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Updates on High Consequence Infectious Diseases

**A Review of Statewide Mpox Cases and New Tools
for Monitoring**



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Mpox in Texas

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Office of the Chief State Epidemiologist

Texas Department of State Health Services

February 16, 2024

Outline

- Current status of the global outbreak of mpox
- Analysis of Texas mpox case data
 - Geographical spread in Texas
 - Trends in sex/gender and race and ethnicity
 - Symptom and lesion data
 - Travel and sexual encounter exposures
 - Key investigation metrics



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Global Mpox Outbreak

Top 5 Countries	Cases
USA	31,567
Brazil	10,967
Spain	7,647
France	4,161
Colombia	4,090

Available at:
<https://www.cdc.gov/poxvirus/mpox/response/2022/world-map.html>,
accessed on December 27, 2023.

Confirmed Cases

92,546

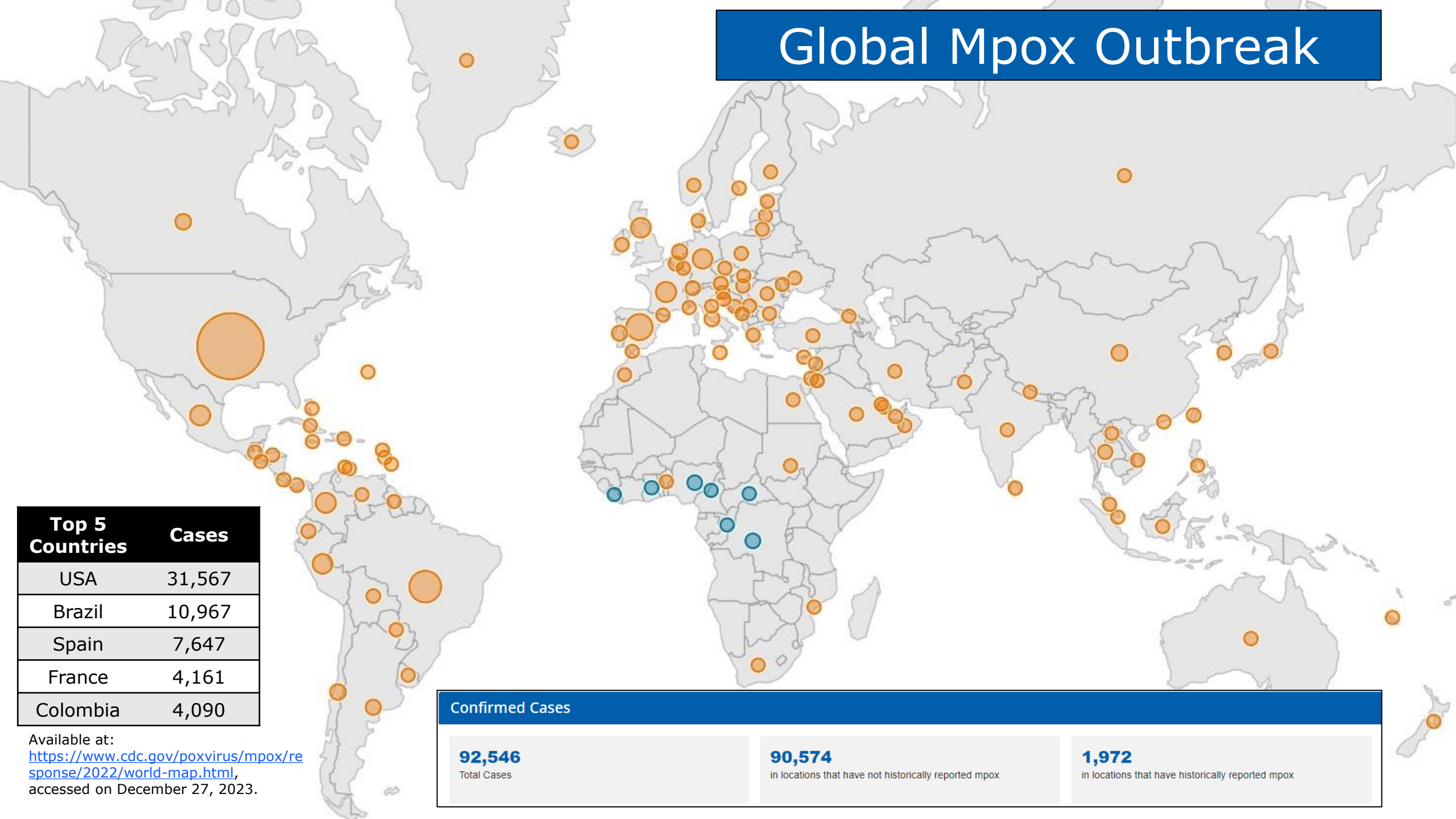
Total Cases

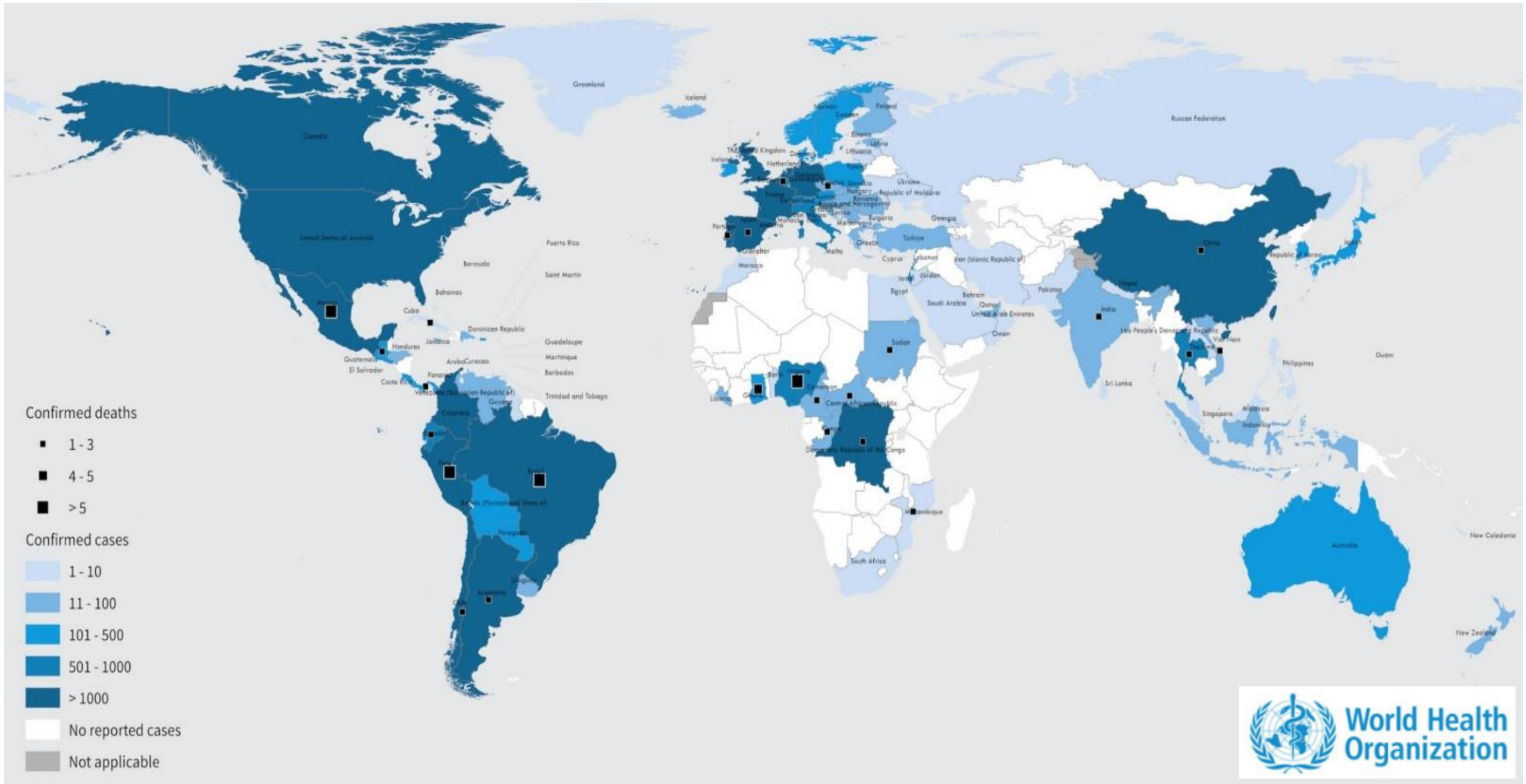
90,574

in locations that have not historically reported mpox

1,972

in locations that have historically reported mpox







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Mpox Global Outbreak

Mpox: Daily confirmed cases

7-day rolling average

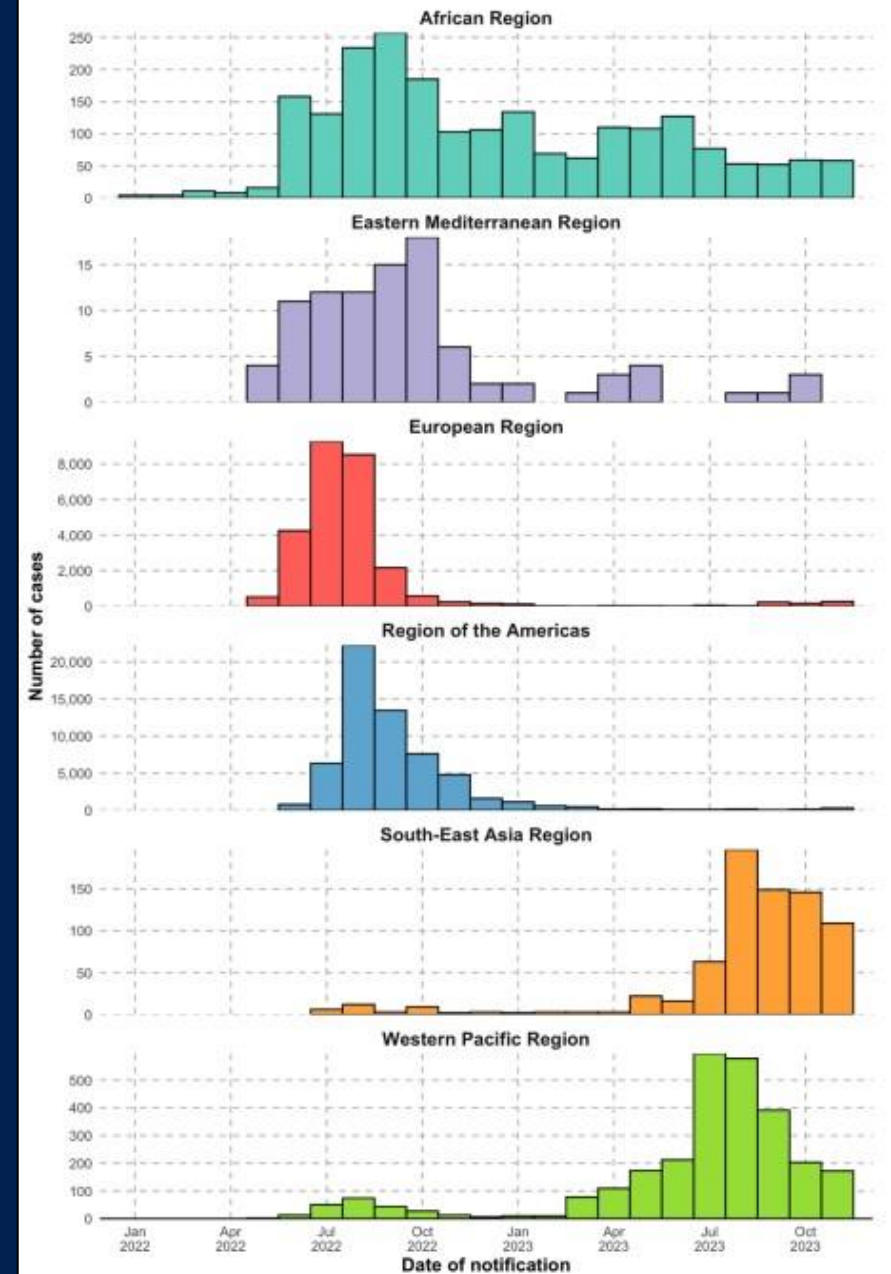
Our World in Data



Data source: World Health Organization

CC BY

Available at: https://ourworldindata.org/explorers/monkeypox?time=earliest..2024-01-20&facet=none&Metric=Confirmed+cases&Frequency=7-day+average&Relative+to+population=false&country=~OWID_WRL, accessed on January 20, 2024.



Available at: <https://www.who.int/publications/m/item/multi-country-outbreak-of-mpox--external-situation-report-31---22-december-2023>, accessed on November 30, 2023.

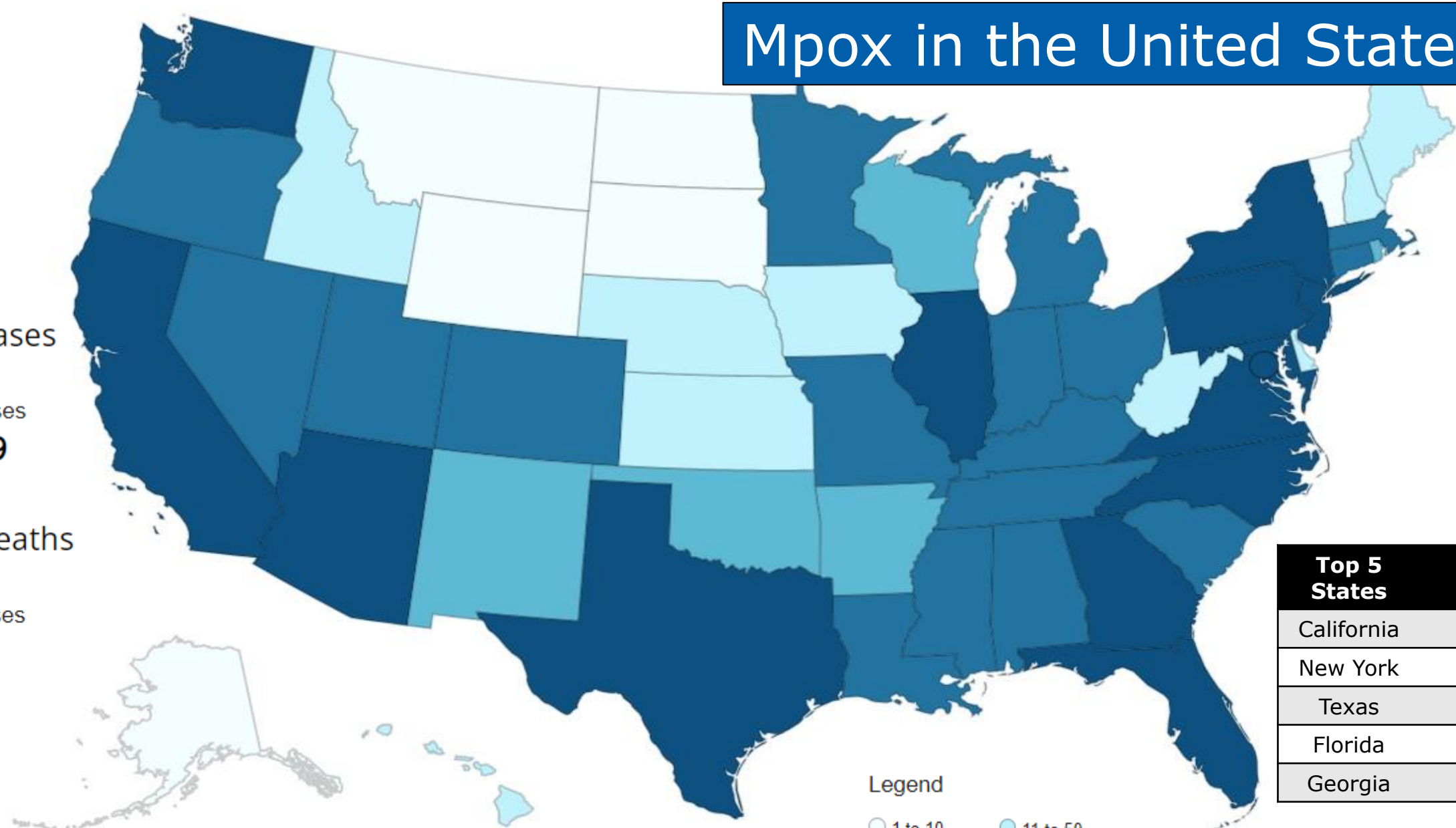
Mpox in the United States

U.S. Cases

Total Cases
31,689

U.S. Deaths

Total Cases
56



Top 5 States	Cases
California	6,114
New York	4,448
Texas	3,136
Florida	2,957
Georgia	2,047

Legend

- 1 to 10
- 11 to 50
- 51 to 100
- 101 to 500
- >500

Territories



Available at: <https://www.cdc.gov/poxvirus/mpox/response/2022/us-map.html>, accessed on January 11, 2024.



Mpox in the United States



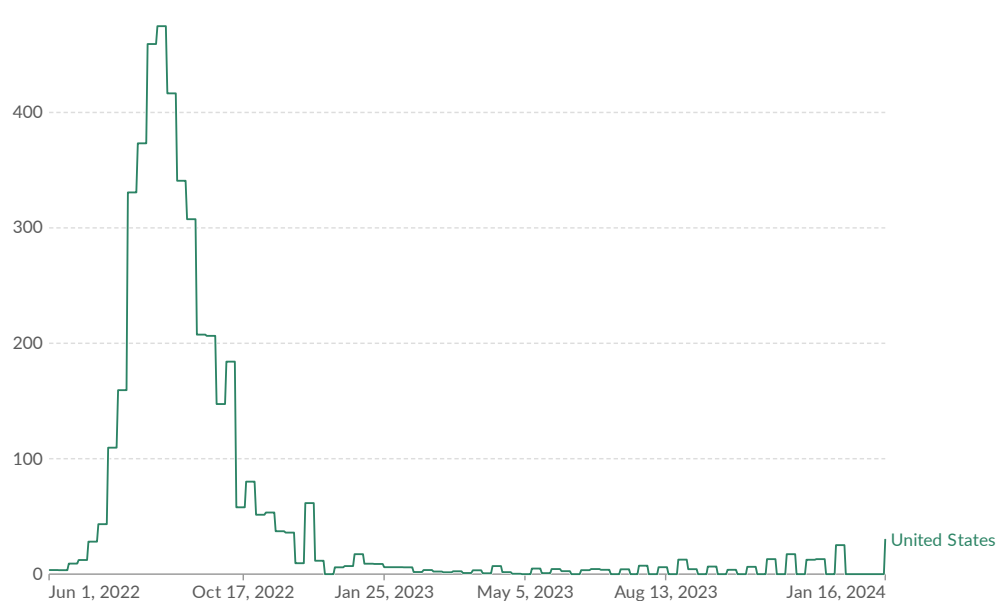
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Mpox: Daily confirmed cases

7-day rolling average



Data source: World Health Organization

Our World in Data

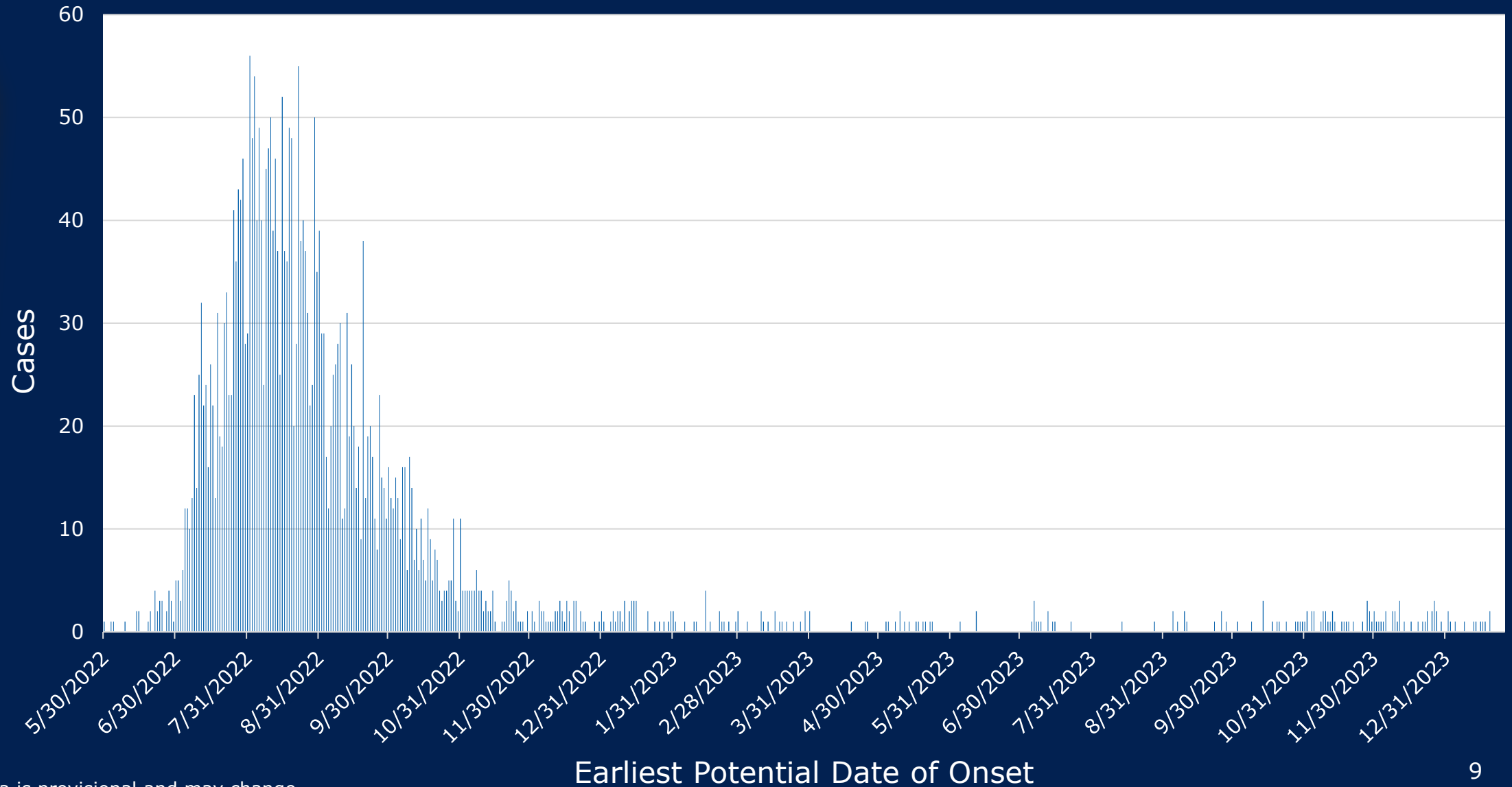
CC BY

Top 10 States*	Cases	Rate (per 100,000)
District of Columbia	556	82.76
New York	4,448	22.60
Georgia	2,047	18.76
California	6,114	15.67
Florida	2,957	13.29
Illinois	1,569	12.47
Maryland	759	12.31
Nevada	339	10.67
Texas	3,136	10.44
Washington	734	9.43

Available at: https://ourworldindata.org/explorers/monkeypox?time=earliest..2024-01-20&facet=none&Metric=Confirmed+cases&Frequency=7-day+average&Relative+to+population=false&country=~OWID_WRL, accessed on January 20, 2024.

Available at: <https://www.cdc.gov/poxvirus/mpox/response/2022/us-map.html>, accessed on January 11, 2024.

Daily Mpox Cases by Earliest Potential Date of Onset Texas 5/29/2022 - 1/25/2024*



*Data is provisional and may change.



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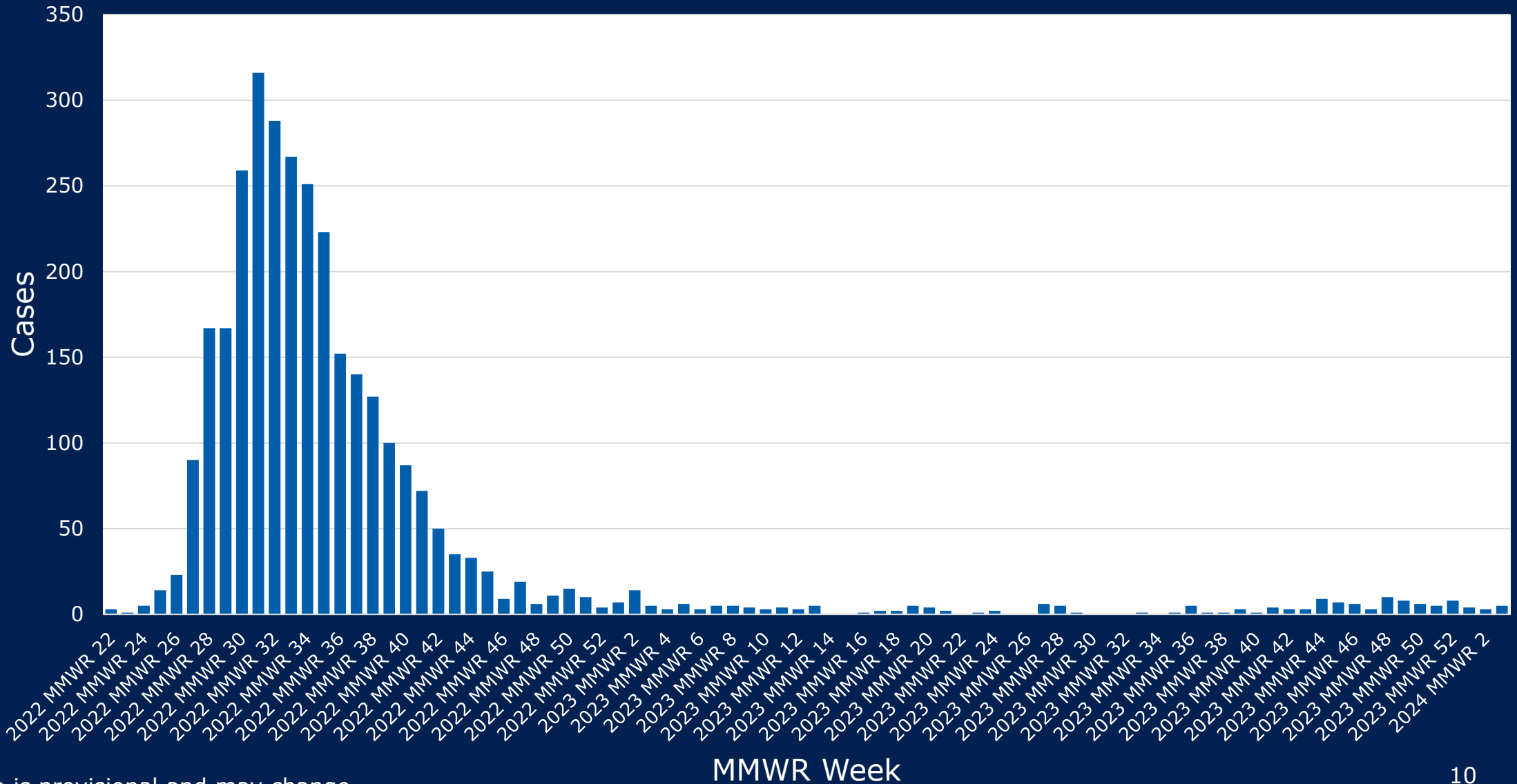
Weekly Mpox Cases by Earliest Potential Date of Onset Texas 5/29/2022 - 1/25/2024*



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*Data is provisional and may change.

Texas Mpox Cases by County

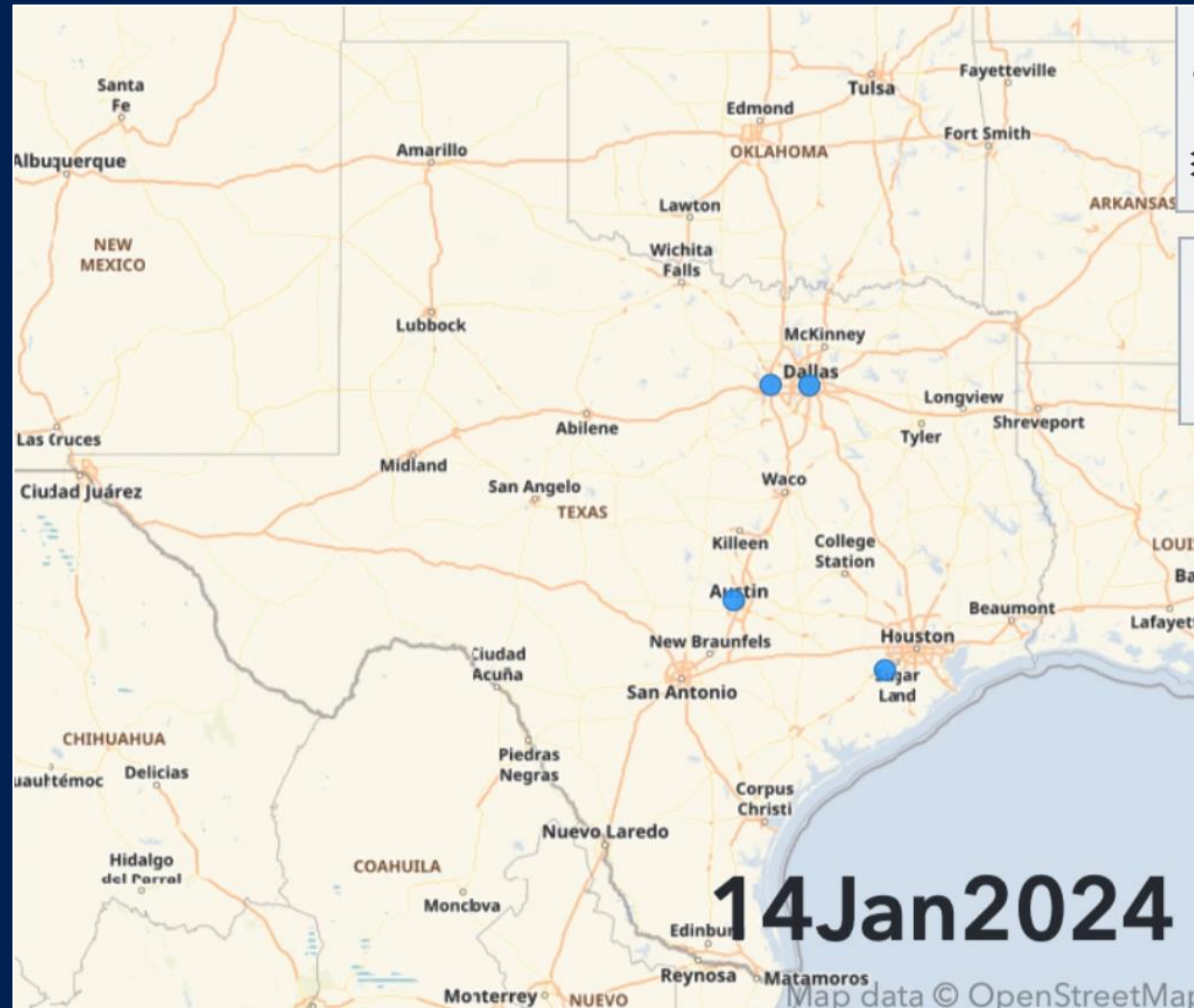
5/29/2022 to 1/25/2024*



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*Data is provisional and may change.

Texas Mpox Cases by Sex and PHR

5/29/2022 to 1/25/2024*



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Public Health Region	Male		Female		Total	
	n	% (column)	n	% (column)	n	% (column)
PHR 1	10	0.3%	Suppressed			
PHR 2/3	1,333	43.5%	31	31.6%	1,364	43.2%
PHR 4/5N	10	0.3%	Suppressed			
PHR 6/5S	1,067	34.8%	46	46.9%	1,113	35.2%
PHR 7	396	12.9%	10	10.2%	406	12.8%
PHR 8	212	6.9%	6	6.1%	218	6.9%
PHR 9/10	12	0.4%	Suppressed			
PHR 11	23	0.8%	Suppressed			

*Data is provisional and may change. Data excludes 4 cases with unknown sex

Texas Mpox Cases by Sex and Age

5/29/2022 to 1/25/2024*



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Age (Years)	Male		Female		Total	
	n	% (column)	n	% (column)	N	% (column)
<18 Years	15	0.5%	Suppressed			
18-29 Years	861	28.1%	49	50.0%	910	28.8%
30-39 Years	1,297	42.3%	27	27.6%	1,324	41.9%
40-49 Years	586	19.1%	11	11.2%	597	18.9%
50-59 Years	257	8.4%	8	8.2%	265	8.4%
60+ Years	47	1.5%	Suppressed			
Mean	35		31		35	
Median	33		29		33	
Range	0 to 75		6 to 59		0 to 75	

*Data is provisional and may change. Data excludes 4 cases with unknown sex.

Female Mpox Cases by MMWR Week

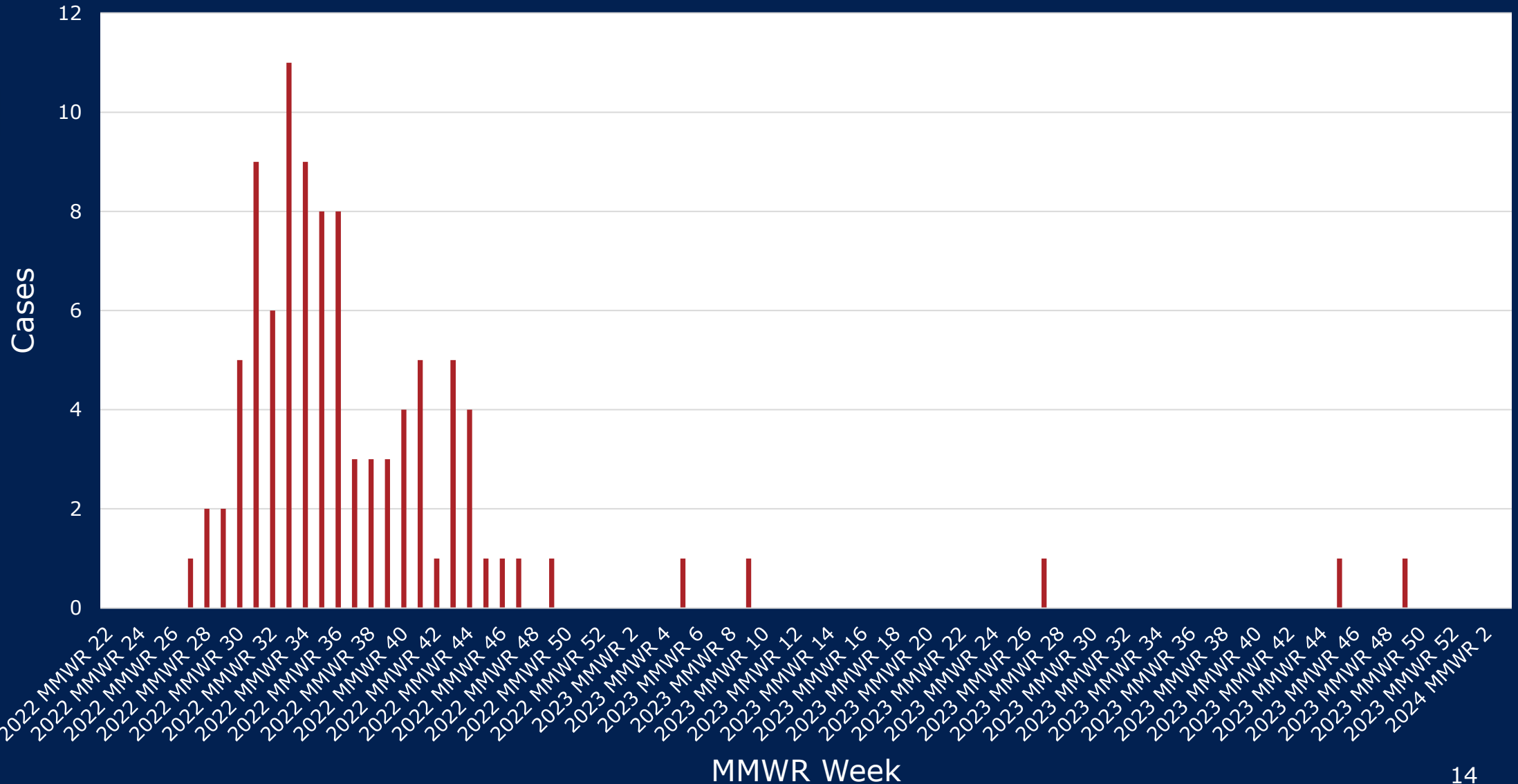
Texas 5/29/2022 - 1/25/2024*



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*Data is provisional and may change.

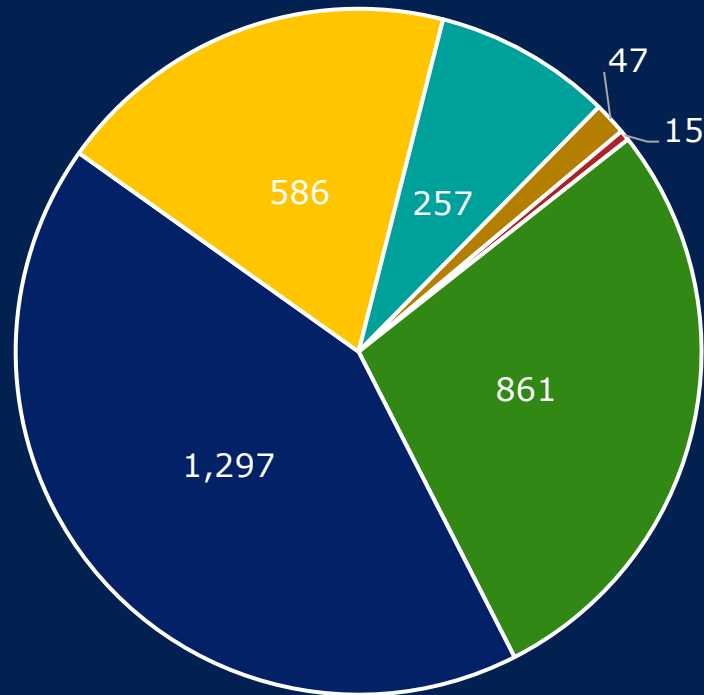
Age Categories by Sex

5/29/2022 to 1/25/2024*



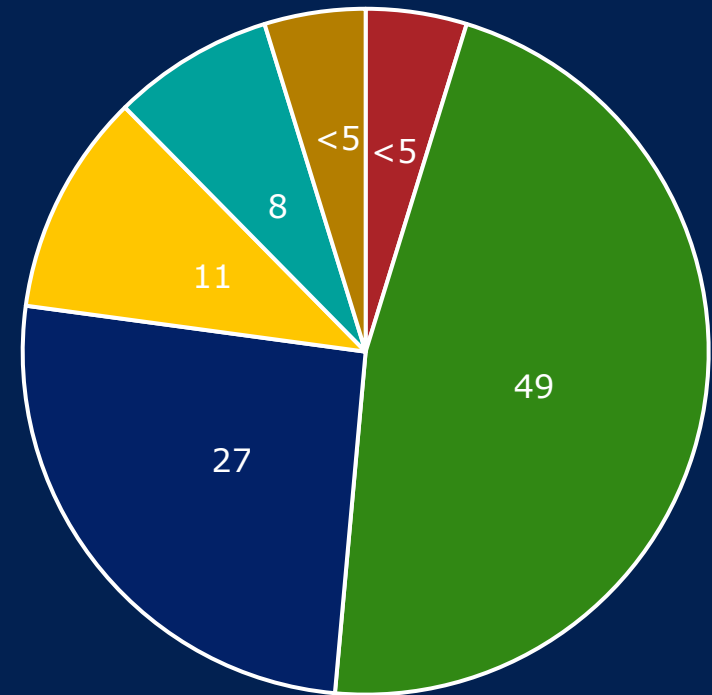
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Males Only
n=3,063



■ <18 Years
 ■ 18-29 Years
 ■ 30-39 Years
■ 40-49 Years
 ■ 50-59 Years
 ■ 60+ Years

Females^
n=98



■ <18 Years
 ■ 18-29 Years
 ■ 30-39 Years
■ 40-49 Years
 ■ 50-59 Years
 ■ 60+ Years

*Data is provisional and may change.

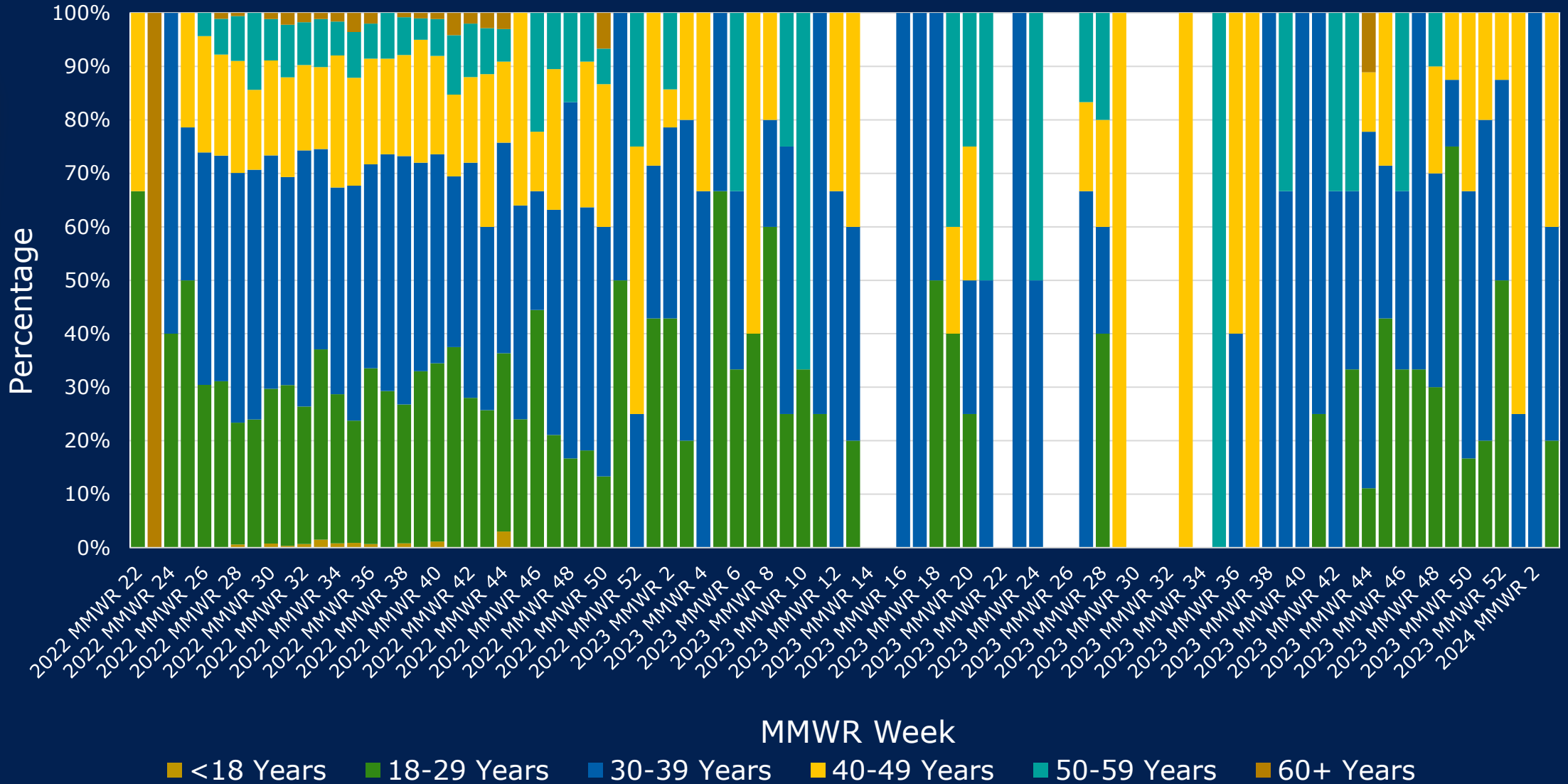
^Chart has been adapted to suppress counts <5.

Proportion of Age Categories by MMWR Week

Texas 5/29/2022 - 1/25/2024*



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*Data is provisional and may change.

Race and Ethnicity by Sex 5/29/2022 to 1/25/2024*

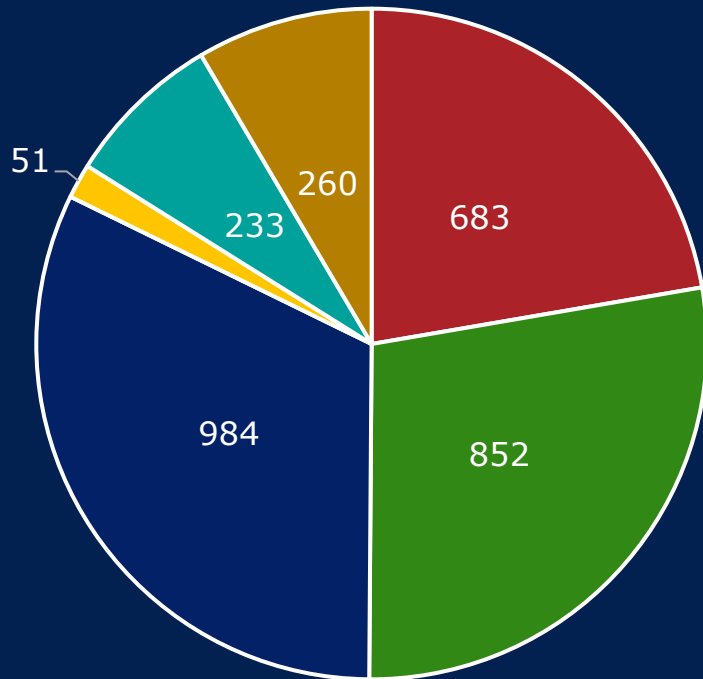


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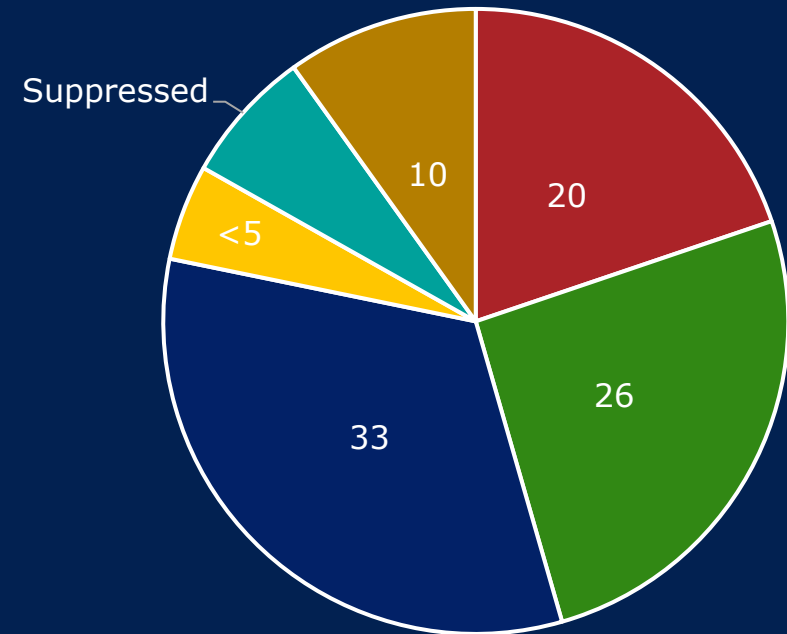
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Males
n=3,063



- White
- Black or African American
- Hispanic or Latino
- