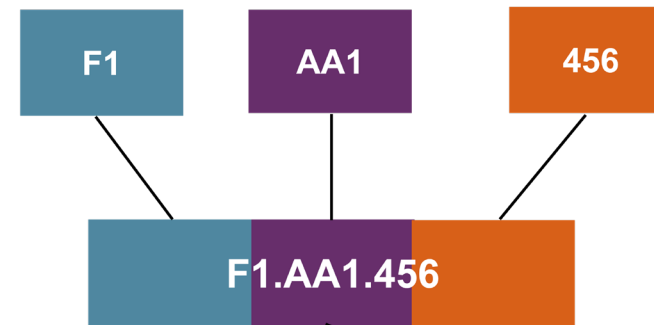
# NC HealthConnex Data Targets for BH Providers

Patient ID	Name	Date of Birth	Address/ Phone	Language	Race/ Ethnicity	Gender
Date of Visit	Visit Number	Reason for Visit	Patient Class	Place of Service/ Facility Name	Care Provider Name/NPI	
				Problems		
		Medications				

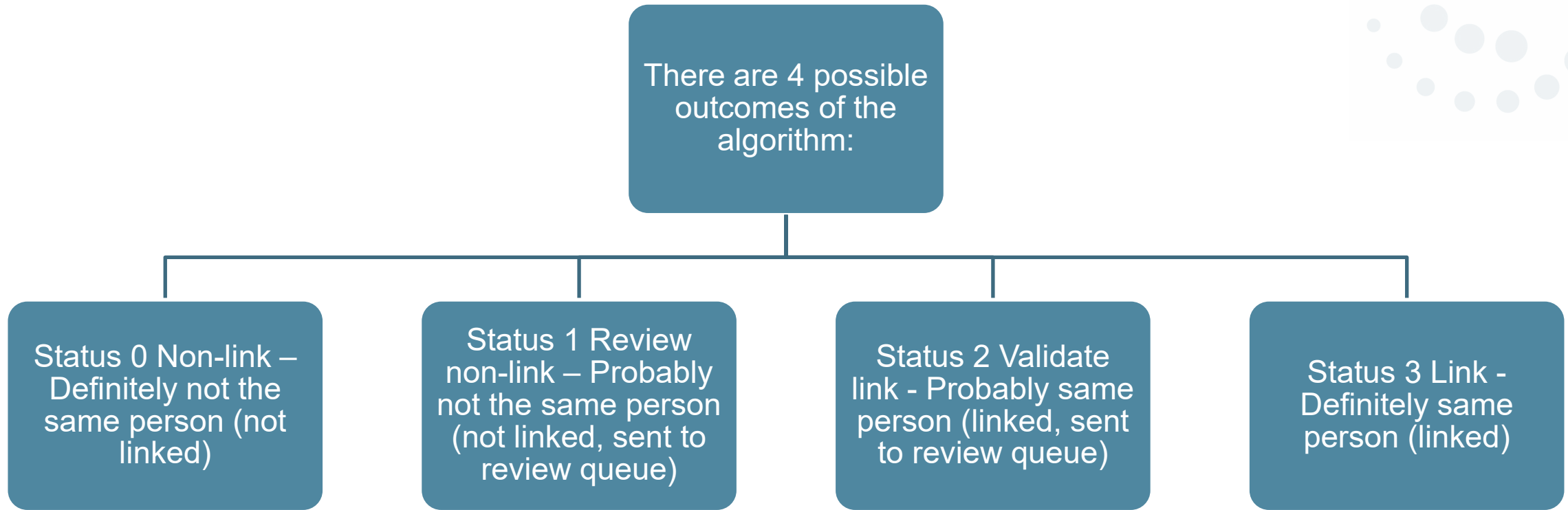
[NC HealthConnex Onboarding Packet and Technical Specifications](#)

# Patient Matching Methodology - Algorithm

- Patient demographics in HSPI (Health Share Patient Index) come from participating providers
- Pairs that have the same MRN from the same Assigning Authority and Facility are linked regardless of demographics (**Deterministic**)
- An internal algorithm compares data elements for patient pairs to determine if both records refer to the same patient (**Probabilistic**)
- The algorithm includes customized rules created by the NC HIEA and its technical partners
- Linked records are grouped under a single HIEA internal group called an MPI (Master Patient Index) number



# Patient Matching Methodology – Algorithm (continued)



Status 1 and 2 are added to the review queue for a human to make the final decision

# Deterministic Match



Scenario 1	Record A	Record B	Data Element Match?	Deterministic Match Outcome
	County Hospital A	County Hospital A	Yes	<ul style="list-style-type: none"> <li>Not a match</li> <li>MRN not the same</li> <li>Records will not deterministically link</li> </ul>
	Assigning Authority 1	Assigning Authority 1	Yes	
	MRN 1234	MRN 9876	No	



Scenario 2	Record A	Record B	Element Match?	Deterministic Match Outcome
	County Hospital B	County Hospital B	Yes	<ul style="list-style-type: none"> <li>Not a match</li> <li>Assigning Authority not the same</li> <li>Records will not deterministically link</li> </ul>
	Assigning Authority 1	Assigning Authority 2	No	
	MRN 1234	MRN 1234	Yes	



Scenario 3	Record A	Record B	Element Match?	Deterministic Match Outcome
	University Clinic A	University Clinic A	Yes	<ul style="list-style-type: none"> <li>Match</li> <li>All three elements match</li> <li>Records will be deterministically linked</li> </ul>
	Assigning Authority 1	Assigning Authority 1	Yes	
	MRN 6789	MRN 6789	Yes	

# Probabilistic Match

Data Element	Subfields	Agreement Weight	Disagreement Weight
Local Identifier	ID	<i>Deterministic Match</i>	
	Assigning Authority		
	Extension		
	Use		
Name	Family	14.000	-11.000
	Given		
	Middle		
	Prefix		
	Suffix		
	Type		
SSN	ID	13.152	-9.700
	Assigning Authority		
	Extension		
	Use		
Gender	None	2.100	-1.000
DOB	None	12.127	-9.000
Addresses	Unit Number	5.237	0.000
	Street		
	City		
	State		
	Zip Code		
	Country		
	Use		
Telecoms	Area Code	5.286	0.000
	Phone Number		
	URL		
	Email		
	Use		

Current Match (MPI Linkweight) Threshold: 34

## Additional considerations:

- Name matching uses known Soundex and Winkler similarity
- Common alias names (Bob = Robert)
- Name frequencies affect score ceilings (+14)
- SSN uses edit similarity (i.e., fat fingers)
- SSN matches against null/exclusions are not scored negatively
- DOB uses hamming similarity (“levels of different”)
- Normalized values used for scoring
  - Exclusion lists ("Unknown" = null)
- Customized rules integrated into scoring, such as:
  - Marriage rule: Adults with different Last Name, other demographics match
  - Jr/Sr rule: Different DOB, other demographics match
  - Twin rule: Different First Name, other demographics match



# Manual Review

## No records are modified/updated by NC HIEA staff

- Record pairs for manual review are listed in the review queue
- Manual review includes use of resources like:
  - History of current records (e.g., previous address)
  - Free publicly available data websites
  - Medical records (especially for minors)
  - NC eLink
  - Provider outreach (e.g., one MRN has conflicting demographics)



# Data Quality Challenges

- Missing/incomplete data from data sources
- One MRN assigned to multiple patients
- Clinical workflow issue
- NC\*Notify panel MRN pool different from Provider MRN pool
- EHR configuration issue
- Inaccurate or unstructured data
- Unexpected source system changes, such as EHR upgrades or migrations
- Changes in Healthcare IT/interoperability standards, such as changes in HL7 standards or the progression from USCDI v1 to USCDI v2, v3 and beyond

# Potential Impacts

Unrelated records matched (records from multiple patients joined)

## HIGH SEVERITY

- Inadequate patient care
- Incorrect diagnoses
- Labs results attributed to wrong patient
- NC\*Notify alerts for wrong patient

Related records separated in multiple MPI (incomplete patient record) –

Missing history and/or test results

Unnecessary repetition of tests/procedures

Missed NC\*Notify alerts



# **Analytics and External Services Showcase**

# Analytics and External Services Showcase

## Stakeholder Partnerships

- NC Medicaid
- Division of Public Health
- Division of Mental Health
- Department of Adult Corrections
- Enterprise Data Office Projects
  - NC eLink
  - NC Center for Geographic Information and Analysis Maps

## Use Case Workgroup

- Colorectal Cancer Screening Support
- Lincoln Project
- Stroke Registry
- ACURE4Moms
- Future Projects

# Analytics and External Services Showcase

- **Stroke Registry**
- **NC DETECT**
- **System Health Check**
- **NC HealthConnex Coverage & Civitas Maps**
- **Data Traceability Report**



# Stroke Registry

# Stroke Registry

The purpose of developing this dashboard was to have an analytical tool to provide essential information on stroke epidemiology, management and outcomes.

This collaboration was between the NCDHHS Division of Public Health project team working with the Stroke Prevention Taskforce and the NC HIEA.

The dashboard looks at the following areas of focus:

- Total Stroke Volume by Patient Address
- Stroke Prevalence by Patient Address
- Encounters by Organization
- Trends (in stroke patients by Age, Race, and Gender)
- Risk factors
- Health Indicators

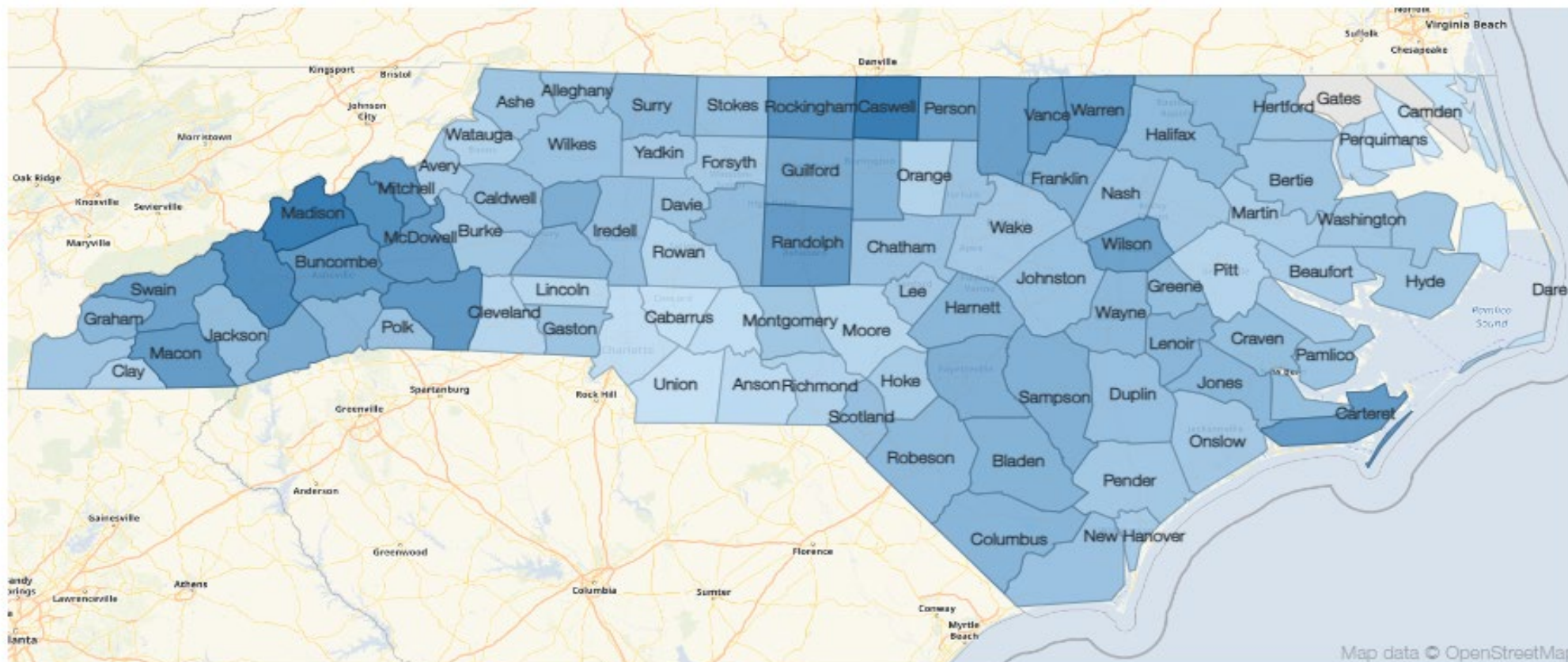


# Stroke Registry

## Stroke Prevalence by County

< Stroke Prevalence by County Stroke Prevalence by Zip Code >

**Stroke Prevalence by County** \*If a county is selected via the map below, the pop-up datatip window will not update for any filters applied afterwards, please de-select the county before applying additional filters.



