Electronic Case Reporting & Interoperability Updates at the Texas Department of State Health Services

Texas Interoperability Symposium

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Texas Department of State Health Services (DSHS)

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Overview

- Public Health in Texas
- DSHS Onboarding Requirements for eCR
- Electronic Case Reporting (eCR) Updates
- Data Modernization Initiative & NEDSS Interoperability/Functionality Improvements
- State Health Analytics & Reporting Platform (SHARP)
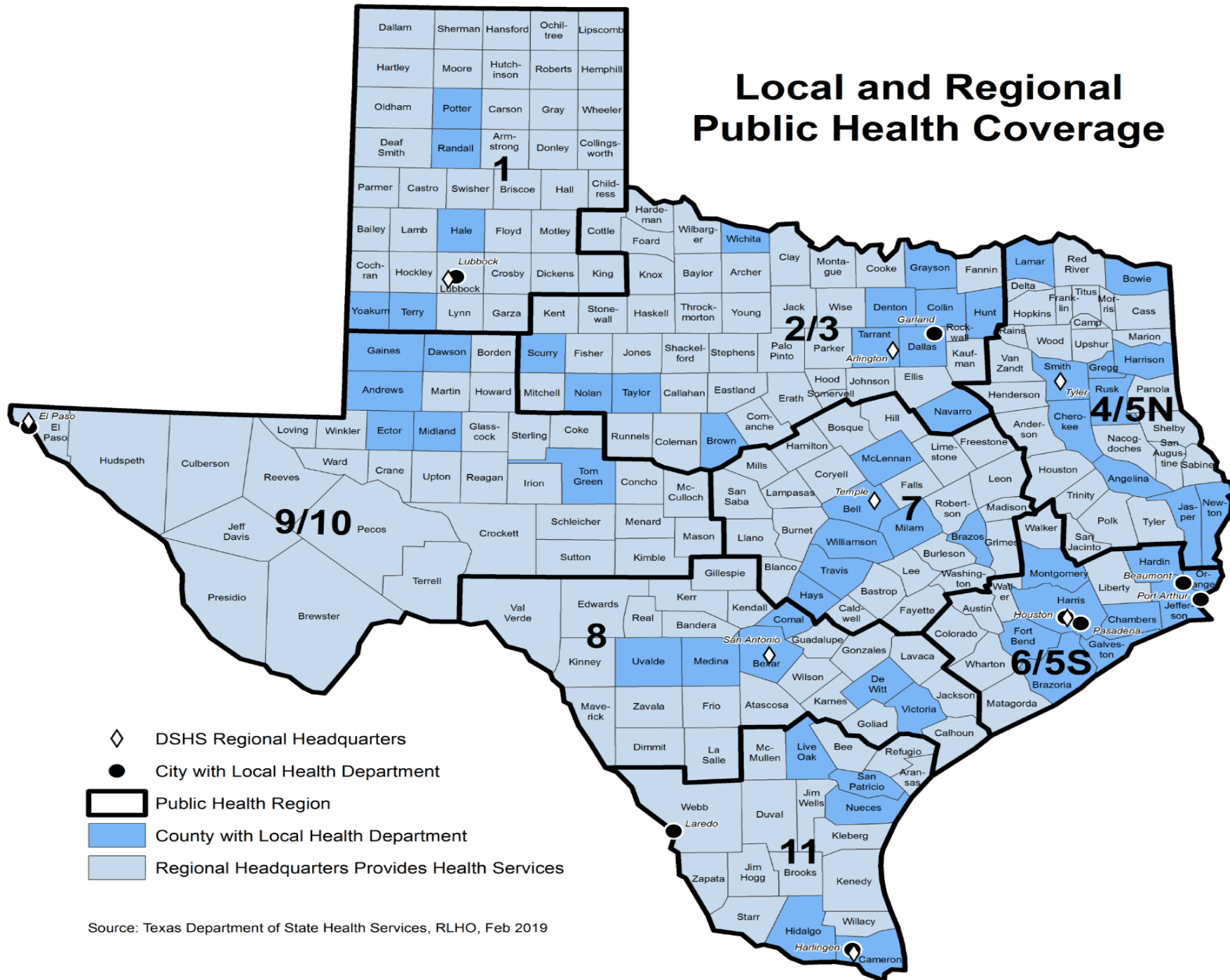- Successes

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Public Health in Texas

Local and Regional Public Health Coverage

Source: Texas Department of State Health Services, RLHO, Feb 2019

DSHS Office of Public Health Data Strategy & Modernization (OPHDSM)

OPHDSM was established by DSHS to improve the availability and use of public health data to inform decision making and action. This office is dedicated to leading, coordinating, and executing a comprehensive public health data strategy.

OPHDSM serves as a platform for better partnerships and collaboration around public health data and surveillance, including data modernization. This strategy and coordination include DSHS' programs as well as public health and other external partners.

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Office of Public Health Data Strategy & Modernization (OPHDSM)

Overall responsibilities of OPHDSM include:

- Managing public health core data systems, technology solutions and tools, and data policy essential to public health

- Promoting response-ready data and systems

- Incorporating end-user design principles to meet the needs of PHRs, LHDs, and stakeholder partners

- Prioritizing efforts to improve access to and the dissemination of data to inform decision-making

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Texas Public Health Data Strategy (TPHDS)

The Texas Public Health Data Strategy outlines the data, technology, policy, and administrative actions essential to exchange critical core data efficiently and securely across healthcare and public health. The strategy is designed to describe a path to address gaps in public health data, helping Texas become response-ready, and improve health outcomes for all.

- The Texas Public Health Data Strategy matters because
  - It advances core missions of robust public health data aimed at improving health outcomes,
  - Addresses the imperative of DSHS efforts to consistently deliver public health information and guidance to Texans in near real-time,
  - Builds on lessons learned during the COVID-19 pandemic and other recent public health threats to be more response-ready,
  - Aligns data modernization efforts at all levels of public health and across partners, focusing execution on near-term priority gaps,
  - Measures success with specific milestones, and
  - Creates accountability for public health data with DSHS's newly established OPHDSM

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Texas Public Health Data Strategy (TPHDS)

Goal 1: Strengthen the core of public health data

Goal 2: Accelerate access to analytic and automated solutions to support public health investigations and reduce health disparities among Texans

Goal 3: Visualize and share insights to inform public health action

**Goal 4:** Advance more open and interoperable public health data

- eCR is part of Goal 2 of the Texas Public Health Data Strategy developed by the Office of Public Health Data Strategy & Modernization (OPHDSM)

Public Health Informatics & Data Unit

Texas National Electronic Disease Surveillance System (TX NEDSS)

- TX NEDSS is the primary infectious disease integration system for conducting public health surveillance and epidemiology

- Is a cost-free, CDC-developed integrated information system

- 27 states & territories utilize the NEDSS system

- Texas is the largest instance of NEDSS

- ELR and eCRs are processed via TX NEDSS

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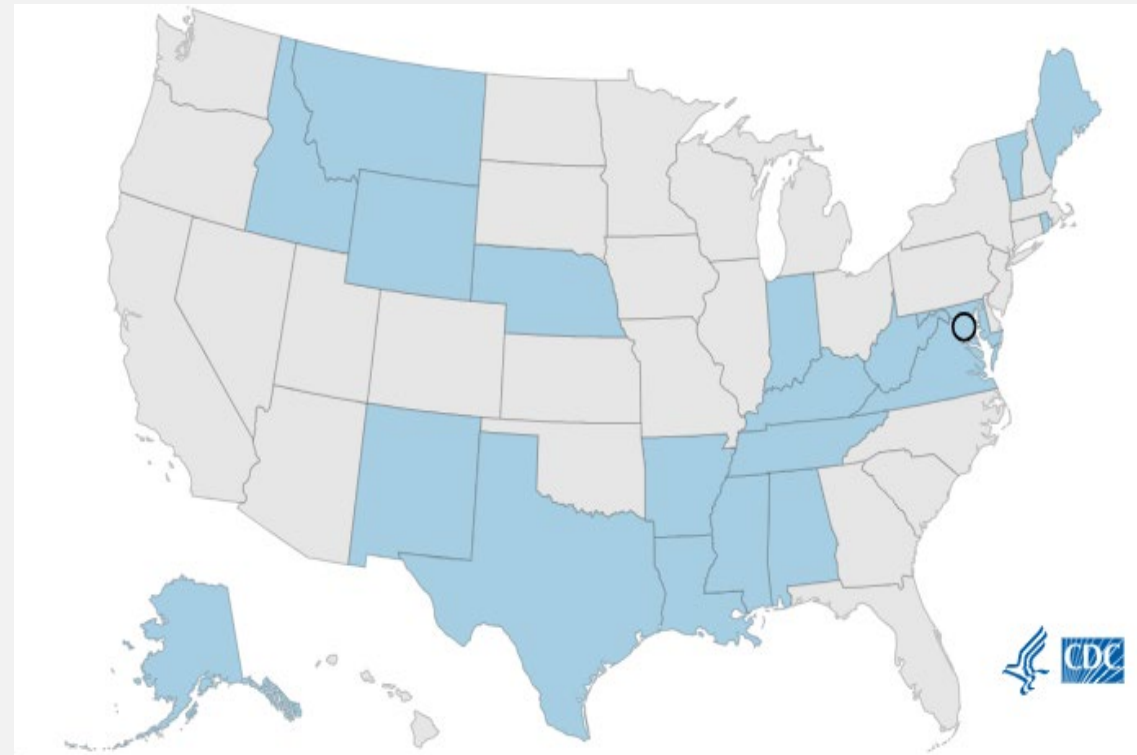
Texas National Electronic Disease Surveillance System (TX NEDSS)

Transparency across public health jurisdictions

Local
Regional
Central Office
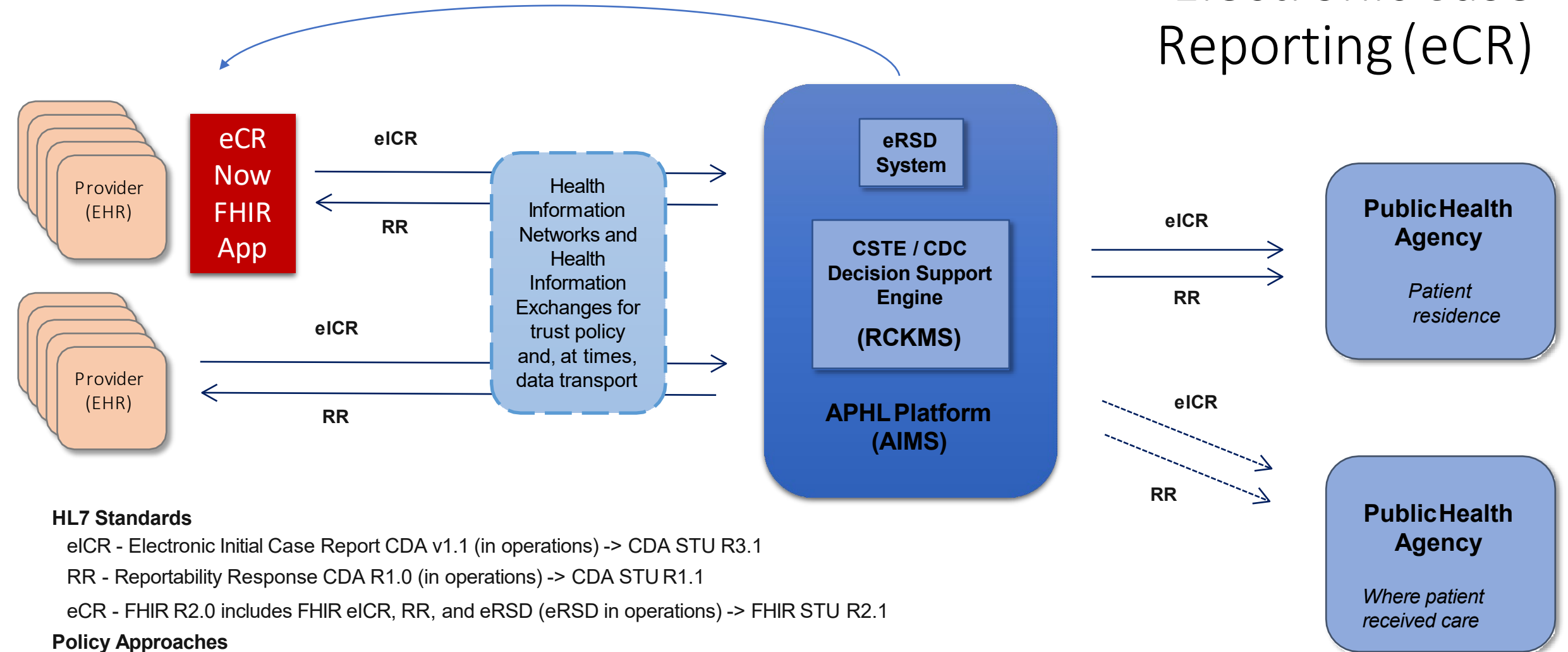
Approx 65 local and regional health departments

Supports 1400 public health staff

Over 100 disease conditions managed

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Electronic Case Reporting (eCR)

eRSD - Triggering and Reporting Set-Up

Provider (EHR)

eCR Now FHIR App

eICR

RR

Health Information Networks and Health Information Exchanges for trust policy and, at times, data transport

Provider (EHR)

eICR

RR

eRSD System

CSTE / CDC Decision Support Engine (RCKMS)

APHL Platform (AIMS)

eICR

RR

Public Health Agency

Patient residence

eICR

RR

Public Health Agency

Where patient received care

HL7 Standards

eICR - Electronic Initial Case Report CDA v1.1 (in operations) -> CDA STU R3.1

RR - Reportability Response CDA R1.0 (in operations) -> CDA STU R1.1

eCR - FHIR R2.0 includes FHIR eICR, RR, and eRSD (eRSD in operations) -> FHIR STU R2.1

Policy Approaches

eHealth Exchange, Carequality and CommonWell associated organizations, APHL participation agreement

Other Terms

RCKMS - Reportable Conditon Knowledge Management System

eRSD – Electronic Reporting and Surveillance Distribution
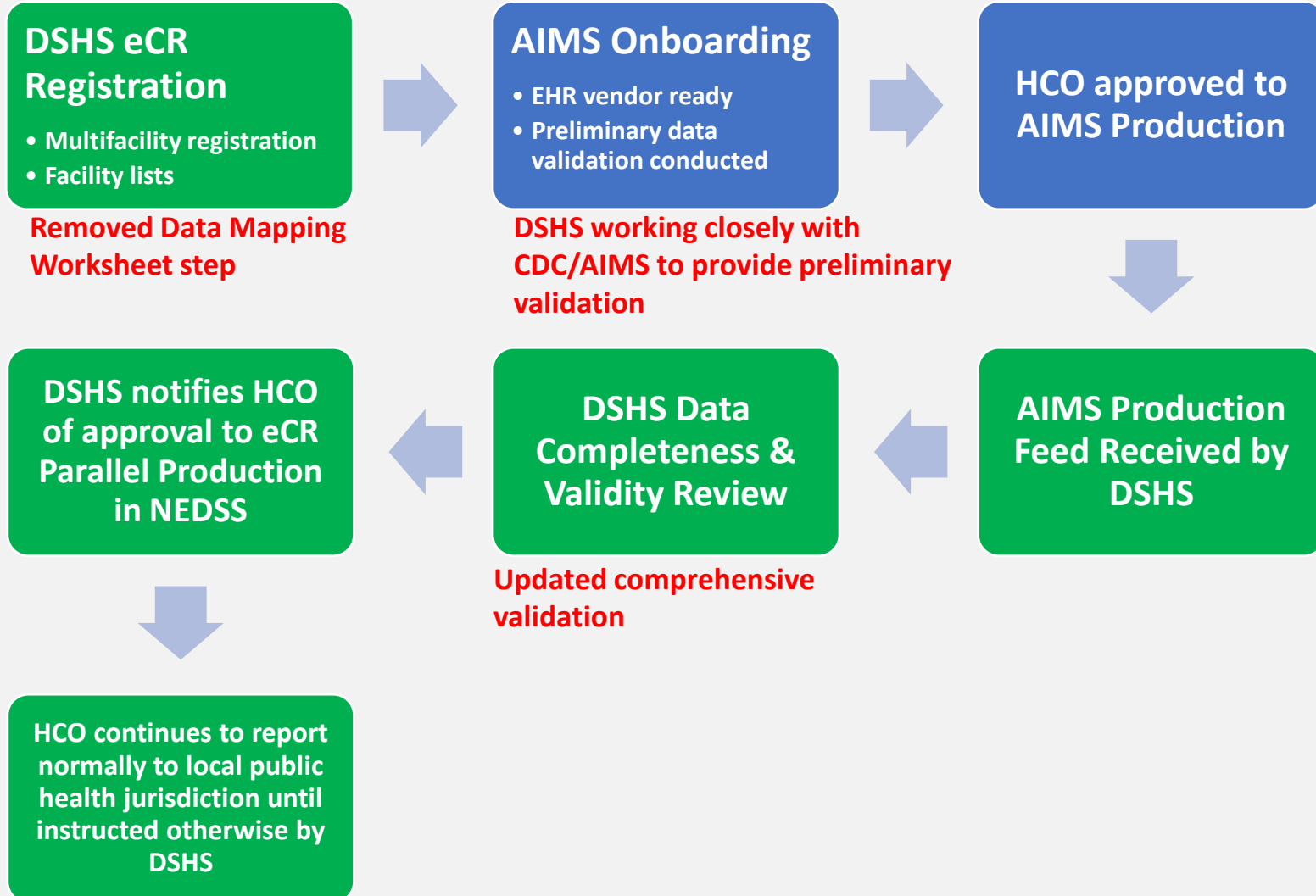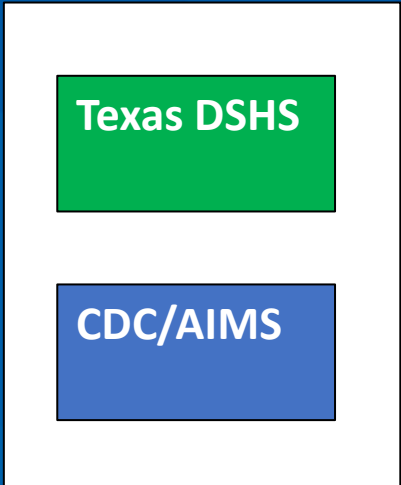
eCR Onboarding Updates

Electronic Case Reporting Update

DSHS declared readiness for electronic case reporting on <u>September 1, 2023</u>.

- The declaration was made specifically for **Critical Access Hospitals (CAHs) and Eligible Hospitals (EHs) in Texas** as defined by CMS.

- Although DSHS went live with eCR in September 2022, the declaration was delayed to provide time for hospitals subject to CMS PIP to prepare their EHR systems.

- DSHS communication efforts incorporated feedback from stakeholder partners.

eCR Onboarding Overview- DSHS & AIMS

Texas DSHS

CDC/AIMS

DSHS eCR Registration
- Multifacility registration
- Facility lists

Removed Data Mapping Worksheet step

AIMS Onboarding
- EHR vendor ready
- Preliminary data validation conducted

DSHS working closely with CDC/AIMS to provide preliminary validation

HCO approved to AIMS Production

AIMS Production Feed Received by DSHS

DSHS Data Completeness & Validity Review

Updated comprehensive validation

DSHS notifies HCO of approval to eCR Parallel Production in NEDSS

HCO continues to report normally to local public health jurisdiction until instructed otherwise by DSHS

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Checklist for Approval to eCR Parallel Production

- ☑ eCR registration with DSHS completed

- ☑ Facility list received

- ☑ AIMS eCR production status achieved

- ☑ Pass DSHS eCR data validation and completeness review

- ☑ HCO is fully onboarded for ELR with DSHS

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Epidemiology Workgroup Developing Initial Release Criteria for Manual Reporting

DSHS Division of Surveillance and Epidemiology (DSE) is leading a workgroup comprised of local and regional health department epidemiologists and management in establishing initial criteria for manual release.

Assessing local requirements, continued manual submissions, and incoming eCRs viewed in NEDSS

Establishing minimal fields required for public health follow up from patient medical records
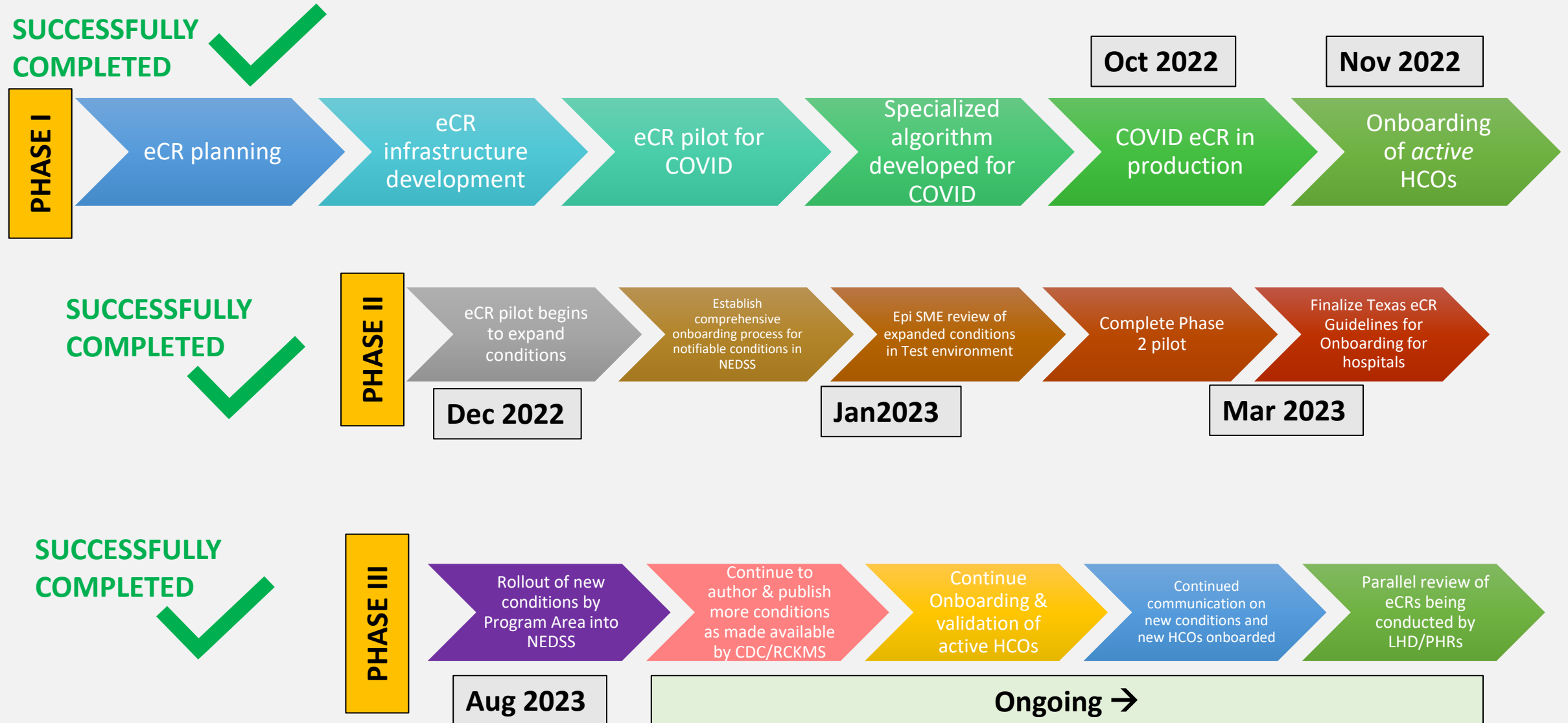
Goal is to establish initial criteria by end of 2024

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eCR Phases and Timelines

SUCCESSFULLY COMPLETED ✓

PHASE I

				Oct 2022	Nov 2022

- eCR planning
- eCR infrastructure development
- eCR pilot for COVID
- Specialized algorithm developed for COVID
- COVID eCR in production
- Onboarding of *active* HCOs

