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# PHID Modernization and Enhancement Updates

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# Outline

## NEDSS upgrades done over the last few years

- Several upgrades and patches to NEDSS
- ELR and PHDC Importer improvements

## Completed NEDSS Enhancements

- NIFI (NEDSS Interoperability Functionality Improvements) epics implemented this past year

## Upcoming NEDSS Enhancements over the next couple of months

- Geocoding, FHIR, and WDS enhancements

## Requested future expansion items – Pending CDC approval

- NEDSS UI design, ETL and report upgrades, bulk import functionality on UI

## Ongoing Modernization Projects

- NEDSS new login and portal
- SHARP
- NEDSS training materials



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# NEDSS Upgrades

## Texas went from **last to first**

- March 2020 Texas at bottom compared to other NBS 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*

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

Improved the ELR importer by moving it onto a separate server

- Now can process over **300k ELRs** per day
- No interference with other jobs running



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# Completed NEDSS Enhancements

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# Completed NEDSS Enhancements

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## 1. Page builders added (last 2 years)

- C.auris, pertussis, mumps, Mpox and TB
- Currently working on STD/HIV PHFU pages
- Foodborne/Waterborne conditions are next in line

## 2. Outbreak Management Module – deployed in October 2023

## 3. Security Management Module Upgrade – deployed in September 2023

- For admin only - updated the user management UI format and made it easier to search and add new users

## 4. Integration with ImmTrac

- Bulk vaccine imports (non-covid)
- Vaccine query (single use vaccine search added in NEDSS)



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# Outbreak Management Module



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## Addition of an "Outbreaks" tab in the investigation page

- A new **Outbreaks tab** has been added to Page Builder investigations to display details for associated Outbreaks.
- Users can search and add a patient to an existing outbreak or create a new outbreak and associate the patient to the newly created outbreak

## Addition of an Outbreak queue

- A new queue, "Outbreak Queue" has been added to the "My Queue" widget on the NEDSS Home page
- The users will have the ability to view open outbreaks, search for existing outbreaks, and filter and sort results to find the outbreak of interest

## Auto-generation of Outbreak names

- When creating a new outbreak, the system will automatically assign an outbreak name based on condition, date, jurisdiction, and accession number
- The outbreak name is dynamic and will update if condition, jurisdiction, or date first case became ill are updated

## Outbreak management reports

- Two new reports, "Line List of Outbreaks" and "Line List of Outbreak Contacts", have been created for users to pull data on outbreaks in their jurisdiction and program area

# NEDSS and ImmTrac Integration

- This new functionality provides the user the **ability to access ImmTrac2 from within NEDSS.**
- The query is available in the *Manage Associations* page (shown on the right)

**Associations**  
[Collapse Subsections](#)

Lab Reports

Date Received	Reporting Facility/Provider	Date Collected	Test Results	Program Area	Event ID
Nothing found to display.					

Morbidity Reports

Date Received	Condition	Report Date	Type	Observation ID
Nothing found to display.				

Vaccinations

Date Administered	Vaccine Administered	Vaccination ID
Nothing found to display.		

Treatments

Treatment Date	Treatment	Treatment ID
Nothing found to display.		

Registry Patient ID	Patient Name	Age/DOB/Sex	Race/Ethnicity	Address	Phone	ID	Mother's Name
<a href="#">12345678</a>	Legal Smith, Jane	8 Years Female 07/25/2000	Race White Ethnicity Non-Hispanic	Birth Place Georgia	Home 673-473-6357 Cell 367-374-5623	Social Security 222-22-2222	Legal Smith, Lady

User will then get a search criteria and can select a patient in the search results by clicking on the patient ID (shown on left)

# NEDSS and ImmTrac Integration con't

User can then review and select the vaccination event records to import (shown on left). Events will appear in the vaccination section and supplemental info tab on patient's file in NEDSS (below)

Search Results

Smith, Jane | Female | 07/25/2000 (18 years) Registry Patient ID: 12345678

Results 1 to 3 of 3

<input type="checkbox"/>	Provider	Administration Date	Vaccine Administered	Lot Information	Information Source
<input type="checkbox"/>	Dr. Diana Potts	12/01/2017	Vaccine Type: influenza, seasonal, intradermal, preservative free Dose Number:	Manufacturer: SmithKline Beecham Lot #: 123028 Lot Expiration: 01/01/2022	New Immunization record
<input checked="" type="checkbox"/>	Dr. John Smith	07/27/2011	Vaccine Type: MMR Dose Number: 1	Manufacturer: Merck & Co., Inc. Lot #: 123412 Lot Expiration: 01/01/2022	New immunization record
<input checked="" type="checkbox"/>	Dr. Lisa Santos	12/02/2011	Vaccine Type: MMR Dose Number: 2	Manufacturer: Merck & Co., Inc. Lot #: 123489 Lot Expiration: 01/01/2022	New immunization record

Results 1 to 3 of 3

Import Selected Records Cancel

Associations

Collapse Subsections

Lab Reports

Date Received	Reporting Facility/Provider	Date Collected	Test Results	Program Area	Event ID
<input type="checkbox"/> 11/12/2018 12:00 AM	Reporting Facility: ABERDEEN IMMEDIATE CARE CENTER CROWN POINT	No Date	TEST RESULT TEST Description:	ARBO	OBS10051023GA01

Add Lab Report

Morbidity Reports

Date Received	Condition	Report Date	Type	Observation ID
<input type="checkbox"/> 11/20/2018	Botulism, foodborne	11/20/2018	Initial	OBS10051029GA01

Add Morbidity Report

Vaccinations

Date Administered	Vaccine Administered	Vaccination ID
<input type="checkbox"/> 07/17/1996		INT10047019GA01
<input type="checkbox"/> 11/24/2001	Hep A, ped/adol, 2 dose	INT10047020GA01
<input checked="" type="checkbox"/> 07/26/1996	DTaP-Hep B-IPV	INT10042020GA01

Vaccinations (2)				Add New	Back To Top
Date Created	Provider	Date Administered	Vaccine Administered	Associated With	Event ID
06/10/2018 11:17 PM		No Date	Adenovirus types 4 and 7	CAS10030000GA01 Var_Cond	INT10013000GA01
06/07/2018 12:01 AM		No Date	Adenovirus types 4 and 7	CAS10030000GA01 Var_Cond	INT10012000GA01





# TB Added to NEDSS



Migration project from THISIS to NEDSS for TB/HIV/STD started back in March 2023

TB was the first condition to move over from THISIS

Soft go-live was in Nov. 2023 (data entry of historic cases started)

TB ELRs and WDS were turned on in NEDSS on February 1<sup>st</sup>

LHD and RHD users will officially go-live this weekend!

# STD and HIV Migration into NEDSS



Currently developing the STD investigation pages and WDS algorithms for the ELRs

HIV WDS algorithms are currently being developed

CDC teams are working on building the HIV surveillance page along with planning the process to move away from ehars and into NBS

Projected go-live date is in fall 2024

Data migration will follow



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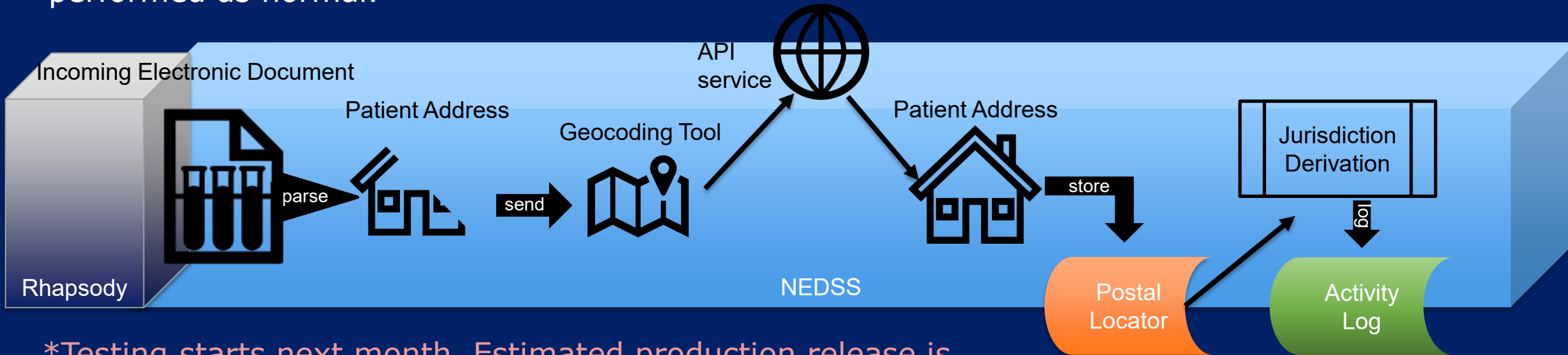
# Upcoming NEDSS Releases

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# Geocoding Tool (Part 1)

The purpose of this geocoding tool in NEDSS will be focused on validating and updating patient addresses for incoming **electronic laboratory reports (ELR)**, **electronic initial case reports (eICR)**, and **electronic case reports (eCR)**.

- The incoming, raw message will be parsed. Then, the parsed patient address will then be geocoded and stored in the existing NEDSS address tables. Jurisdiction derivation will be performed as normal.



\*Testing starts next month. Estimated production release is April 2024\*

# WDS Enhancements for ELRs (Part 1)

**Workflow Decision Support (WDS)** is a functionality that is used to automate 'mark as reviewed' in the DRR queue and create investigation from incoming eICRs, eCRs and ELRs

This functionality was very limited in what could be defined in the WDS algorithms for ELRs

These new enhancements (*listed on next page*) will provide more specificity and expand utility for a wider range of conditions

\*Testing starts this month. Estimated production release is mid **March 2024\***



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# WDS Enhancements for ELRs



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Advanced Lab Criteria Data Element	Example Use Case
<b>Specimen Collection Date</b>	Supports the ability to prevent old labs from creating new investigations by specifying a recent Specimen Collection Date time frame (e.g., apply WDS if the incoming specimen collection date is within [defined timeframe]).
<b>Patient Age/Age Units</b>	Supports the ability to identify congenital/perinatal conditions (e.g., apply WDS if the incoming patient age is within [defined timeframe]).
<b>Patient Current Sex</b>	Adds specificity for disease classification and support prioritization of labs for follow-up based on patient sex (e.g., apply WDS if the incoming patient current sex is [defined patient sex]).
<b>Pregnancy Status</b>	Supports the ability to prioritize and create investigations for pregnant disease cases and to set a default value for pregnancy status within the investigation (e.g., apply WDS if the incoming patient is [pregnant/not pregnant]).
<b>Patient State</b>	Supports the ability to prevent investigations from being created for out-of-state patients (e.g. Mark as review labs where the patient state is not equal to Texas).
<b>Jurisdiction (of ELR)</b>	Supports the ability to customize WDS algorithms based on jurisdiction needs (e.g. for Jurisdiction A Create an Investigation).
<b>Specimen Source</b>	Supports the ability to prevent investigations from being created for non-reportable/low priority conditions (i.e., better case detection).

Another important enhancement is that WDS criteria will **not require a result** (ex. Genetic sequencing and other tests without a defined result) to be added.

# FHIR Survey Administrator

*The **Questionnaire Builder (QB)** and **Survey Administrator (SA)** Applications provide data collection support in the initial stages of a public health investigation involving a large group of people.*

These tools will provide two major services that can serve to automate and speed up the process, as well as increase engagement with the subjects of an investigation:

- 1. Rapid creation of an online survey:** The applications provide a user-friendly tool for creating customized surveys. Investigators can design questionnaires without requiring technical expertise, enabling faster deployment and efficient data collection.
- 2. SMS (Texting) capability:** This allows for aggregate outreach and for subjects of an investigation to engage with the interview via text on their mobile device

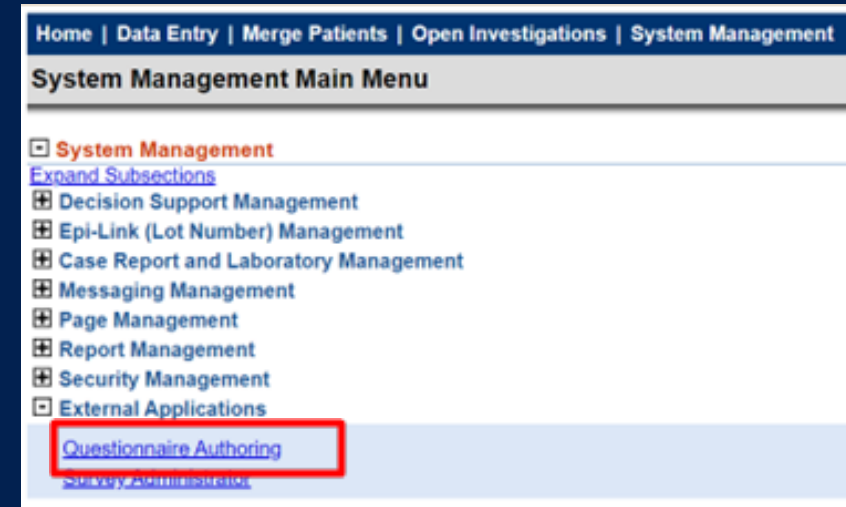
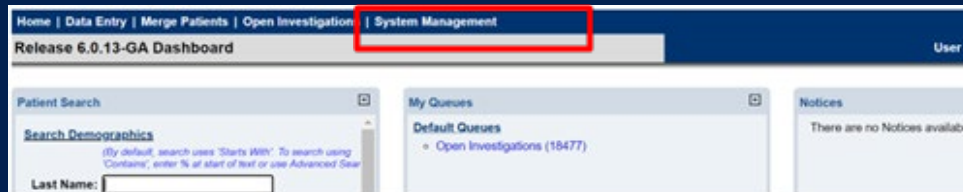


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# FHIR Questionnaire

The questionnaire builder can be launched directly from NEDSS with specific user permission sets:



A new tab will appear in your browser to accept and then you will be brought to the questionnaire



\*Testing starts next month.  
Estimated production release is  
May 2024\*



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# **Future NEDSS Enhancements Requests**

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# Facility/Provider Management Module

## Current Issue

**If a facility comes in with a new/updated address, NEDSS matches the provider based upon IDs in the system, and the ORIGINAL provider record will show in the system, even if the provider contact data is out-of-date or missing.**

*The 'first in wins' – so that the provider data received in 2015 is shown throughout the system even though a newer/better version data for the provider has been received.*

## Received/Created on 10/30/2015

name_txt	Legal DEBORAH B. KELLY, MD
address_txt	Primary Workplace - Office Piedmont Physicians Group
phone_txt	Primary Workplace - Phone (404) 350-6646
id_txt	(National provider identifier) 1790749059
primary_ind_cd	T

## Received/Matched on 10/30/2023

name_txt	Legal DEBORAH B. KELLY, MD
address_txt	Primary Workplace - Office Piedmont Physicians Group 105 Collier Road, NW, Suite 5040 Atlanta, GA 30309  Alternate Workplace - Office 2727 Paces Ferry Road, Suite 1-1100 Atlanta, Georgia 30339
phone_txt	Primary Workplace - Phone (404) 350-6646 Primary Workplace - Fax (404) 350-6647
id_txt	(National provider identifier) 1790749059 (UPIN) G67927 (State license) 60 241396
primary_ind_cd	T

**SOLUTION** - There are different ways to solve this issue. Both are being discussed:

- 1) Always write the address received on an ELR vs. using what is already in the system based upon matching
- 2) Provide a provider/facility 'master registry' to the management module to maintain a facility list.

# Extract, Transform and Load (ETL) Upgrade

## Issues with Current ETL

ETL process is slow, it's manually run by the DBAs, and it continues to miss data in refreshes

Regular complaints of data missing, duplicates and delays with updated data

## Plans to Improve Performance

Modernization efforts at the CDC level are planning to migrate the ETL from SAS server to SQL server

Improvements have been made to the ETL process over the last 2 years; the runtime has improved a bit and 6.0.16 will migrate more SAS code to SQL that will help performance.

NEDSS IT team are working on other ways to improve this with using DMS and other Amazon Services

Early discussions started about the possibility of removing the ETL and reporting database in NEDSS and just push operational data to SHARP for reporting needs.

# Extend Data Marts/Reports

## Current Issue

Regularly get requests to add new fields to multiple reports from various program areas.

- Many fields from the page are missing in basic reports
- Not easy to add these and needs multiple joins done and tested by vendor and PHID
- These requests get placed in the back burner due to the tedious process to create/add

Many label names have long lengths and do not make sense in the condition specific and generic reports

Many legacy fields in the generic reports are NOT used anymore and cause confusion

All depend on the ETL to complete

## Solution

Create dynamic data marts for ALL conditions and labs

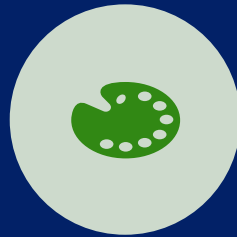
Use the COVID and Mpox Data Marts as a template for providing all the data elements users might want in a report.

Discuss running these on stored procedures and NOT depend on the ETL

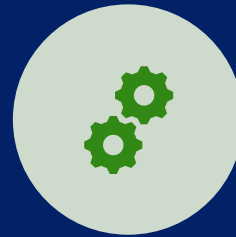
# NEDSS User Interface Upgrade



**UPGRADE THE  
NEDSS UI TO  
'RESKIN' WITH  
EXISTING  
TECHNOLOGY**



**NEW DESIGN  
WILL HAVE A  
MODERNIZED  
LOOK AND FEEL**



**MAINTAIN  
CURRENT  
WORKFLOWS –  
NOT BE A HUGE  
DEPARTURE  
FROM CURRENT  
CORE CODE**

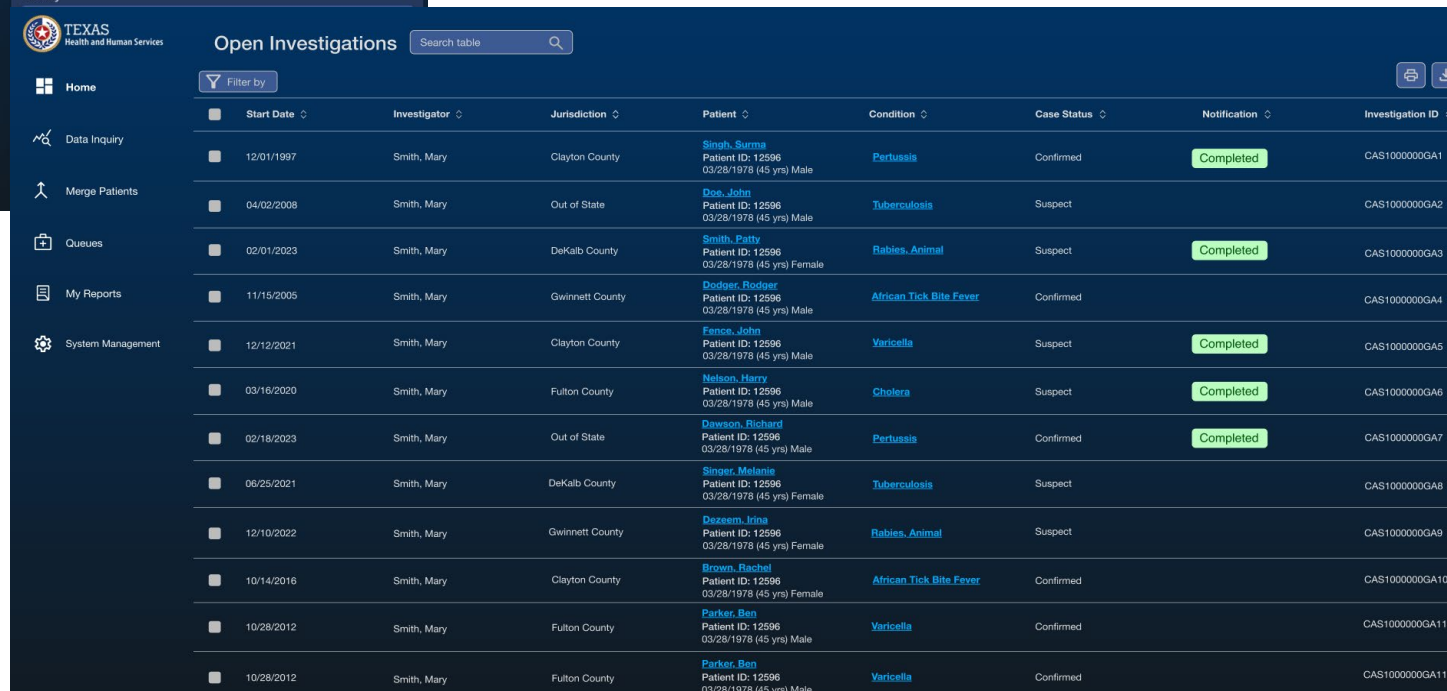
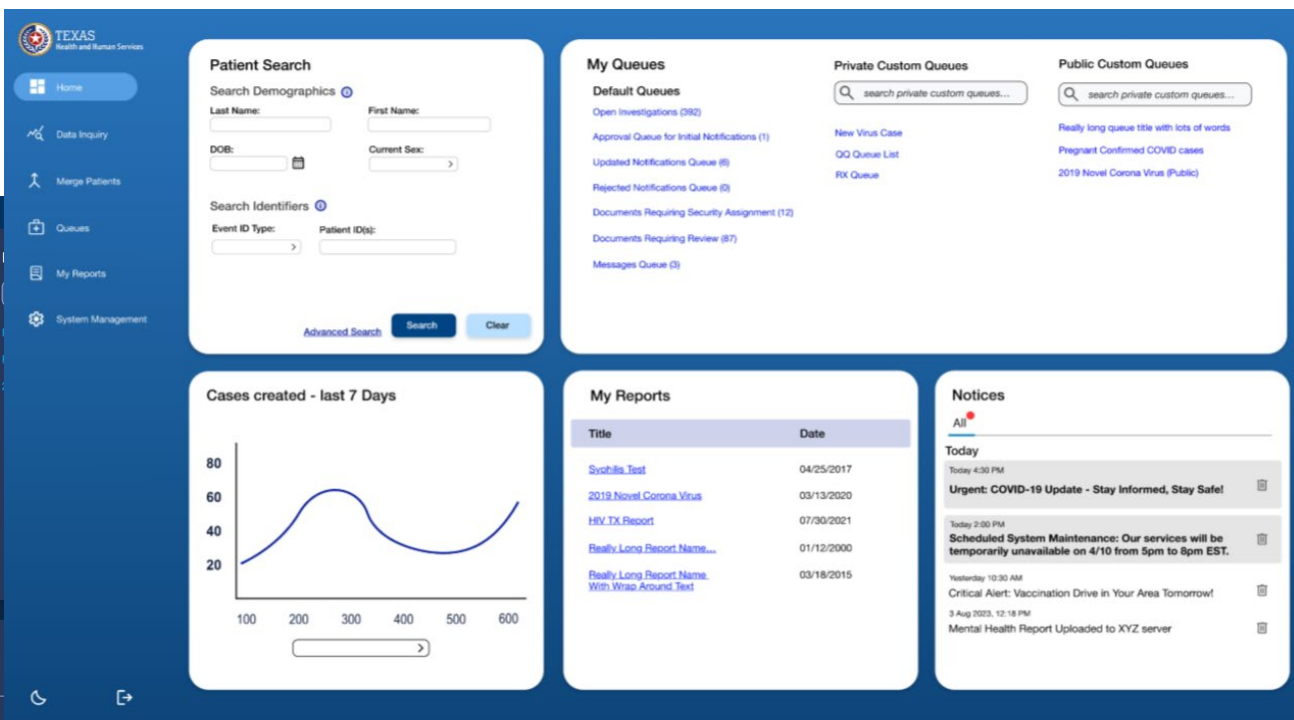


**DISCUSS/CONSIDER  
CUSTOMIZATION  
FOR ALL THE  
MODULES**



**EXPLORE  
MULTIPLE  
OPTIONS AND  
GET FEEDBACK  
FROM EPI STAFF**

# User Interface Mock-ups

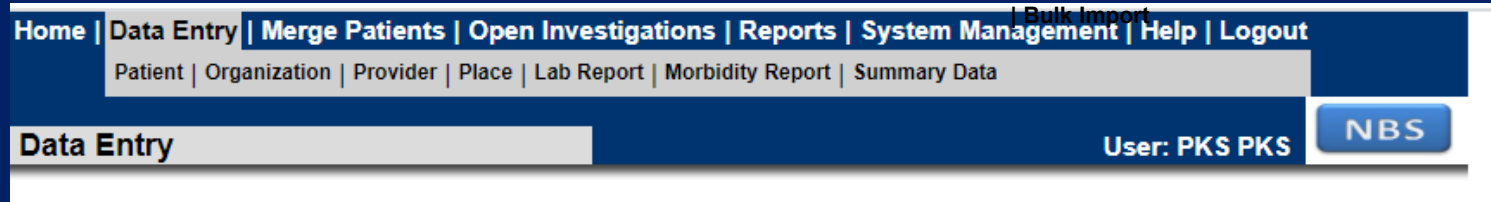
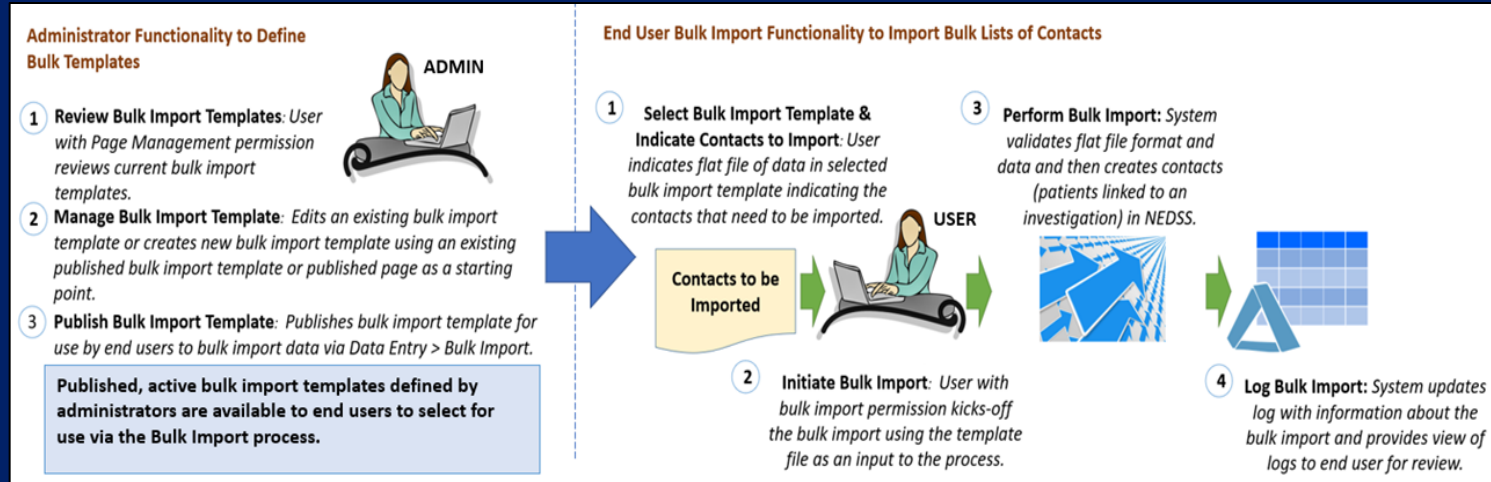


**Dark mode is available and there are many shades that we can decide on before any release.**

# Bulk Import Events on UI (Roster Import)

A Proof of Concept (POC) was originally completed to import contacts in bulk from the UI

Even though this POC focused on Contacts, this function was designed to be extensible for other use cases (e.g., investigations).



For the POC, it was decided to add as a new menu item to Data Entry main menu (Bulk Import).

# Bulk Import Events on UI (Roster Import)

## POC: User Interface for Data Import

The Admin interface is shown with a green 'ADMIN' label. The top navigation bar includes 'Home | Data Entry | Merge Patients | Open Investigations | Reports | System Management'. The 'System Management Main Menu' is expanded to show 'System Management' with a sub-section 'Manage Bulk Import Templates' highlighted in yellow. A red arrow points from this menu item to the 'Manage Bulk Import Templates: Bulk Import Template Library' page. This page shows a table with one entry: 'Contact Record' with 'Template Name' 'TB Contact Bulk Import A151' and 'Template State' 'Published'. A second red arrow points from this entry to the 'Manage Templates: View Bulk Template' page. This page displays details for the 'TB Contact Bulk Import A151' template, including its description, advanced options, and a table of fields with their data fields, mapping types, and mapping options.

Event Type	Template Name	Template State	Related Condition(s)
Contact Record	TB Contact Bulk Import A151	Published	Tuberculosis (2020 RVCT) (102201)

Name	Data Field	Mapping Type	Mapping Options
Investigation Local ID	Investigation Local ID	Override	Required
Administrative Information As of Date	Administrative Information in YYYYMMDD format	Override	Required
Date Named	Date Named	Override	Required
Relationship	Relationship	Override	Required
Last Name	Patient Last Name	Override	Required
Contact Status	Contact Status	Override	Required
Patient Local ID	Patient Local ID	Override	Required
First Name	Patient First Name	Override	Required
Date of Birth	Date of birth in YYYYMMDD format	Override	Required

1. There are two key pieces that need to be implemented for bulk contact import:
  - a. Administrator Functionality to Define Bulk Templates
  - b. End User Bulk Contact Import Functionality to Upload Bulk Lists of Contacts

The End User interface is shown with a green 'END USER' label. The top navigation bar is the same as the Admin interface. The 'Bulk Import' page features a form with a dropdown for '\*Condition:' set to 'Tuberculosis (2020 RVCT)', a dropdown for '\*Template Type:' set to 'TB Contact Bulk Import A151', and a 'Download Template' button. Below the form is a 'Bulk Import Activity Log' section with a 'Results 1 to 5 of 5' indicator.

*Administrators define import templates, and end users access these templates for bulk import from the Data Entry main menu item.*



# Geocoding (Part 2)

Geocoding tool will be added in a couple months, but the second part of developing the geocoding functionality will start this spring



Includes 2 new functions:

1. Assign jurisdiction by latitude and longitude (more accurate jurisdiction assignment) from the ELR, eICR and eCRs

2. Autocomplete patient address when manually entering labs and investigations



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# **Ongoing Modernization Projects**

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# New NEDSS Login Portal

New design and structure

Multi-authentication sign in

Documents link

- Send user to data dictionaries, data entry guidelines, case criteria guides and other important epi documents

SHARP link

- Bring user to the SHARP portal

NEDSS training link

- Send user to the website with all NEDSS trainings

Message area will list any important updates to users



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# SHARP Tools

**SHARP** users can choose the right data analytics tool for their needs then connect the tool to Snowflake to extract the appropriate data, already cleansed and ready to analyze.

## SNOWFLAKE

Snowflake **stores** all SHARP data and is used to query SHARP data using your favorite analytical tool

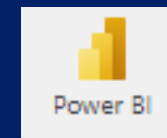


Data Flow



## ANALYTICS TOOLS

These tools filter and analyze public health data from SHARP. They create dashboards and other visual displays consisting of charts, graphs, maps, and more!



**RESOURCES/TRAINING:** <https://www.dshs.texas.gov/sharp-nedss-users>

# SHARP Ongoing Projects



Non-COVID provisional case data from NEDSS (generic case data elements) – ETA April 2024

\*\*Just one table used for the generic case data elements



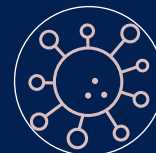
Birth Defects eICR data – ETA February 2024



TB report – *prod date pending*



C. auris report – *prod date pending*



Multiple STD reports – *prod date pending*



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# New NEDSS Training Materials

We are in the process of getting the new basic NEDSS training materials posted – ETA spring 2024

Includes multiple materials:

- Video tutorials
- Quizzes
- NEDSS user guideline/procedure manual
- NEDSS Certification
- Upgrading NEDSS training environment



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A screenshot of a web-based training quiz interface. The page title is "Introduction to NEDSS - Original". The breadcrumb trail shows: Dashboard / Courses / Department of State Health Services Courses / National Electronic Disease Surveillance System (NEDSS) / NEDSS / Step 2: Quiz / NEDSS Training Quiz. The user is identified as Kenzi Guerrero, Student. The quiz contains three questions. Question 1 asks: "All confirmed, probable and suspect cases must contain the following:" with options a. Final Case Status, b. Investigator, c. Investigation Start Date and Assigned Date, d. Report Source Type, e. County/ Jurisdiction, and f. All of the above. Question 2 asks: "An ELR is the electronic transmission of laboratories results that conduct tests for notifiable disease conditions." with options a. True and b. False. Question 3 is partially visible at the bottom.



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# Resources

SHARP training: <https://www.dshs.texas.gov/sharp-nedss-users>

NEDSS documents/guides:  
<https://txnedss.dshs.state.tx.us:8009/login/PHINDox/?action=dox>

Any questions can be sent to me at [Jessica.romano@dshs.texas.gov](mailto:Jessica.romano@dshs.texas.gov)  
Or to the PHID inbox at [IDI@dshs.Texas.gov](mailto:IDI@dshs.Texas.gov)

## QUESTIONS?