Data represented here is for demonstration purposes only

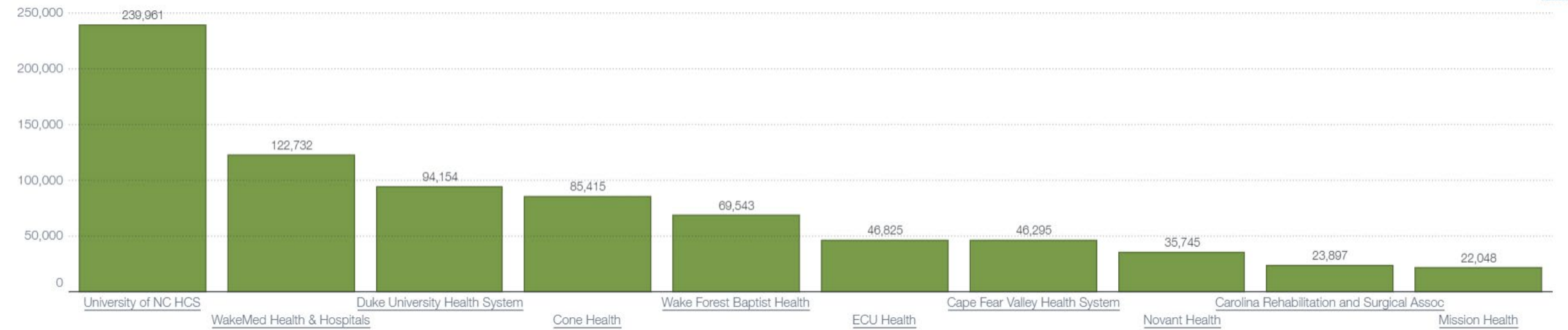
# Stroke Registry

## Encounters by Organization

StrokeRegistry

Filters: Jan2019; Dec2025 > NC > Jan2019; Nov2025

**Encounters by Organization** \*All encounters for patients with a stroke diagnosis are displayed on this tab. Encounters may or may not relate directly to stroke care.

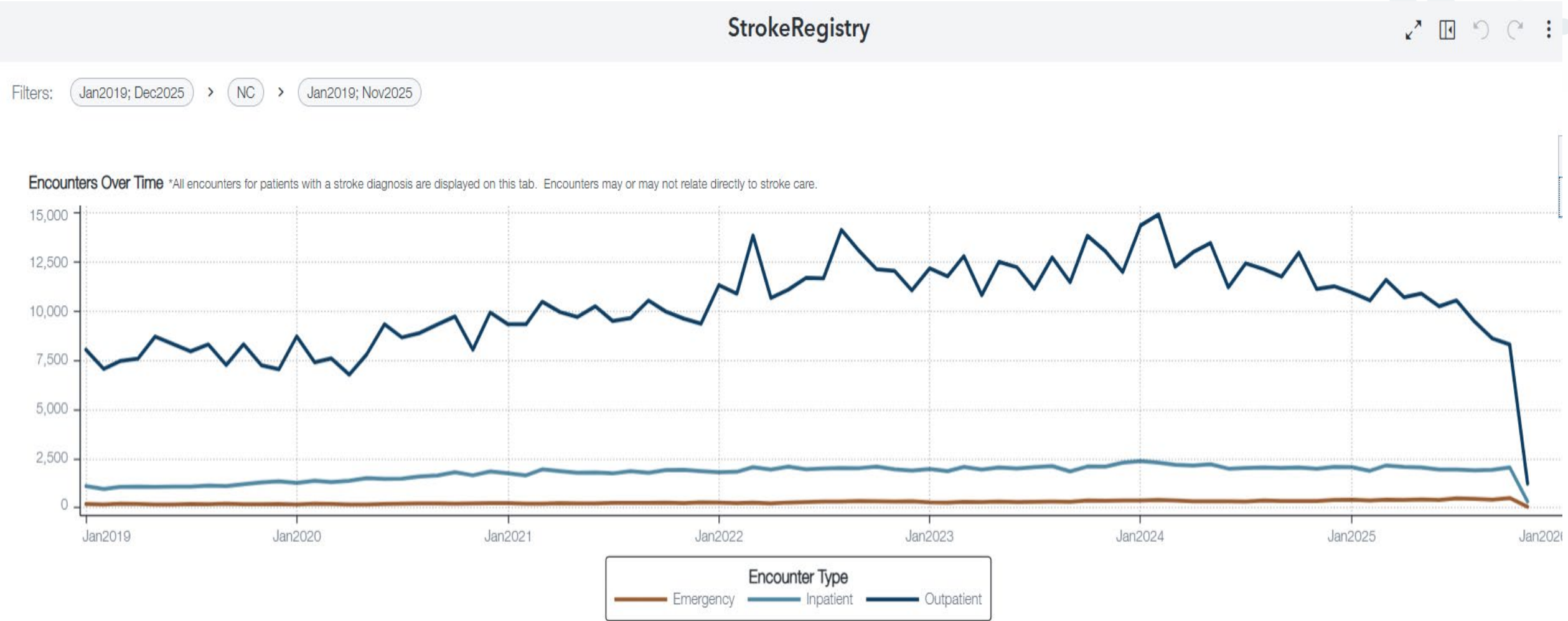


FacilityName	Number of Encounters
University of NC HCS	239,961
WakeMed Health & Hospitals	122,732
Duke University Health System	94,154
Cone Health	85,415