SUCCESSFULLY COMPLETED ✓

PHASE II

- eCR pilot begins to expand conditions
- Establish comprehensive onboarding process for notifiable conditions in NEDSS
- Epi SME review of expanded conditions in Test environment
- Complete Phase 2 pilot
- Finalize Texas eCR Guidelines for Onboarding for hospitals

Dec 2022   **Jan2023**   **Mar 2023**

SUCCESSFULLY COMPLETED ✓

PHASE III

- Rollout of new conditions by Program Area into NEDSS
- Continue to author & publish more conditions as made available by CDC/RCKMS
- Continue Onboarding & validation of active HCOs
- Continued communication on new conditions and new HCOs onboarded
- Parallel review of eCRs being conducted by LHD/PHRs

Aug 2023   **Ongoing →**

Program Area & System

TX NEDSS

- All reportable disease conditions except HIV/STD (64)
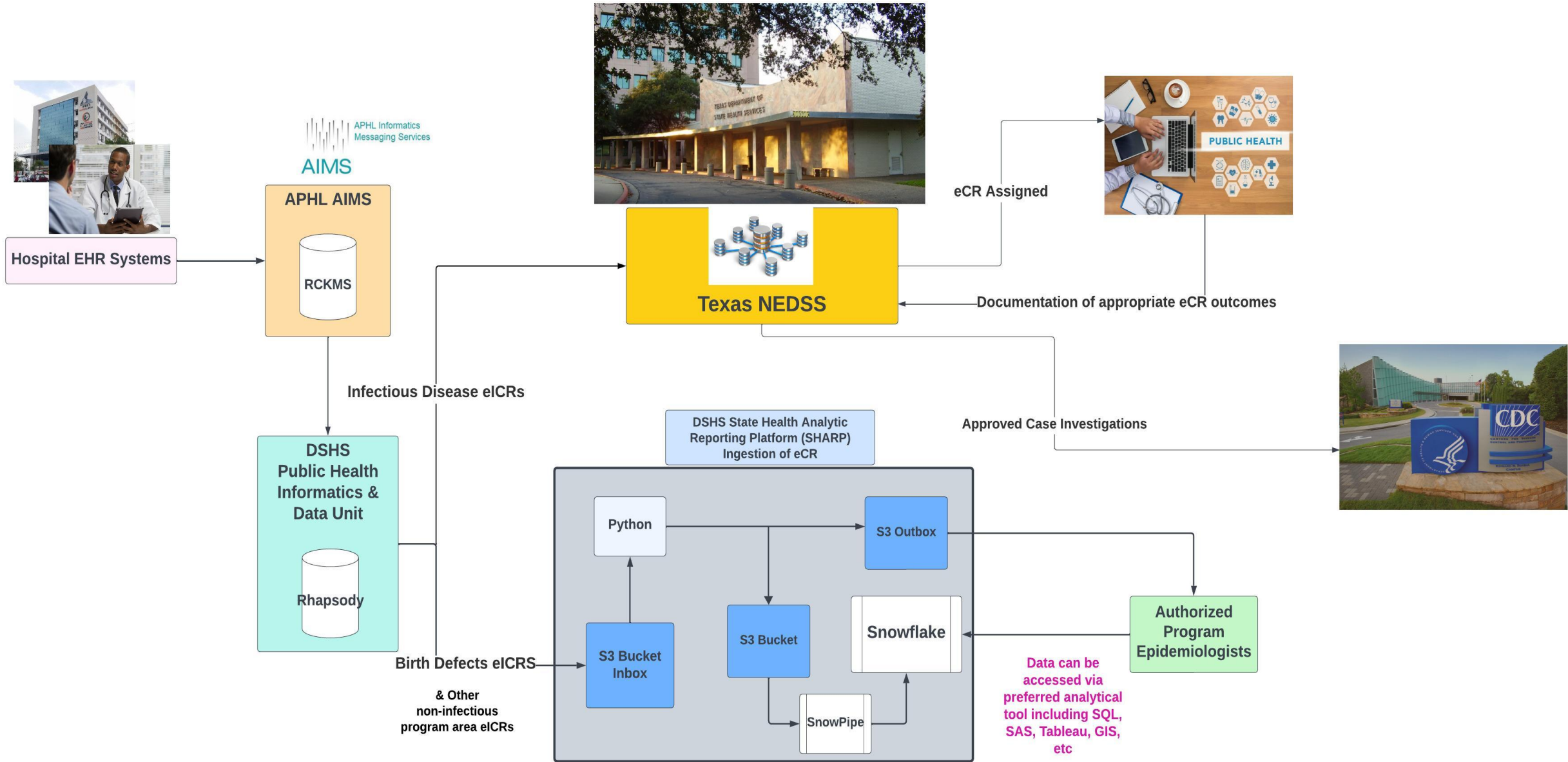- TB program just transitioned to TX NEDSS (3)- pending

MAVEN (THISIS)

- HIV/STD (7)- Pending
- Preparing to transition to TX NEDSS

Texas State Health Analytics Reporting Platform Production (SHARP)

- Birth Defects (11)
- Environmental/Occupational Health (2)- Pending testing
- Newborn Screening- Pending

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Electronic Initial Case Report Processing Pathways

Hospital EHR Systems

APHL AIMS
RCKMS

Texas NEDSS

eCR Assigned

PUBLIC HEALTH

Documentation of appropriate eCR outcomes

Infectious Disease eICRs

DSHS
Public Health
Informatics &
Data Unit

Rhapsody

DSHS State Health Analytic
Reporting Platform (SHARP)
Ingestion of eCR

Approved Case Investigations

CDC

Birth Defects eICRS

& Other
non-infectious
program area eICRs

Python

S3 Outbox

S3 Bucket
Inbox

S3 Bucket

Snowflake

SnowPipe

Authorized
Program
Epidemiologists

Data can be
accessed via
preferred analytical
tool including SQL,
SAS, Tableau, GIS,
etc

Current eCR Phase

Actively onboarding eligible HCOs

Continued support & maintenance of successfully onboarded HCOs and conditions

Expansion to support non-infectious disease eCR processing (SHARP)

Active planning for transition of HIV/STD conditions into NEDSS

Ongoing communication and collaboration with NEDSS users, local and regional health depts, HCOs, AIMS, CDC & other eCR stakeholders

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eCRs Processed in Texas NEDSS (237K+)
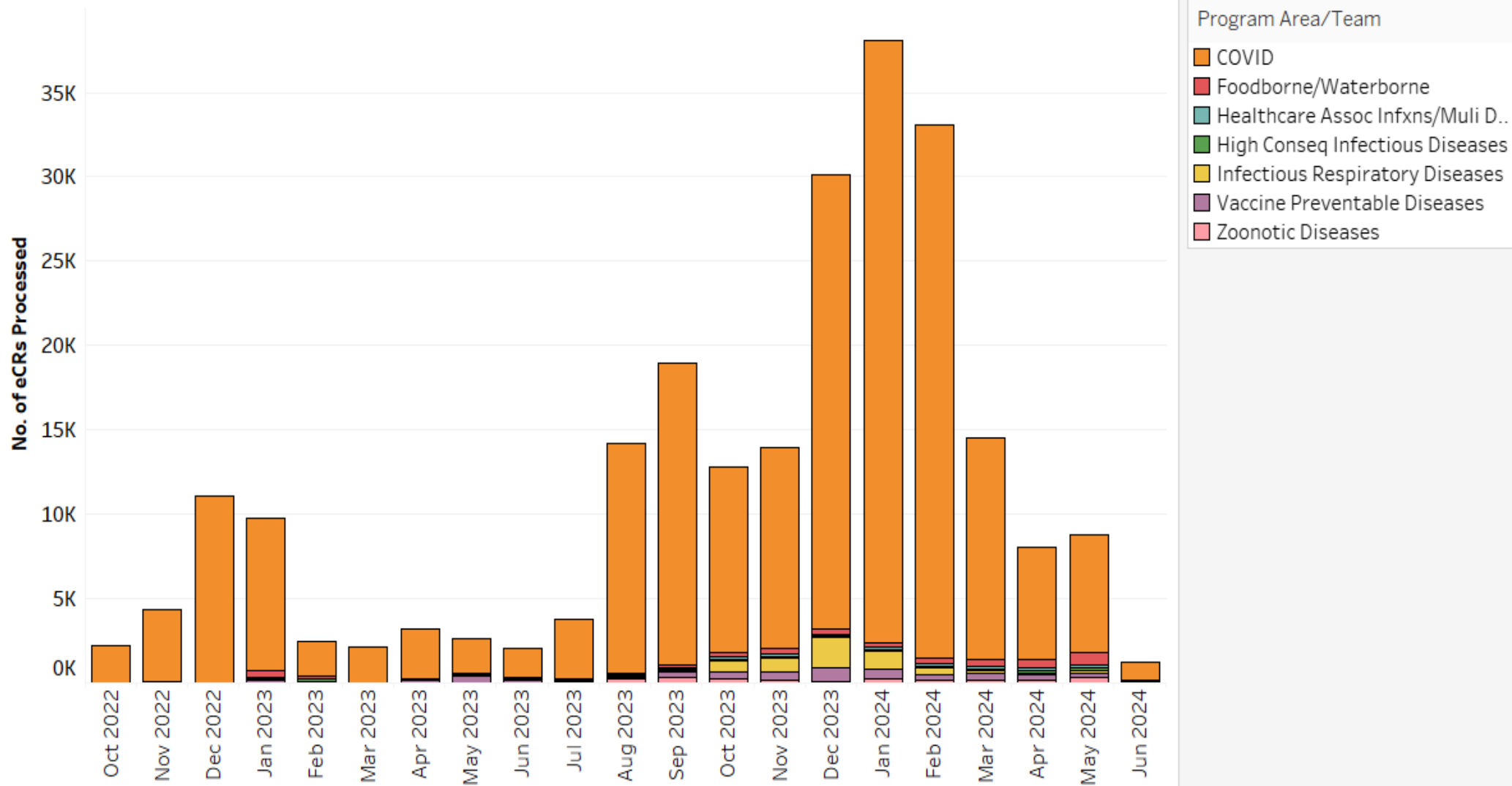
NonCOVID eCRs Processed in Texas NEDSS (20K+)
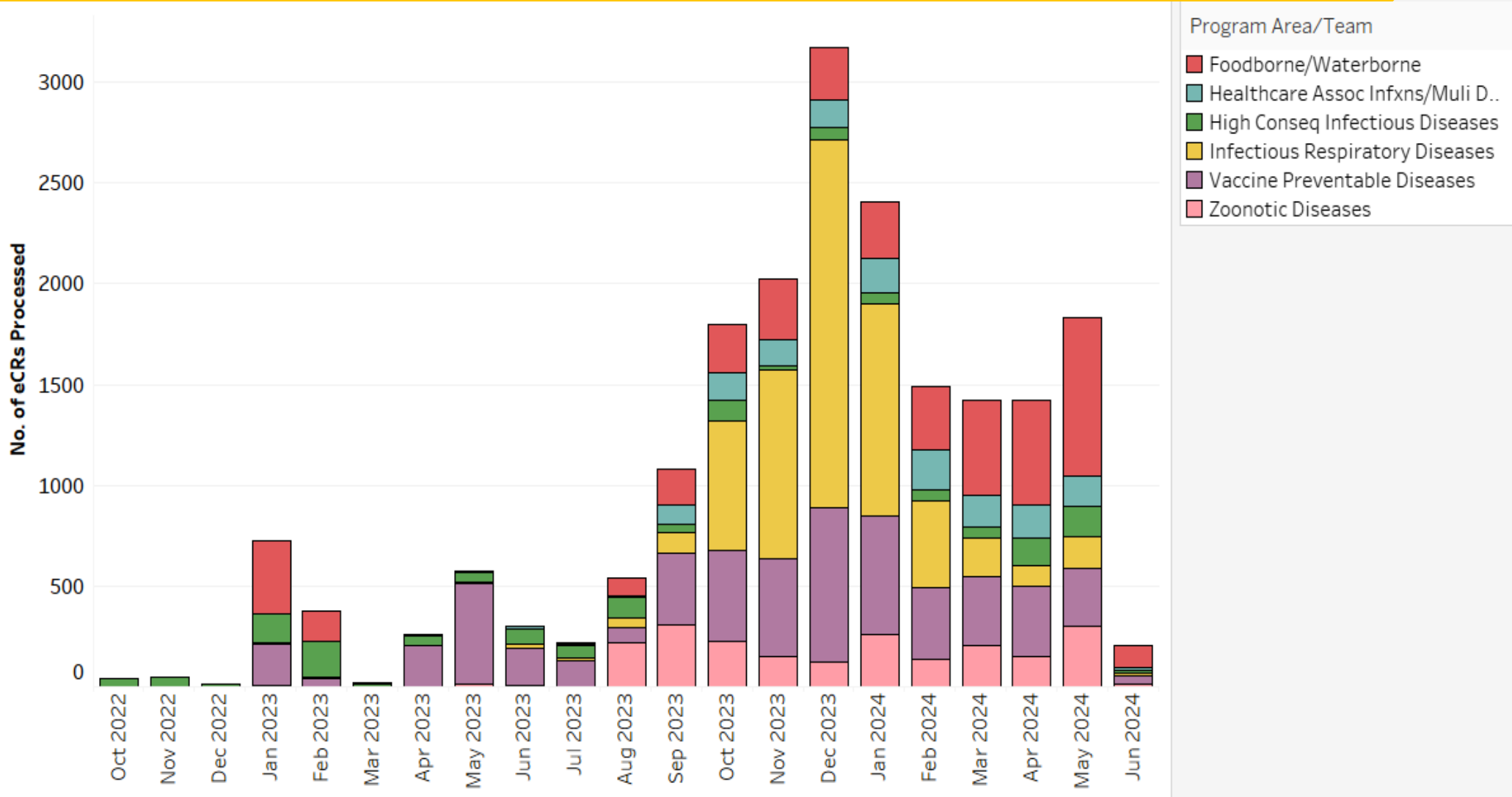
Focus on Expanding eCR Conditions Reporting

- With rollout of most infectious disease conditions completed, new focus is on assessing completeness

- Encouraging expansion of HCOs who originally onboarded with COVID only/COVID &mpox/orthopox to complete sending of all conditions available in the eRSD

- 46% of HCOs currently in production are submitting nonCOVID conditions

- DSHS will be conducting outreach targeting expansion of eRSD for HCOs

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Healthcare Organizations in eCR Production in Texas NEDSS

Nov 2023 eCR Submitters
- 476 Facilities

May 2024 eCR Submitters
- 622 Facilities
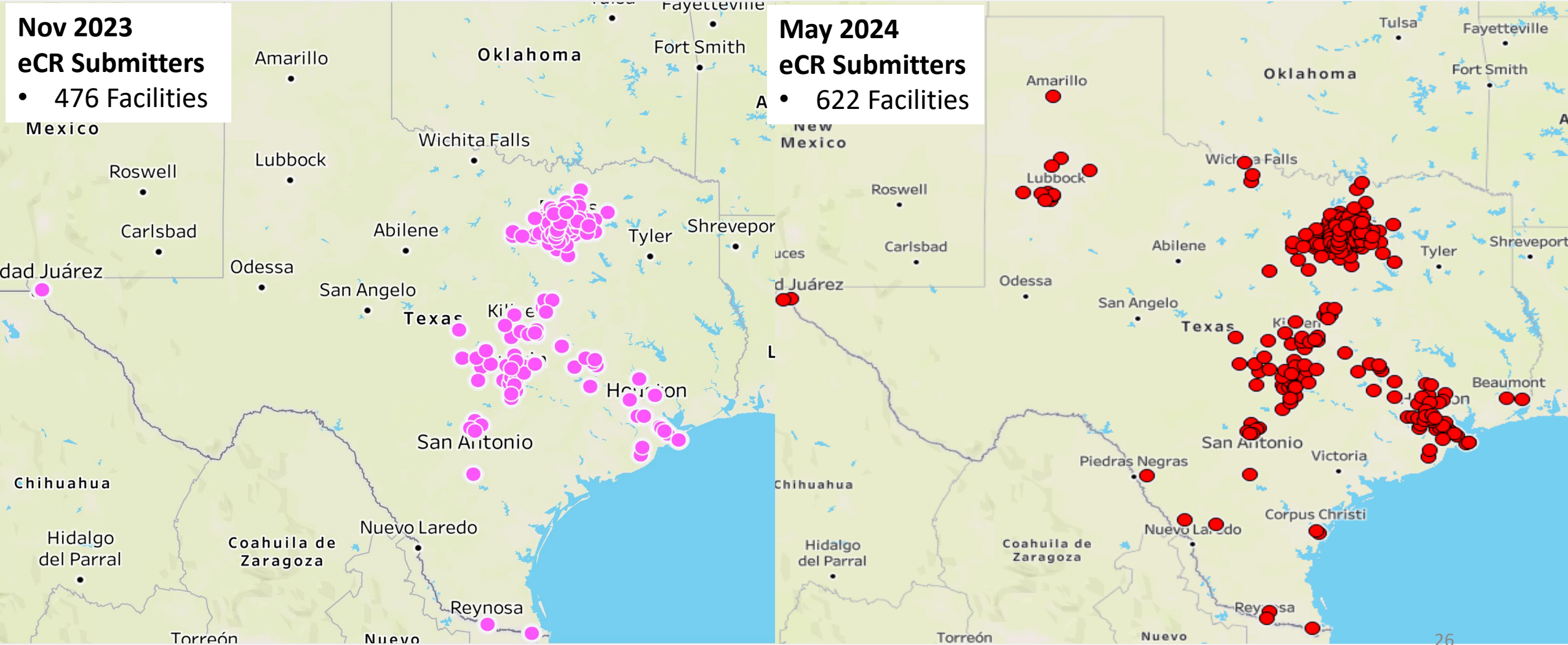
Impact of eCRs

Timelier notification to Public Health of reportable infectious diseases

More enriched data to drive responses

Ability to better triage and prioritize Public Health follow up

Reduced transmission of infectious diseases

Reduced costs

Reduced burden in follow up to HCOs

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Data Modernization Initiative & NEDSS Interoperability and Functionality Improvements

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Data Modernization Initiative (DMI)

DMI Goal 1: Modernize foundational IT infrastructure to support scalable, flexible, and timely access to data, systems, and services in the public health ecosystem

DMI Goal 2: Modernize and connect core public health systems to improve data collection, sharing, and exchange

DMI Goal 3: Improve adoption of common data standards to improve data quality, sharing, and interoperability

DMI Goal 4: Enhance data and IT governance strategy and implementation

DMI Goal 5: Integrate, consolidate, and/or store data across core public health systems into a centralized data repository to increase data linkages and analyses

DMI Goal 6: Advance the use of data visualization, forecasting, and predictive analytics to translate public health data into actionable decision-making

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NEDSS Upgrades

TX NEDSS background

- March 2020 Texas had oldest version compared to other NEDSS states
- Quickly upgraded several NBS versions in the first 6 months
  - Started NBS v 5.2.03 in March 2020
  - Now on NBS v **6.0.15.1** (most current version)- **Total of 20 upgrades!**
    - *9 upgrades were done between March 2020 and December 2020*
- Deploying **NBS 6.0.16.1** in June 2024 (testing in lower environments have started)

Moved NEDSS server from Oracle to SQL server in May2020 - June 2020

Improved the ELR importer by moving it onto a separate server

- Prior to upgrades, system processed on average 1000 ELRs per day
- Now can process up to **400k ELRs** per day
- No interference with other jobs running

Texas now leading the country in NEDSS upgrades and enhancements

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Completed Enhancements to Highlight

Data Automation Functionality ("*WDS Logic*") Implemented

Integration of NEDSS with ImmTrac2

Outbreak Management Module

Geocoding tool added for ELRs and eCRs

TB/LTBI program module added to NEDSS
- Page builder, users added, permission sets established, test code mappings, WDS logic

Security Management Module Upgrade

Several page builders added
- C. auris, pertussis, mumps, mpox, TB

eCR Enhancements
- Expansion of eCR datamart for users, enhanced reports made available
- Archival process implemented for eCRs

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State Health Analytics & Reporting Platform (SHARP)

SHARP won the **Project Excellence Award** from the Texas Association of State Systems for Computing Communications (**TASSCC**) in August 2021

What is SHARP?

The State Health Analytics & Reporting Platform (SHARP) is designed to **expand data analytics capabilities** and reduce manual processes to produce **reliable reports and analyses.** SHARP also enables and enhances the **data governance** of the agency's data assets.

BACKGROUND

What is SHARP?

SHARP is a **platform**, which means it is comprised of a **data warehouse** and various **data analytics and visualization tools** that work together for reporting and analysis.

SHARP is a **collection of tools and technologies,** not a singular tool or application. This means SHARP itself is not something you log into, rather you log into each of the tools that are part of SHARP as you need them.

What can SHARP do?

SHARP **integrates**, **stores**, and **enables the analysis** of public health data.

SHARP can **automate complex, tedious data processing jobs** to produce reliable, efficient reports and dashboards.

The platform **reduces the need for manual data processing,** increases **efficiency,** and produces **reliable reports & analysis.**

What data are in SHARP?

Data in **SHARP come from various sources** (data sources DSHS already leverages) and the data are ingested into the platform **for reporting and analysis**.

SHARP only contains **data that serve specific reporting needs**. All data in SHARP must be approved to be a part of the platform.
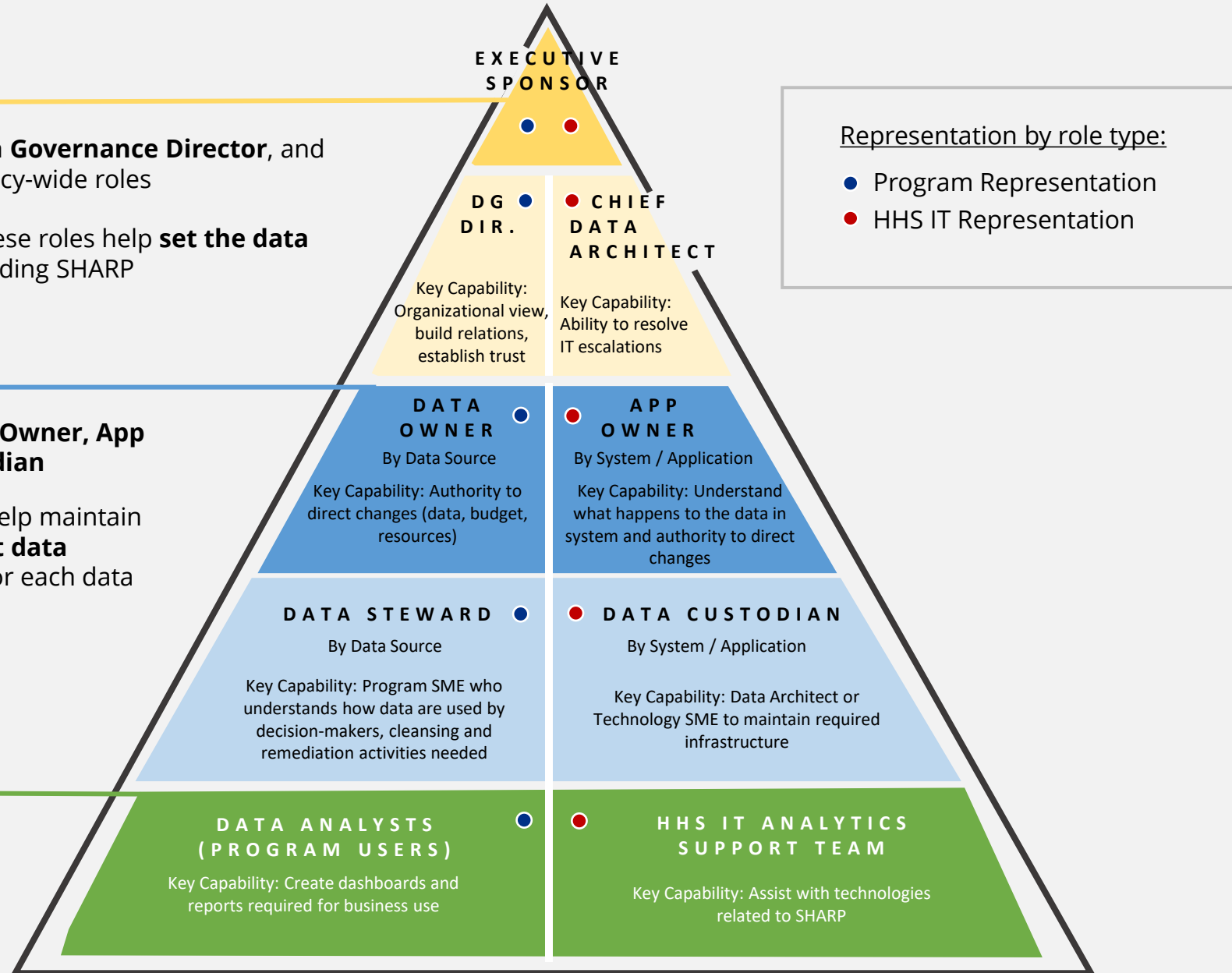
SHARP stands for State Health Analytics & Reporting Platform.

Who is involved?

- The **Executive Sponsors**, **Data Governance Director**, and **Chief Data Architect** are agency-wide roles

- The individuals who occupy these roles help **set the data strategy for the agency**, including SHARP

- Each data source has its respective **Data Owner, App Owner, Data Steward,** and **Data Custodian**

- The individuals who occupy these roles help maintain key documentation and **ensure the right data governance activities are happening** for each data source in SHARP

- SHARP's primary users are **DSHS Data Analysts.** Data Analysts refer to any program staff who interact with data, such as epidemiologists and research specialists.

- **HHS IT Analytics Support Team** and outside contractors work with Programs to set up data sources in SHARP and maintain the data

EXECUTIVE SPONSOR

Representation by role type:
- Program Representation
- HHS IT Representation

DG DIR.
Key Capability: Organizational view, build relations, establish trust

CHIEF DATA ARCHITECT
Key Capability: Ability to resolve IT escalations

DATA OWNER
By Data Source

Key Capability: Authority to direct changes (data, budget, resources)

APP OWNER
By System / Application

Key Capability: Understand what happens to the data in system and authority to direct changes

DATA STEWARD
By Data Source

Key Capability: Program SME who understands how data are used by decision-makers, cleansing and remediation activities needed

DATA CUSTODIAN
By System / Application

Key Capability: Data Architect or Technology SME to maintain required infrastructure

DATA ANALYSTS (PROGRAM USERS)
Key Capability: Create dashboards and reports required for business use

HHS IT ANALYTICS SUPPORT TEAM
Key Capability: Assist with technologies related to SHARP

Why SHARP?

IDDI: COVID-19 Pandemic

- SHARP was first created as a response to COVID-19 and was originally called Infectious Disease Data Integration (IDDI)
- When COVID-19 hit, DSHS needed expanded data analytics capabilities for real-time decision making

SHARP: Beyond COVID-19

- DSHS realized the benefit of expanded data analytics capabilities
- Technology expanded to include more public health data and was renamed State Health Analytics & Reporting Platform (SHARP)

KEY BENEFITS

Reduced Manual Data Processing	Actionable Insights	Trusted Data & Governance
Ability to automate many current data validation rules and prepare data for reporting	Quickly and efficiently analyze public health trends with enhanced dashboards, reports, and maps	Establish who is authorized to access data, how it should be used, and which legal considerations and established processes apply
Increased Responsiveness	**Data Sharing**	**Expands with Agency Needs**
Field program requests for data or reports more quickly given centralized data repository	Securely share data with Local Health Entities and Public Health Regions and only allow them to access data relevant to their jurisdiction	Add new approved sources of data, as needed; no technological constraints on the amount of data that can be ingested

Understanding SHARP
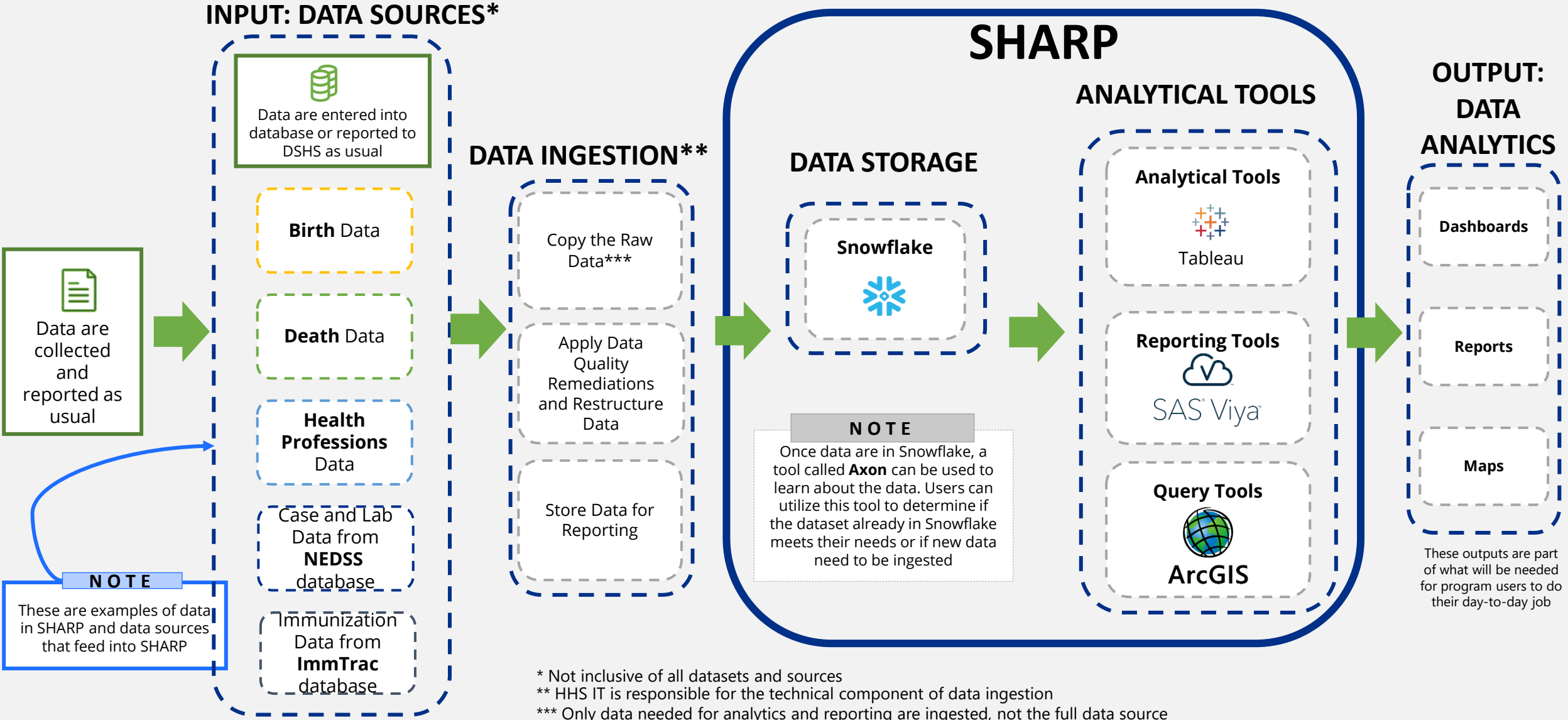
Benefits of SHARP

SHARP benefits a full spectrum of users, from DSHS staff to authorized users at Local Health Entities (LHEs), as it takes care of the manual data processing and data quality checks and prepares data for reporting so users can more efficiently analyze and deliver insights

	PRE-SHARP	**CHANGE**	**POST-SHARP**
Data Usability	• Data are **not uniform** • Data come from multiple sources and are **not easily accessible** for reporting • Data require **manual processing** and data quality checks	• Data are housed in a **central location** • Data are pulled and **processed automatically in regular intervals** • Data quality is performed by the system, with up-to-date **quality reports available**	• **Greater reporting metrics** and analysis capabilities • **Faster turn-around** for ad-hoc reports • Tools enable users to **create their own dashboards** and reports or use **pre-built ones**
Security and Confidentiality	• **Ad hoc** security efforts with on-premise servers and **manual approvals**	• Data are **monitored** by security systems and mechanisms • **Legal statutes** are applied by various data governance efforts	• Data are **less vulnerable** to attacks or leaks • Access is **easier to track** and control • Mechanisms will **prevent unauthorized changes** to the data
Data Governance	• Varied approaches based on program • Minimal, **inconsistent** documentation • **Reliance on institutional knowledge**	• **Central body** to provide oversight and guidance on data governance matters • Data governance **processes built into SHARP adoption** for programs	• Data are **accurate, reliable, compliant, and secure** • Information about data (e.g., definitions, documentation, etc.) in SHARP is **available and accessible**

Successes to Highlight

Texas was first state to develop COVID Lab CSV template
- CDC adapted process and provided guidance to other states for use during COVID

Texas added to the CDC Change Control Board (CCB) for NEDSS

Texas was first to successfully test/ingest COVID variant results in NEDSS (via HL7 and CSV)
- Developed first variant CSV template in the nation

Texas was first state to add a mpox page builder
- Customized page builder was shared by CDC to other states

70+ enhancements and functionalities implemented

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eCR Achievements

Successfully Completed

- eCR live in TX NEDSS since Oct 2022
- Over 237,000+ eCRs processed
- 94 conditions in total authored in RCKMS
- 65 conditions in TX NEDSS production
- COVID eCR completely automated in NEDSS
- 52 Healthcare organizations onboarded
- Over 600 facilities submitting eCR across the state

In Progress

- SHARP incorporation of eCR data for non-infectious DSHS programs
  - 11 Birth Defects conditions- *Production*
  - Pending
    - Environmental epi conditions
    - Newborn screening program
- Expansion of eCR to non-infectious diseases continues

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Successful Expansion of eCR to Non-Infectious Conditions

Recent eCR work expanded to Birth Defects Program

- Routes developed to support ingestion and processing of birth defects conditions
- 11 birth defect conditions for eCR authored
  - Anencephaly
  - Cleft Lip Alone
  - Cleft Lip with Cleft Palate
  - Cleft Palate Alone
  - Down Syndrome
  - Gastroschisis
  - Infant Hearing Loss
  - Limb Reduction
  - Phenylketonuria
  - Primary Congenital Hypothyroidism
  - Spina Bifida

- Texas was the first state in the US to implement eCR for non-infectious conditions
- Birth defects are live in SHARP production
- Pending SHARP Production
  - Environmental/occupational health

NEDSS Interoperability & Functional Improvement (NIFI) Project Updates

In under 2 years, DSHS implemented over 70 new features into TX NEDSS via the NIFI initiative!

- NIFI 1-2 successfully closed out
- NIFI 3 initiating several new functions including improving automation processing, enhancing eCR reporting, and enhancing application performance

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NEDSS Interoperability & Functional Improvement (NIFI) Project Updates

A major achievement included successful integration of NEDSS with ImmTrac2

- Automated bulk vaccination and association for COVID cases
- Interoperability and association for VPD conditions

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Completed Enhancement Highlights

Data Automation Functionality ("*WDS Logic*") Implemented

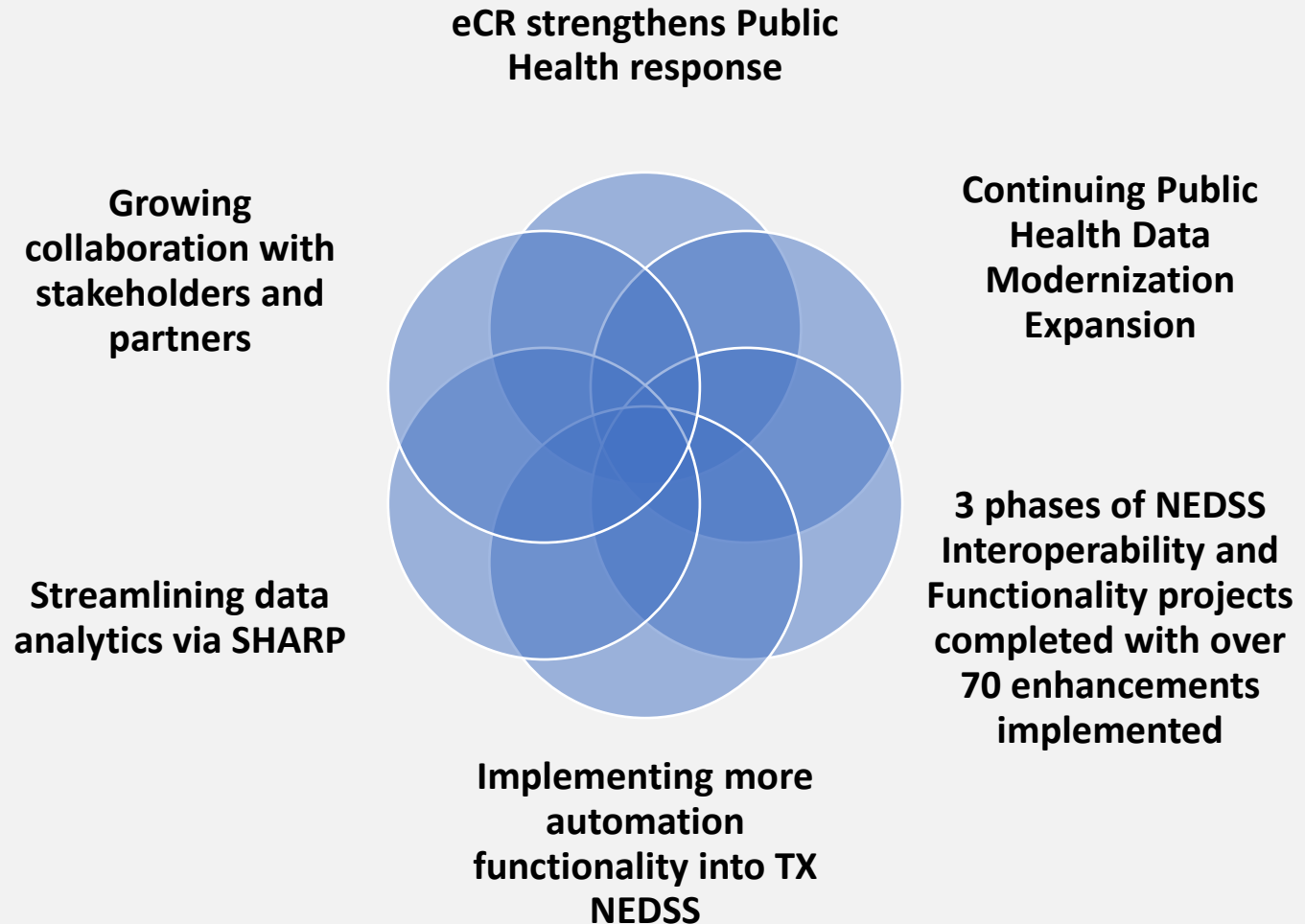**Outbreak Management Module**

Geocoding tool added for ELRs and eCRs

Security Management Module Upgrade

eCR Enhancements
- Expansion of eCR datamart for users, enhanced reports made available
- Archival process implemented for eCRs

Conclusions

eCR strengthens Public Health response

Growing collaboration with stakeholders and partners

Continuing Public Health Data Modernization Expansion

Streamlining data analytics via SHARP

3 phases of NEDSS Interoperability and Functionality projects completed with over 70 enhancements implemented

Implementing more automation functionality into TX NEDSS

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- DSHS Division of Surveillance & Epi (EAIDU/HAI/ZCB)
- DSHS Regional and LHD partners

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Contact Info

- **For questions on eCR registration or onboarding please contact**
  - **TexaseCR@dshs.texas.gov**
- **For questions on ELR, general informatics, or HL7-related questions please contact**
  - **IDI@dshs.Texas.gov**

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