Data represented here is for demonstration purposes only

# Stroke Registry

## Stroke Encounters Over Time



Data represented here is for demonstration purposes only

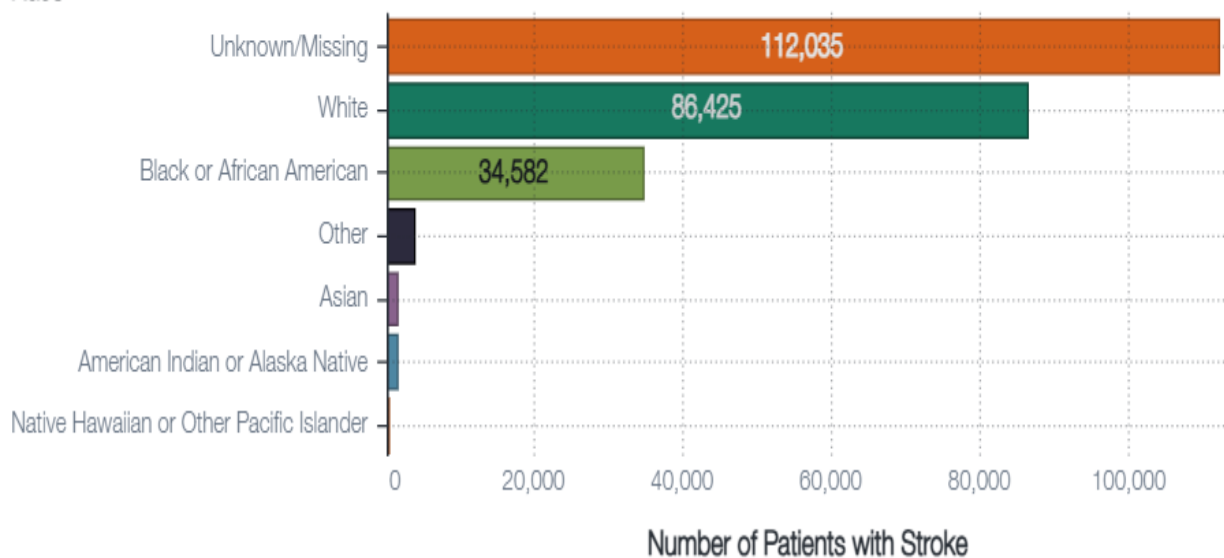
# Stroke Registry

## Trends in Stroke cases by Race, Age and Gender

< Race Age Gender >

Number of Patients with Stroke by Race

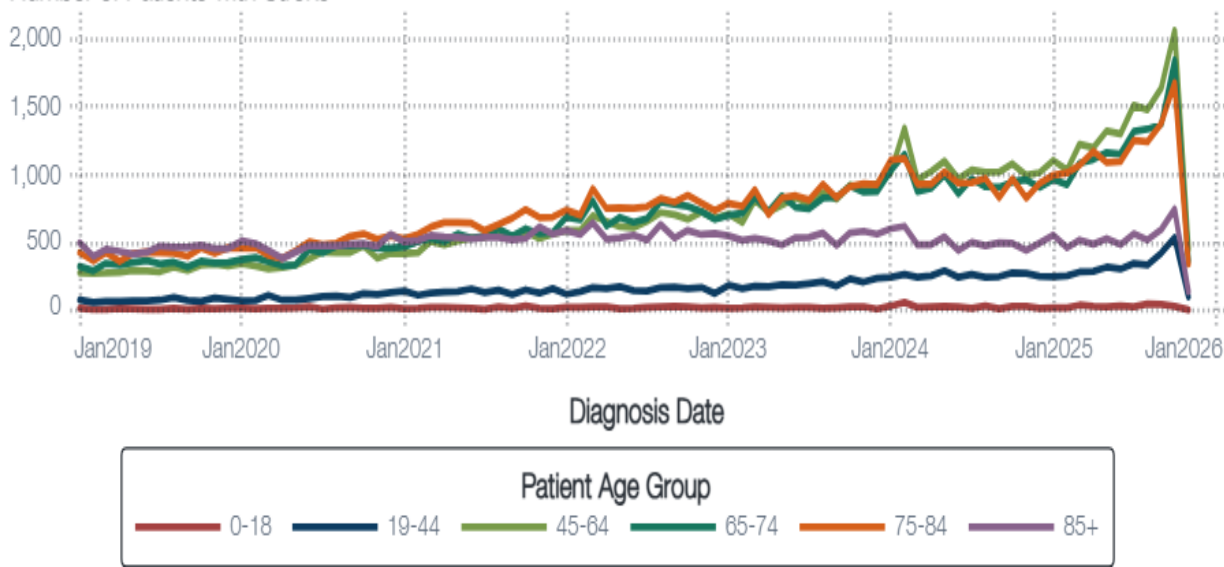
Race



< Diagnosis Date - Race Diagnosis Date - Age Diagnosis Date - Gender >

Diagnosis Date Grouped by Age

Number of Patients with Stroke



Data represented here is for demonstration purposes only



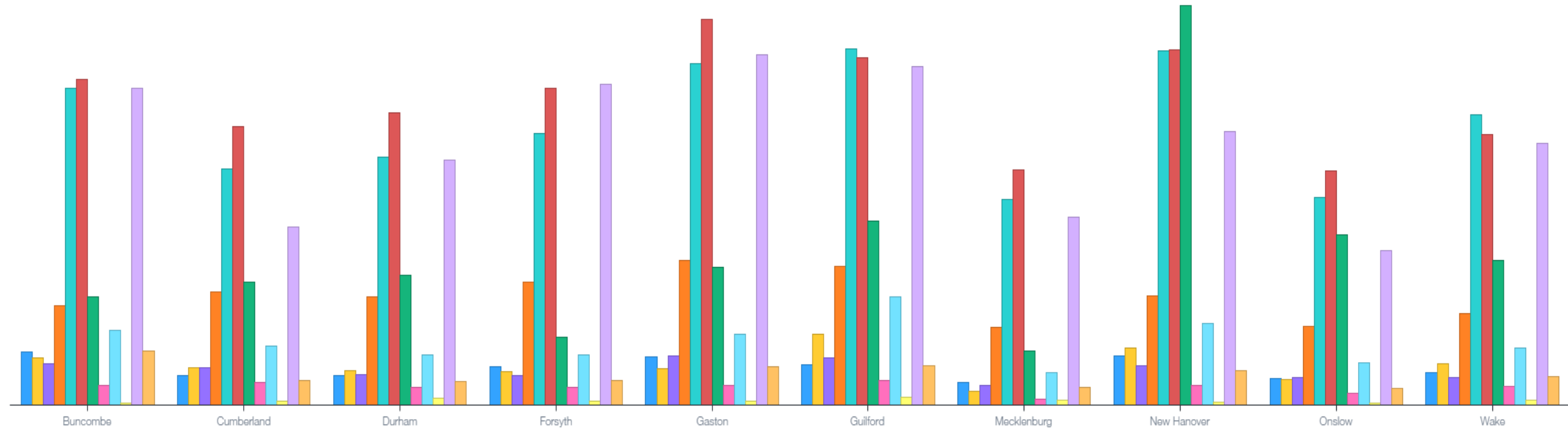
# Stroke Registry

## Risk Factors Rates by County



County Risk Rates (per 1,000 patients in HIE)

aFib County Rate CAD County Rate CHF County Rate Diabetes County Rate HLD County Rate Hypertension County Rate Obesity County Rate Prior Stroke County Rate PVD County Rate Sickle Cell County Rate Tobacco Use County Rate VD County Rate



Data represented here is for demonstration purposes only

# Stroke Registry

## Health Indicators Tab



Page Level Filters

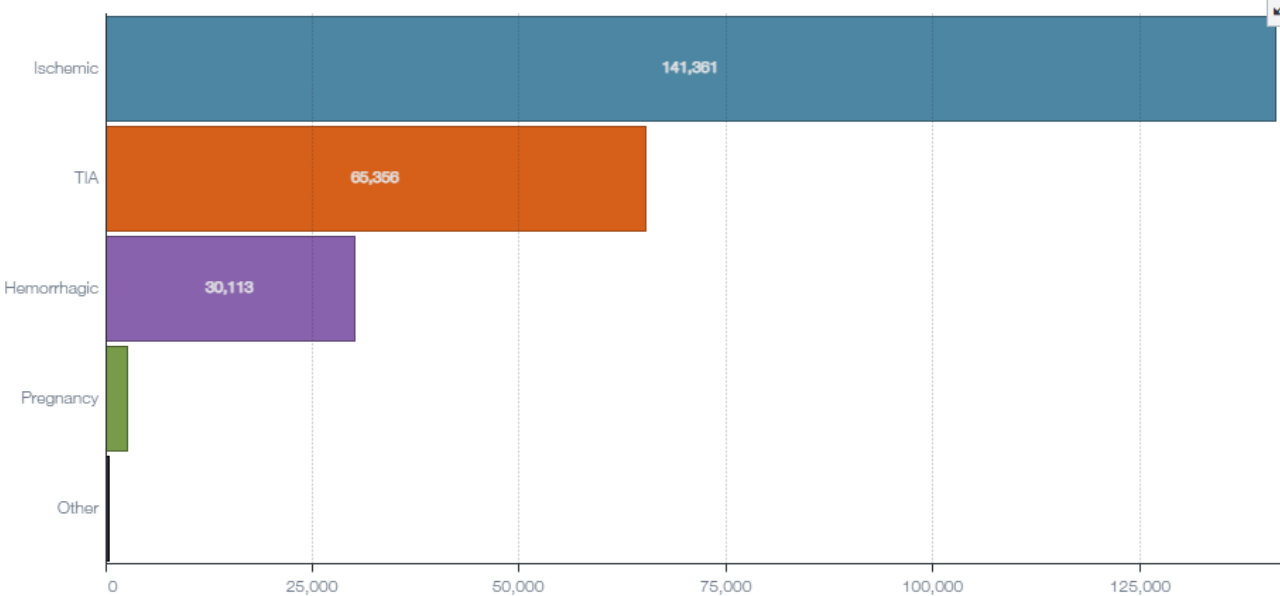
Stroke Type ▾

Demographic ▾

Geographic ▾

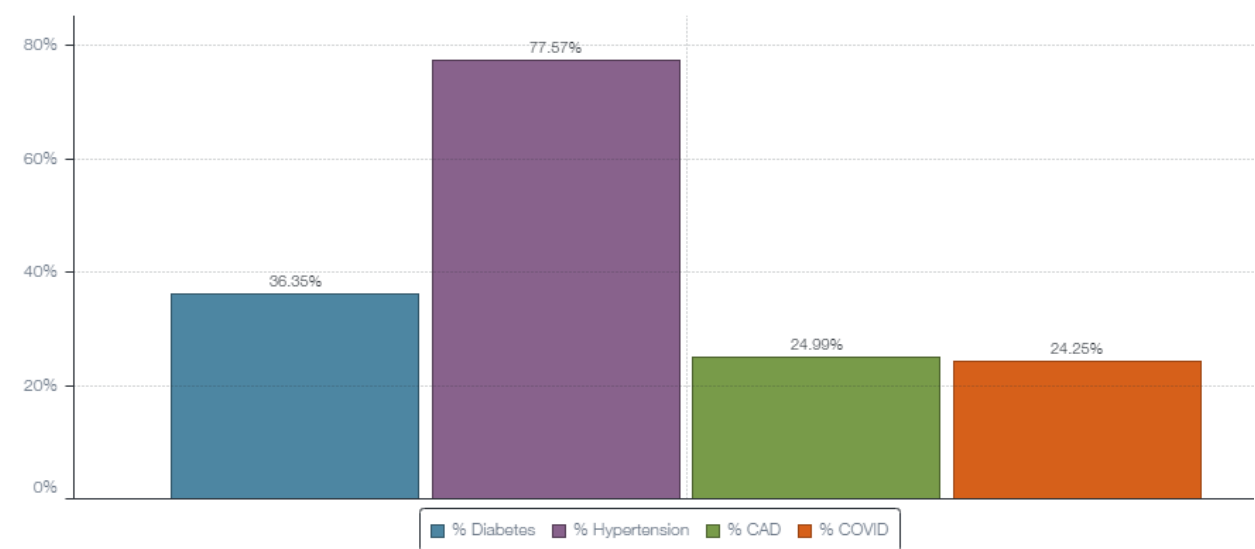
Diagnosis Date ▾

Types of Stroke



< Comorbidities BMI LDL Blood Pressure COVID >

Comorbidities



Data represented here is for demonstration purposes only



# NC DETECT

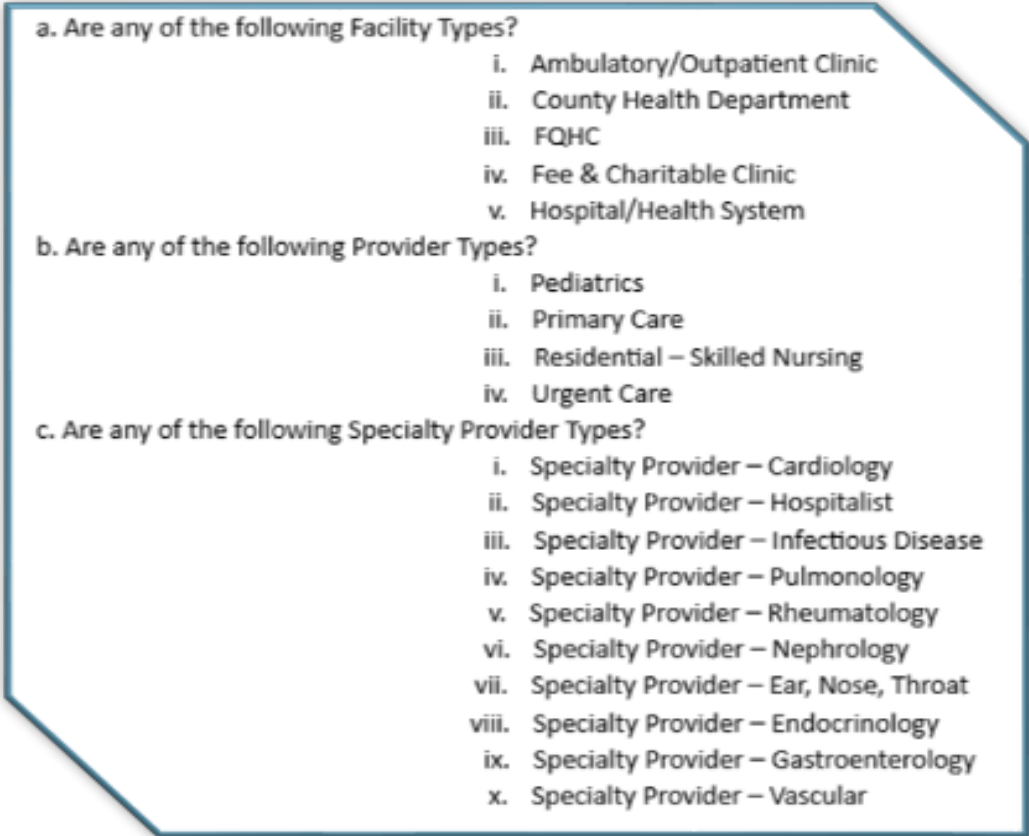
*North Carolina Disease Event Tracking and  
Epidemiologic Collection Tool*

# NC DETECT

- NCDHHS Division of Public Health (DPH) and NC HIEA collaboration; during COVID-19 response, public health needed on-time outpatient visit data for surveillance.
- NC HIEA data is shared with DPH through daily file transfers.
- The data is used for surveillance in outpatient clinics for reportable communicable diseases.

To the right is the list of facilities and providers that are included in the data sharing.

Participating sites have a check box in JIRA if their data is included and documented in Salesforce on the NC HIEA side.

- 
- a. Are any of the following Facility Types?
- i. Ambulatory/Outpatient Clinic
  - ii. County Health Department
  - iii. FQHC
  - iv. Fee & Charitable Clinic
  - v. Hospital/Health System
- b. Are any of the following Provider Types?
- i. Pediatrics
  - ii. Primary Care
  - iii. Residential – Skilled Nursing
  - iv. Urgent Care
- c. Are any of the following Specialty Provider Types?
- i. Specialty Provider – Cardiology
  - ii. Specialty Provider – Hospitalist
  - iii. Specialty Provider – Infectious Disease
  - iv. Specialty Provider – Pulmonology
  - v. Specialty Provider – Rheumatology
  - vi. Specialty Provider – Nephrology
  - vii. Specialty Provider – Ear, Nose, Throat
  - viii. Specialty Provider – Endocrinology
  - ix. Specialty Provider – Gastroenterology
  - x. Specialty Provider – Vascular

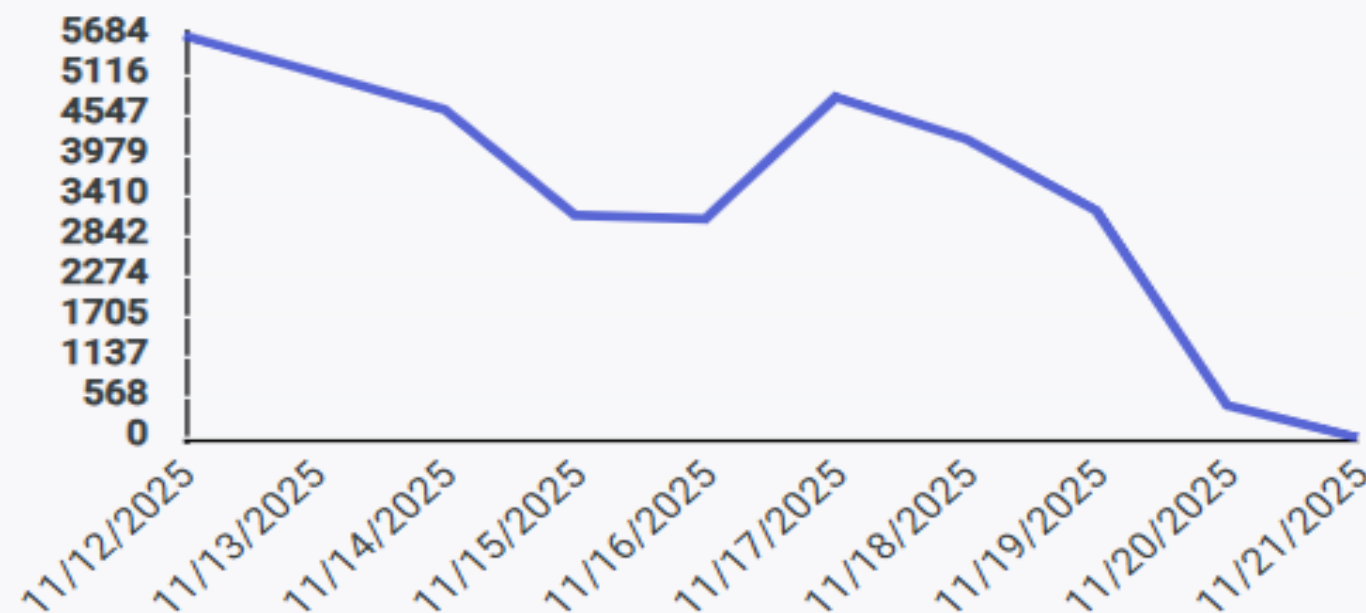




Inpatient encounters data sent by the NC HIEA to NC DETECT in daily flat file transfers.

## Count of All HIE Inpatient Encounters

Source: NC DETECT; Generated: 11/21/2025



Data represented here is for demonstration purposes only

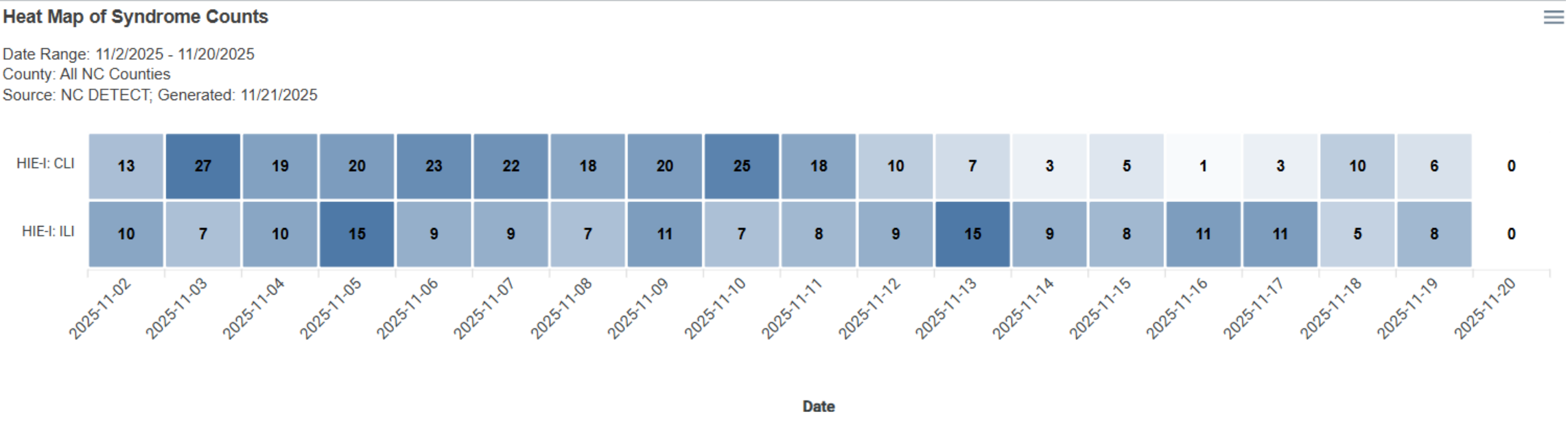
# NC DETECT

Heat map using HIE outpatient data to show Covid-like illness and flu-like Illness from November 2025

## Heat Maps

Search Criteria:

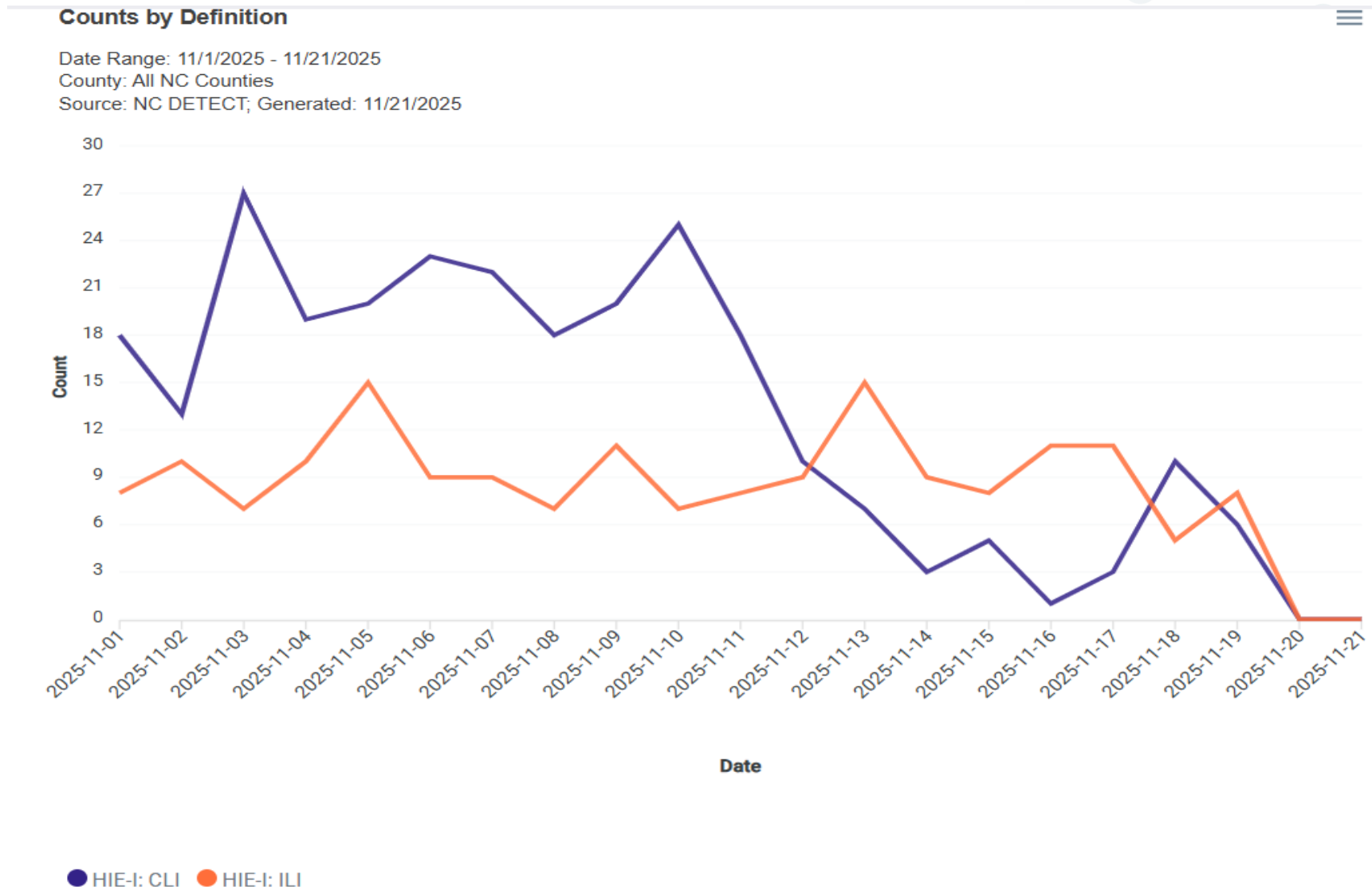
- Definition: HIE-I: ILI, HIE-I: CLI
- Date Range: 11/2/2025 - 11/20/2025
- County: All NC Counties



Data represented here is for demonstration purposes only

# NC DETECT

Count of Covid-like illness and flu-like illness from November 2025 using NC HIEA data to show trend by week



Data represented here is for demonstration purposes only



# System Health Check Demo

*Understanding HealthShare Health Insight (HSHI) Data*

# NC HIEA Analytics Is Expanding Access To & Use Of HSHI Data

- Expanding access to and the use of HSHI data in support of NC HIEA analytics initiatives
- Taking a conservative approach to HSHI data usage for new and complex queries
- Working to increase detailed understanding of all data available
- Building & improving the System Health Check Dashboard for fast access to available HSHI metadata



# HSHI Production Job Schedule



Production Process	Frequency	Start Time	Runtime	Resource Demand
Continuous Monitoring Daily ETL	Daily	3:35 PM	~30 minutes	Low
Sickle Cell Extract	Mon, Wed, Fri	10:00 AM	~1 hour	Low
DQ Dashboard	Sundays	5:00 PM	~20 hours	Low
Diabetes Registry Sked	First Friday of each month	5:00 PM	~48 hours	High
Stroke Registry ETL	9 <sup>th</sup> of each month	4:30 PM	~8 days	High
3 <sup>rd</sup> Weekend Maintenance	Every third Sat/Sun	7:00 AM	~34 hours	Blackout

- We aim to be good HSHI citizens
- We schedule analytics queries based on availability

# HSHI Table Report

Connection Name

< HSAA\_PRD (34.82%) HSAA\_STG (34.08%) HSRG\_PRD (3.10%) >

< BASE T... >

HSAA (2.79%)

TABLE\_NAME

Table Type

Table Schema

Table Name

Table Row Count

0 to 3,064,384,041

03,064,384,041

Search Class & Desc

Enter DESCRIPTION...

INVISIBLE_IN_VIYA	CONNECTION_NAME	TABLE_SCHEMA	TABLE_NAME	TABLE_ROW_COUNT	TABLE_TYPE	CLASSNAME	DESCRIPTION
	HSAA_PRD	HSAA	EOBSUPPORTINGINFO	13,053,934	BASE TABLE	HSAA.EOBSUPPORTINGINFO	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ENTEREDAT	301,220	BASE TABLE	HSAA.ENTEREDAT	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ENROLLMENTHEALTHPLAN	4,803,404	BASE TABLE	HSAA.ENROLLMENTHEALTHPLAN	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ENCOUNTERPARTICIPANT	135,370,797	BASE TABLE	HSAA.ENCOUNTERPARTICIPANT	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ENCOUNTERHEALTHPLAN	491,922,961	BASE TABLE	HSAA.ENCOUNTERHEALTHPLAN	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ENCOUNTERGUARANTOR	0	BASE TABLE	HSAA.ENCOUNTERGUARANTOR	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ENCOUNTER	762,313,234	BASE TABLE	HSAA.ENCOUNTER	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	DOCUMENT	722,554,760	BASE TABLE	HSAA.DOCUMENT	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	DIAGNOSIS	1,383,364,470	BASE TABLE	HSAA.DIAGNOSIS	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	DEVICEITEM	0	BASE TABLE	HSAA.DEVICEITEM	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	DEVICE	0	BASE TABLE	HSAA.DEVICE	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	CLINICALRELATIONSHIP	99	BASE TABLE	HSAA.CLINICALRELATIONSHIP	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	CHANGEDOBJECTS	7,157,473	BASE TABLE	HSAA.CHANGEDOBJECTS	THIS CLASS IS USED INTERNALLY BY HSAA. YO
	HSAA_PRD	HSAA	CAREPROVIDERSITE	56,055,068	BASE TABLE	HSAA.CAREPROVIDERSITE	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	CAREPROVIDER	42,037,967	BASE TABLE	HSAA.CAREPROVIDER	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	CAREPLANHEALTHCONCERN	0	BASE TABLE	HSAA.CAREPLANHEALTHCONCERN	
	HSAA_PRD	HSAA	CAREPLANGOAL	0	BASE TABLE	HSAA.CAREPLANGOAL	
	HSAA_PRD	HSAA	CAREPLAN	0	BASE TABLE	HSAA.CAREPLAN	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	CALCULATIONCODE	599	BASE TABLE	HSAA.CALCULATIONCODE	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	BILLINGPROCESSNOTE	0	BASE TABLE	HSAA.BILLINGPROCESSNOTE	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	APPOINTMENT	106,980,240	BASE TABLE	HSAA.APPOINTMENT	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ALLERGY	41,777,472	BASE TABLE	HSAA.ALLERGY	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	ADVANCEDIRECTIVE	356	BASE TABLE	HSAA.ADVANCEDIRECTIVE	DO NOT EDIT - YOU SHOULD NOT DIRECTLY AL
	HSAA_PRD	HSAA	AC4MPATIENTPANEL	47,749	VIEW	HSAA.AC4MPATIENTPANEL	
	HSAA_PRD	HSAA	AC4MALERTTRACKER	73,606	VIEW	HSAA.AC4MALERTTRACKER	

- Working to understand table sizes
- Differentiating between tables and complex views
- Using the table descriptions to understand purpose
- Performing free form text searches when looking to identify tables



# HSHI Column Report

Primary Key

NO (99.66%) YES (0.34%)

Indexed Variable

NO (95.69%) YES (4.31%)

Column Type

DATA\_TYPE ▾

Variable Length

0 to 2147483647

0 2147483647

Search Column Name & Desc

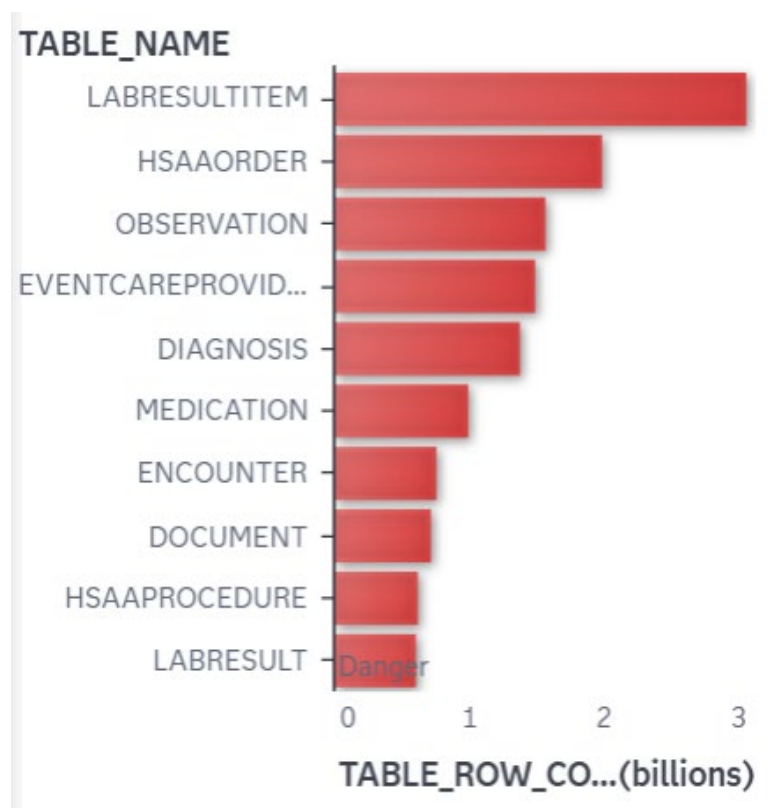
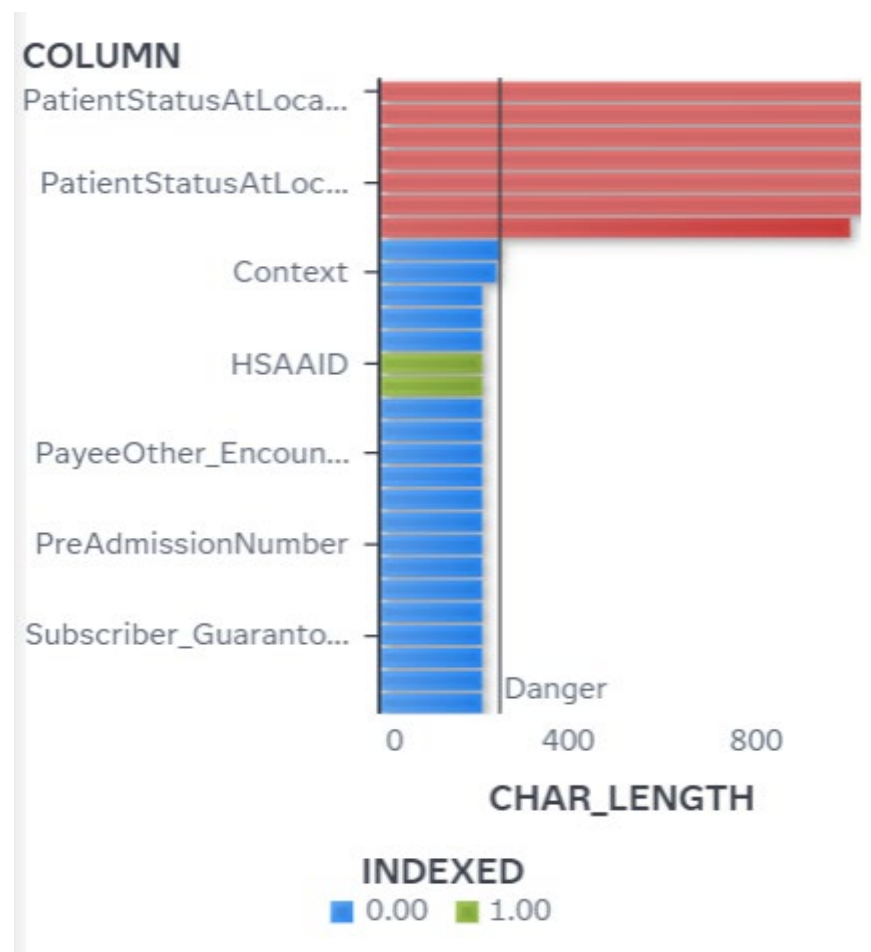
Enter COLUMN...

TABLE_SCHEMA	TABLE_NAME	COLUMN	SAS_COLUMN_NAME	DATA_TYPE	CHAR_LENGTH	SAS_RECOMMENDED_CHAR_LENGTH	NUMERIC_PRECISION	PRIMARY_KEY	INDEX_COLUMN
HSAA	HEALTHCAREFACILITY	Address_State_Description	ADDRESS_STATE_DESCRIPTION	CHARACTER	32000	512	.	NO	NO
HSAA	ENTEREDAT	Address_State_Description	ADDRESS_STATE_DESCRIPTION	CHARACTER	32000	512	.	NO	NO
HSAA	HEALTHCAREFACILITY	Address_State_Extension	ADDRESS_STATE_EXTENSION	CHARACTER	0	10	.	NO	NO
HSAA	PATIENT	Address_State_Extension	ADDRESS_STATE_EXTENSION	CHARACTER	0	10	.	NO	NO
HSAA	CAREPROVIDER	Address_State_Extension	ADDRESS_STATE_EXTENSION	CHARACTER	0	10	.	NO	NO
HSAA	ENTEREDAT	Address_State_Extension	ADDRESS_STATE_EXTENSION	CHARACTER	0	10	.	NO	NO
HSAA	CAREPROVIDERSITE	Address_State_Extension	ADDRESS_STATE_EXTENSION	CHARACTER	0	10	.	NO	NO
HSAA	GUARANTOR	Address_State_Extension	ADDRESS_STATE_EXTENSION	CHARACTER	0	10	.	NO	NO
HSAA	ENCOUNTERGUARANTOR	Address_State_Extension	ADDRESS_STATE_EXTENSION	CHARACTER	0	10	.	NO	NO
HSAA	ENTEREDAT	Address_State_SDACodingStandard	ADDRESS_STATE_SDACODINGSTANDARD	CHARACTER	32000	512	.	NO	NO
HSAA	HEALTHCAREFACILITY	Address_State_SDACodingStandard	ADDRESS_STATE_SDACODINGSTANDARD	CHARACTER	32000	512	.	NO	NO
HSAA	CAREPROVIDER	Address_State_SDACodingStandard	ADDRESS_STATE_SDACODINGSTANDARD	CHARACTER	32000	512	.	NO	NO
HSAA	ENCOUNTERGUARANTOR	Address_State_SDACodingStandard	ADDRESS_STATE_SDACODINGSTANDARD	CHARACTER	32000	512	.	NO	NO
HSAA	PATIENT	Address_State_SDACodingStandard	ADDRESS_STATE_SDACODINGSTANDARD	CHARACTER	32000	512	.	NO	NO
HSAA	GUARANTOR	Address_State_SDACodingStandard	ADDRESS_STATE_SDACODINGSTANDARD	CHARACTER	32000	512	.	NO	NO
HSAA	CAREPROVIDERSITE	Address_State_SDACodingStandard	ADDRESS_STATE_SDACODINGSTANDARD	CHARACTER	32000	512	.	NO	NO
HSAA	PATIENT	Address_Street	ADDRESS_STREET	CHARACTER	220	220	.	NO	NO
HSAA	ENCOUNTERGUARANTOR	Address_Street	ADDRESS_STREET	CHARACTER	220	220	.	NO	NO
HSAA	ENTEREDAT	Address_Street	ADDRESS_STREET	CHARACTER	220	220	.	NO	NO
HSAA	CAREPROVIDERSITE	Address_Street	ADDRESS_STREET	CHARACTER	220	220	.	NO	NO
HSAA	HEALTHCAREFACILITY	Address_Street	ADDRESS_STREET	CHARACTER	220	220	.	NO	NO
HSAA	CAREPROVIDER	Address_Street	ADDRESS_STREET	CHARACTER	220	220	.	NO	NO
HSAA	GUARANTOR	Address_Street	ADDRESS_STREET	CHARACTER	220	220	.	NO	NO

- Working to understand column lengths
- Differentiating between character & numeric columns
- Using the column descriptions to understand purpose
- Performing free form text searches when looking for columns



# HSHI Table & Column Caution Report



- Identifying when a table has a very high row count
- When a column has a very long defined length
- Bring attention to table & columns where caution should be applied

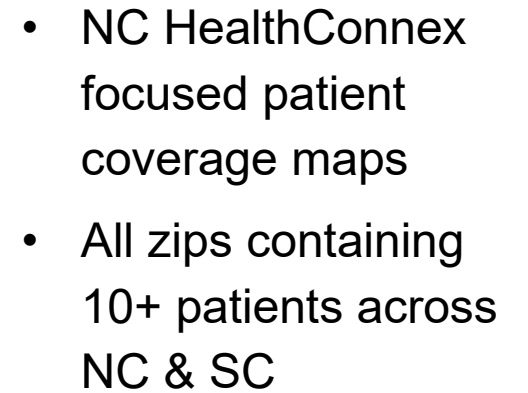


# NC HealthConnex Coverage & Civitas Maps

*U.S. Patient Coverage Mapping*

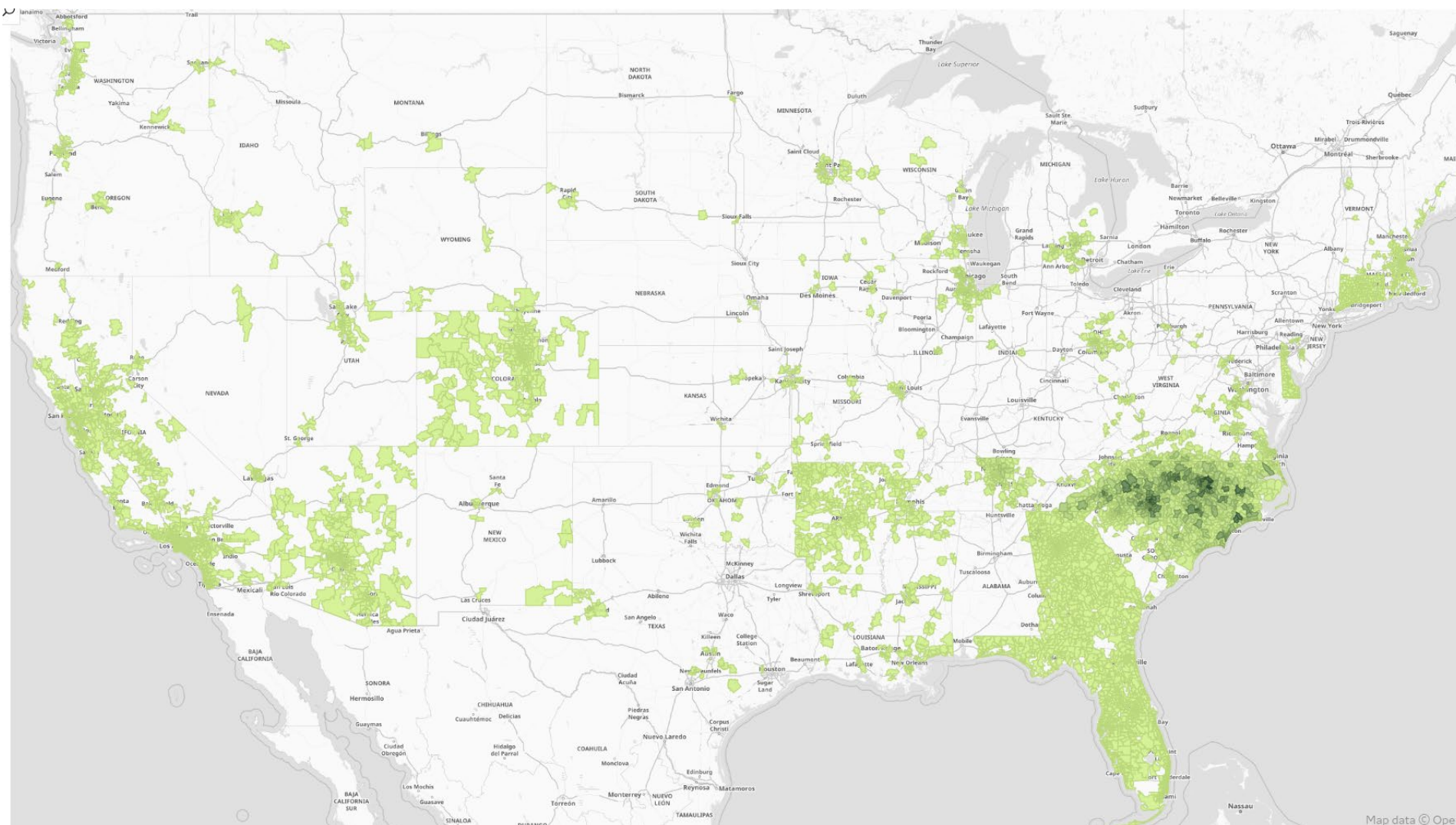
# Civitas Request For Unique Patients In All Zips

- Civitas made a request for participating health information exchanges (HIEs) to share U.S. zip codes and unique patient counts in each zip code.
- We submitted the data to fulfill the Civitas request.
- Civitas compiled the data from all submitting HIEs.
- Civitas built a U.S. coverage map (published copy TBD).
- We built a U.S. coverage map specifically for NC HealthConnex coverage.





# NC HealthConnex U.S. Patient Coverage Map



- NC HealthConnex U.S. patient coverage maps
- All zips containing 10+ patients across the U.S.



# Working Towards Digital Quality Measures (DQM)

*Data Quality Improvement (DQI) Dashboarding*

# DQI Dashboard Pages



- dQM by Facility
- Blood Pressure Measure
- HBA1C Measure
- Depression Measure
- Research Data Quality
- Research Fields
- Research Timeline
- Research Values
- Research Description
- EDA Code Values

# DQI Dashboard Filters

- The filters below can be used to focus on records of interest
  - Field, Data Source, dQM, Early Adopter, Focus Year, Quality Score & Encounter Date
- The Field filter allows us to filter on any of the variables in the data
  - Tag Facility, Code, Description, SDA, Unit & Value

The screenshot displays the DQI Dashboard Filters interface. It features a top row of five dropdown filters: 'Field' (set to 'TagFacility'), 'Data Source' (set to 'Table'), 'DQM' (set to 'DQM'), 'Early Adopter' (set to 'Yes (100.00%)'), and 'Focus Year' (set to '2024 (53.99%)'). Below these is a section with five more filters: 'Past 90 Days' (a dropdown set to 'Past 90 Days'), 'Quality Score' (a range slider from 54.55% to 95.45%), 'Encounter Date' (a date range slider from Jan 2024 to Dec 2024), 'Patient' (a text input field with 'Enter Patient...' placeholder), and 'Encounter' (a text input field with 'Enter Encounter...' placeholder). An information icon is located below the Patient and Encounter filters.



# DQI Dashboard By Facility

- Dashboard provides insights into the codes of focus that are not complete or inconsistent
  - Diagnosis, Problem, Order, Procedure, Observation and Lab Results

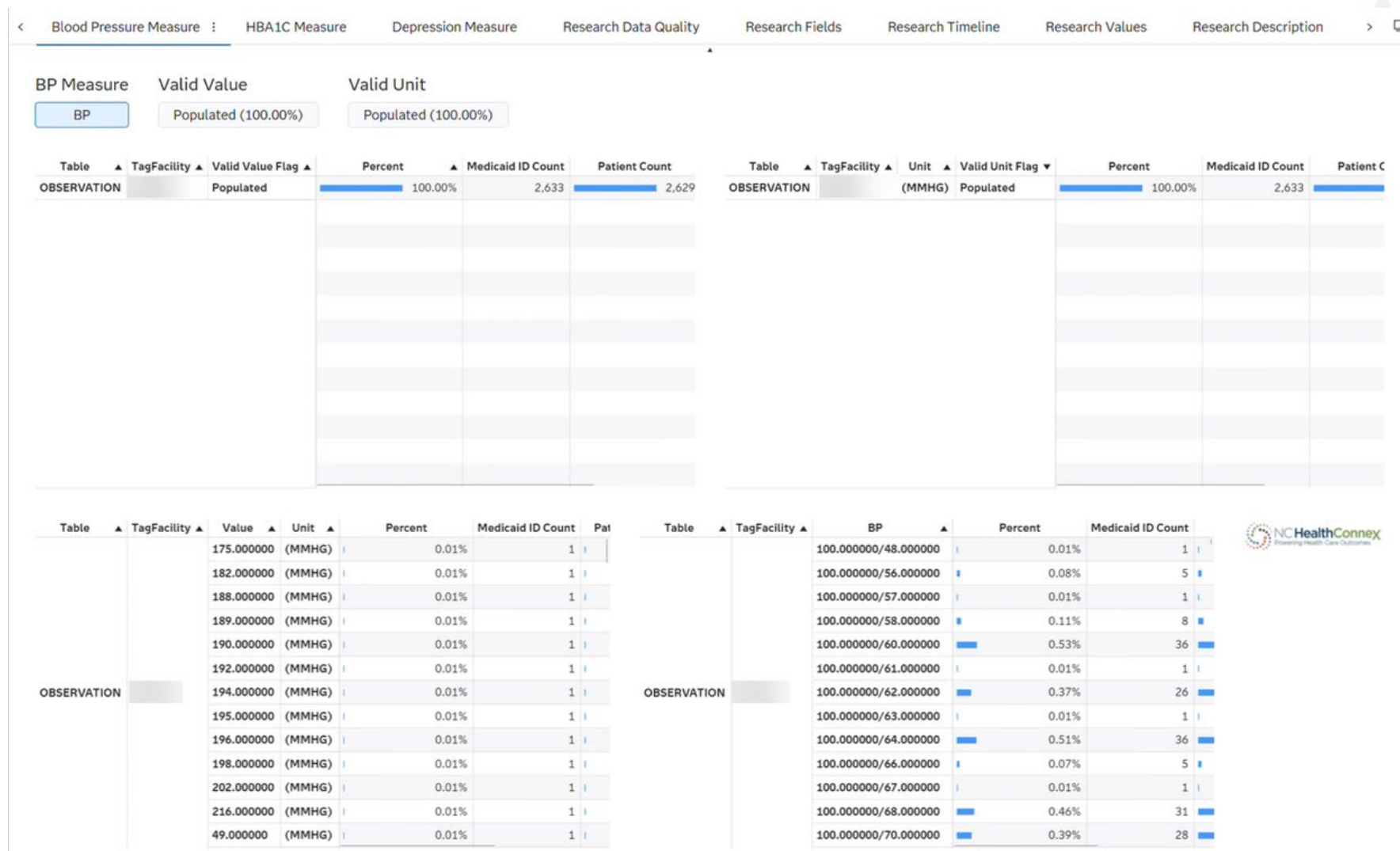


[DQM By Facility](#) : 
 [DQM By Facility & Table](#)
[Blood Pressure Measure](#)
[HBA1C Measure](#)
[Depression Measure](#)
[Research Data Quality](#)
[Research Fields](#)
[Research Timeline](#)
[>](#)
[📄](#)

Table ▲		LABRESULTS			OBSERVATION			ORDER			PROCEDURE		
DQM ▲	Field ▲	Percent	Medicaid ID Count	Patient Count	Percent	Medicaid ID Count	Patient Count	Percent	Medicaid ID Count	Patient Count	Percent	Medicaid ID Count	Patient Count
BP		.	—	—	1.79%	2,633	2,629	.	—	—	.	—	—
		.	—	—	.	—	—	.	—	—	0.00%	2	2
		.	—	—	.	—	—	0.00%	1	1	0.00%	1	1
DEPRESSION		.	—	—	.	—	—	0.05%	288	288	.	—	—
		.	—	—	.	—	—	0.84%	2,537	2,529	0.11%	509	509
		.	—	—	.	—	—	1.75%	2,966	2,964	0.00%	4	4
		.	—	—	.	—	—	5.49%	11,375	11,365	0.75%	2,458	2,456
		.	—	—	.	—	—	44.45%	98,428	98,312	0.09%	688	687
HBA1C		0.00%	1	1	.	—	—	.	—	—	.	—	—
		1.24%	4,394	4,377	.	—	—	1.39%	4,556	4,539	1.26%	4,507	4,490
		0.62%	2,711	2,707	.	—	—	0.62%	2,710	2,706	0.61%	2,645	2,641
		3.70%	13,401	13,386	.	—	—	4.22%	14,254	14,240	3.90%	14,318	14,303
		11.53%	58,572	58,502	.	—	—	2.29%	17,690	17,677	13.29%	66,464	66,368

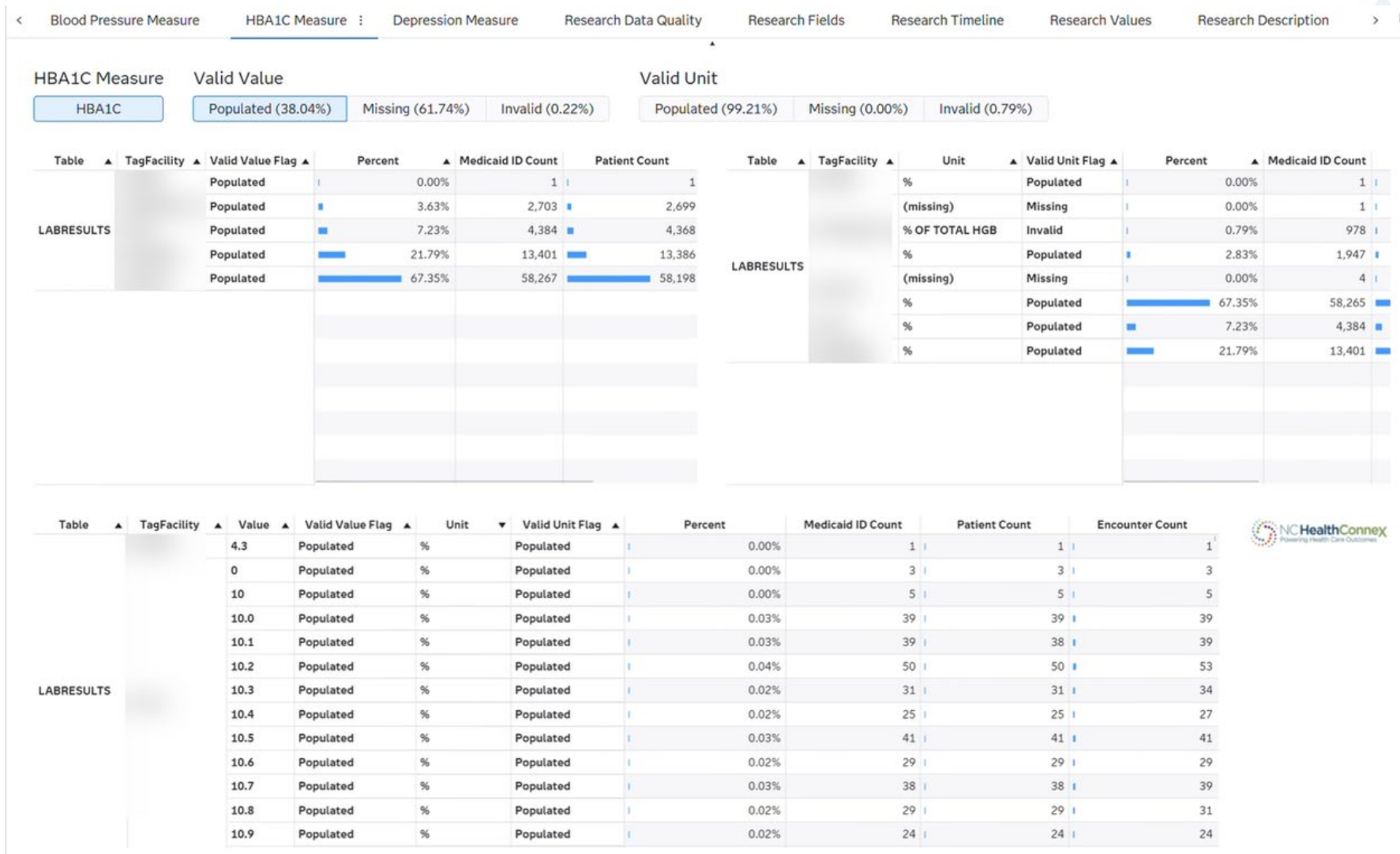
# DQI Dashboard – Blood Pressure Measure

- Reflects an organization submitting BP coded encounters



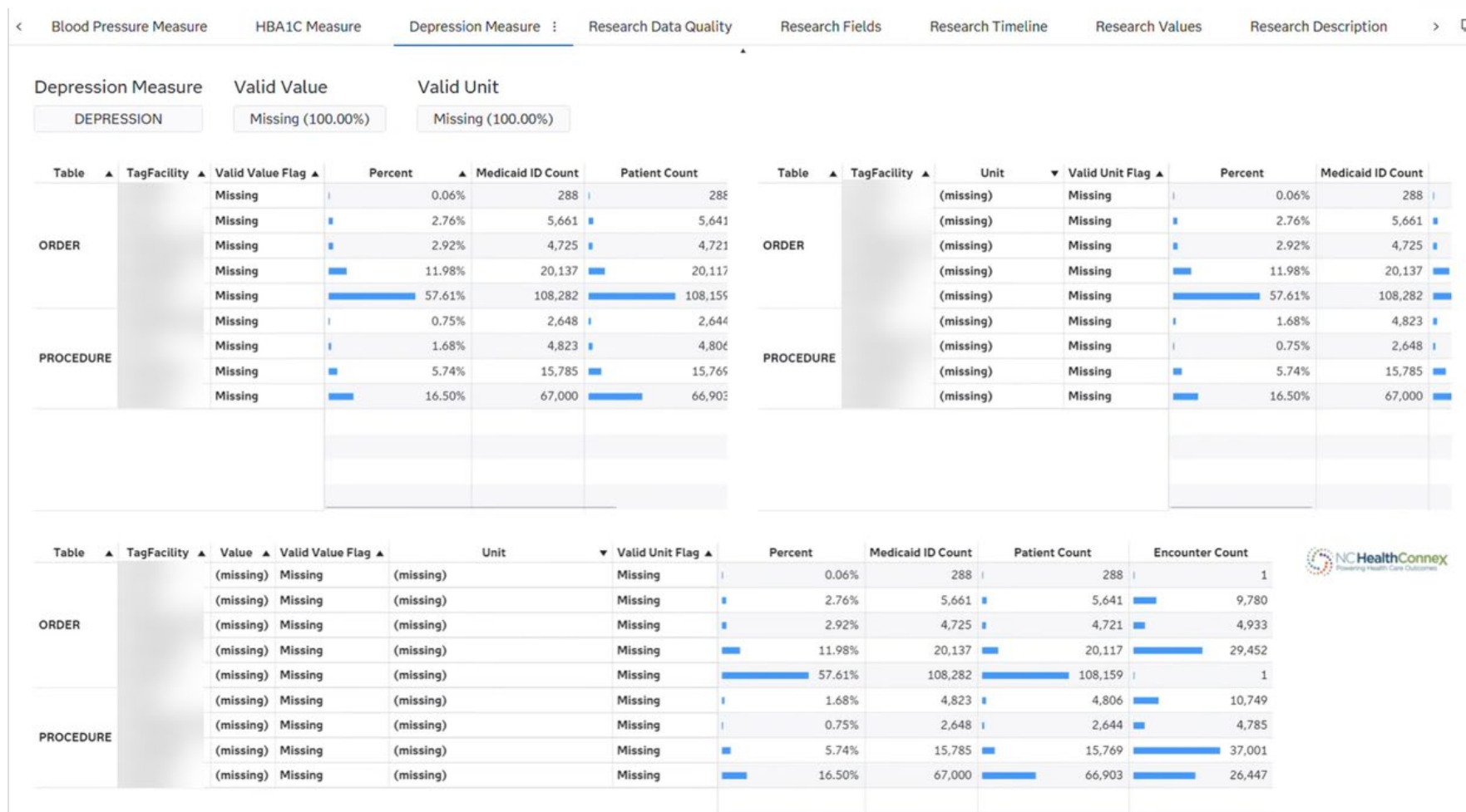
# DQI Dashboard – HBA1C Measure

- Reflects an organization submitting HBA1C coded values



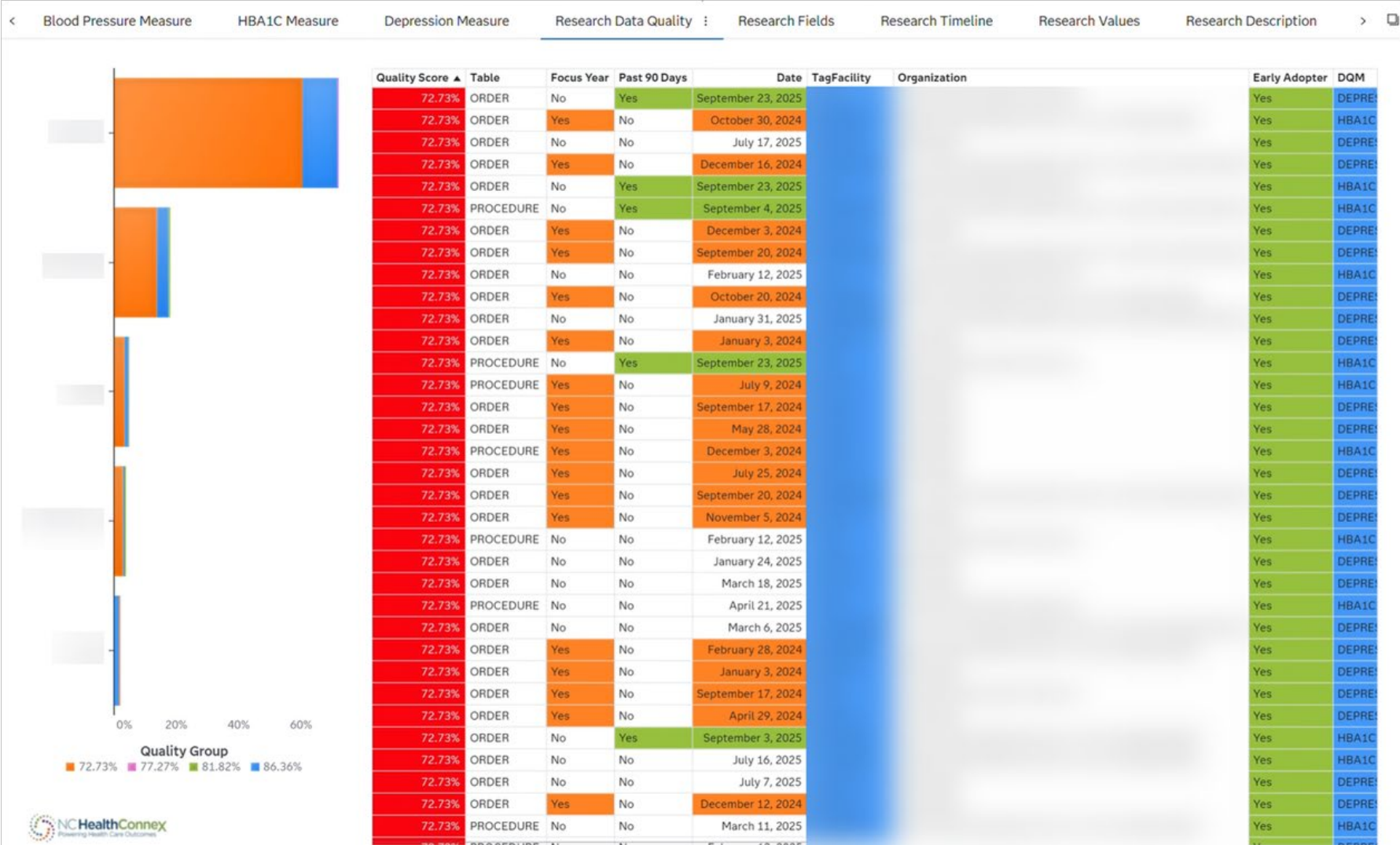
# DQI Dashboard – Depression Screening and Follow-Up Measure

- Reflects an organization missing key information for the Depression Screening measure



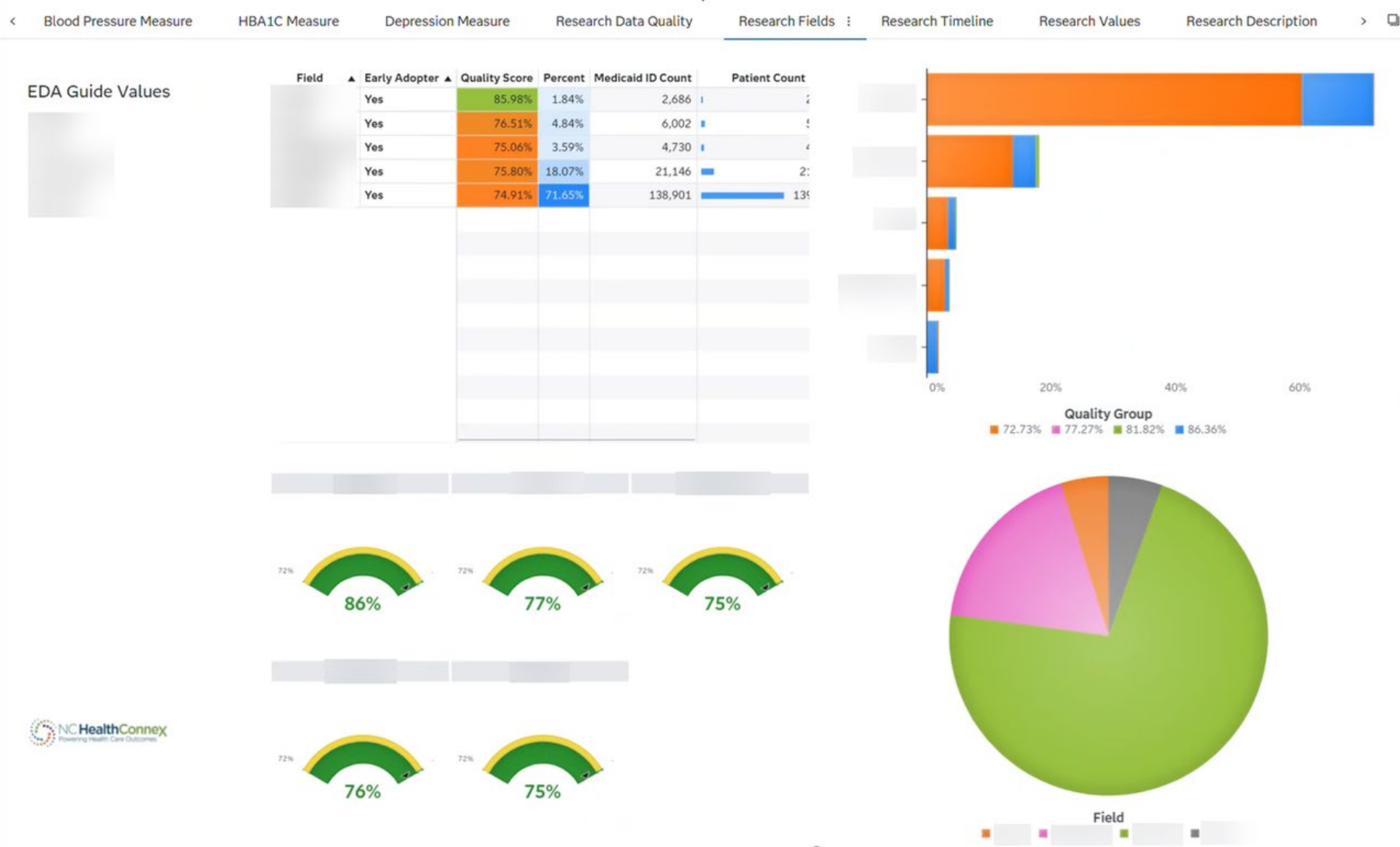


# DQI Dashboard – Research Data Quality



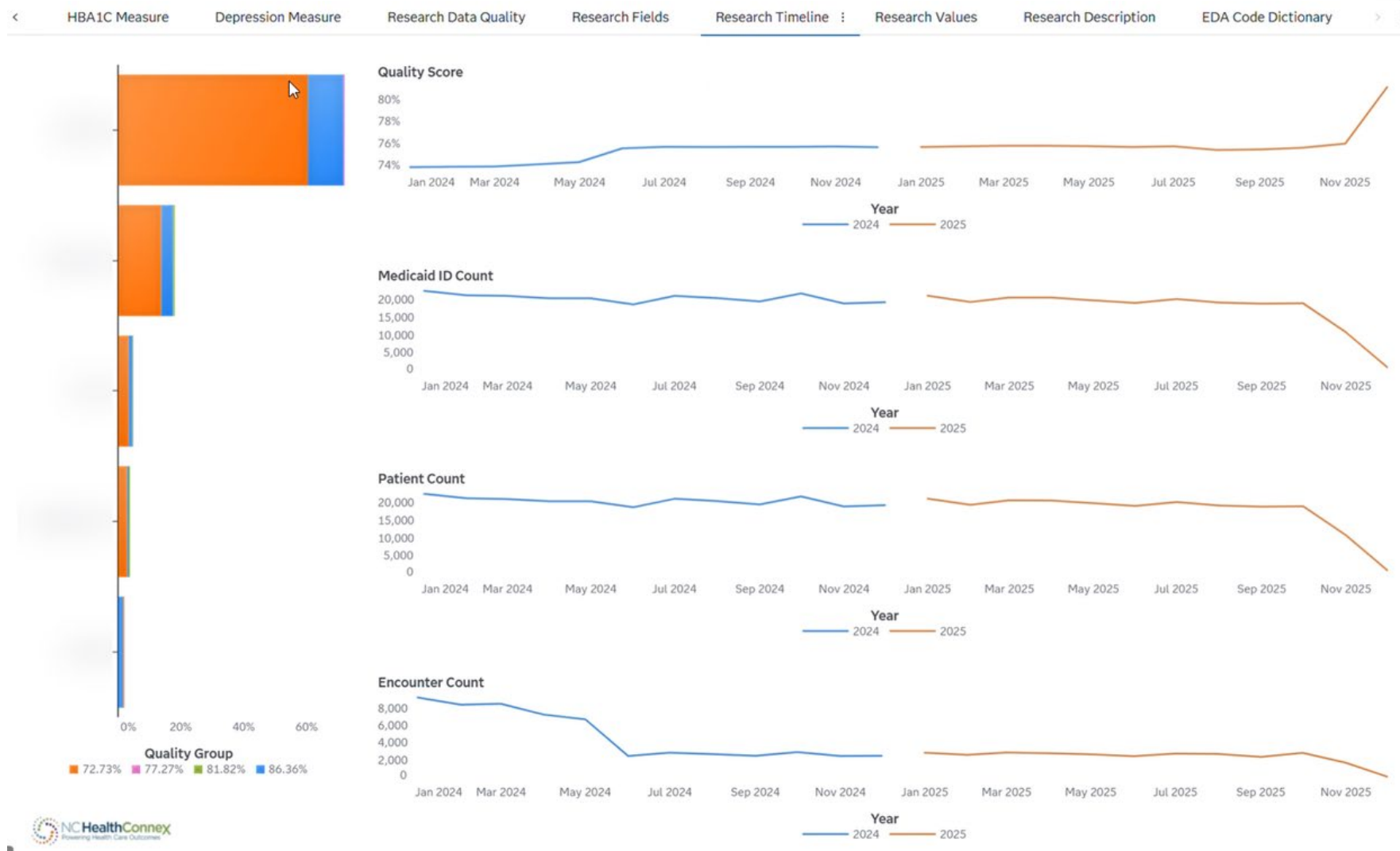
# DQI Dashboard – Research Fields

- Reflects an organization’s overall quality



# DQI Dashboard – Timeline

- Data Quality Scores improve over time for an Organization



# DQI Dashboard – Research Code Descriptions

- Ability to search for code descriptions





# DQI Dashboard – Code Dictionary

- Example of supporting values contributing to the dashboard



<	HBA1C Measure	Depression Measure	Research Data Quality	Research Fields	Research Timeline	Research Values	Research Description	EDA Code Dictionary	:	>	
---	---------------	--------------------	-----------------------	-----------------	-------------------	-----------------	----------------------	---------------------	---	---	--

DQM	▲	DQM_CODE	DQM_DESCRIPTION	DQM_SDA	DQM_CODE_TYPE
BP		271649006	SYSTOLIC BLOOD PRESSURE (OBSERVABLE ENTITY)	SNOMED	
BP		271650006	DIASTOLIC BLOOD PRESSURE (OBSERVABLE ENTITY)	SNOMED	
BP		3074F	MOST RECENT SYSTOLIC BLOOD PRESSURE LESS THAN 130 MM HG (DM) (HTN, CKD, CAD)	CPT	
BP		3075F	MOST RECENT SYSTOLIC BLOOD PRESSURE 130-139 MM HG (DM) (HTN, CKD, CAD)	CPT	
BP		3077F	MOST RECENT SYSTOLIC BLOOD PRESSURE GREATER THAN OR EQUAL TO 140 MM HG (HTN, CKD, CAD) (DM)	CPT	
BP		3078F	MOST RECENT DIASTOLIC BLOOD PRESSURE LESS THAN 80 MM HG (HTN, CKD, CAD) (DM)	CPT	
BP		3079F	MOST RECENT DIASTOLIC BLOOD PRESSURE 80-89 MM HG (HTN, CKD, CAD) (DM)	CPT	
BP		3080F	MOST RECENT DIASTOLIC BLOOD PRESSURE GREATER THAN OR EQUAL TO 90 MM HG (HTN, CKD, CAD) (DM)	CPT	
BP		75995-1	DIASTOLIC BLOOD PRESSURE BY CONTINUOUS NON-INVASIVE MONITORING	LOINC	
BP		75997-7	SYSTOLIC BLOOD PRESSURE BY CONTINUOUS NON-INVASIVE MONITORING	LOINC	
BP		8453-3	DIASTOLIC BLOOD PRESSURE--SITTING	LOINC	
BP		8454-1	DIASTOLIC BLOOD PRESSURE--STANDING	LOINC	
BP		8455-8	DIASTOLIC BLOOD PRESSURE--SUPINE	LOINC	
BP		8459-0	SYSTOLIC BLOOD PRESSURE--SITTING	LOINC	
BP		8460-8	SYSTOLIC BLOOD PRESSURE--STANDING	LOINC	
BP		8461-6	SYSTOLIC BLOOD PRESSURE--SUPINE	LOINC	

# New Business

# Meeting Planning for 2026

Mark your availability for each quarter. All meeting times are 2:00 – 5:00 p.m. on either a Tuesday or a Wednesday at the end of each quarter.

Q1: <https://doodle.com/group-poll/participate/e9X0mkPd>

Q2: <https://doodle.com/group-poll/participate/dyKL3mga>

Q3: <https://doodle.com/group-poll/participate/e7JPGDOd>

Q4: <https://doodle.com/group-poll/participate/axjK3zBd>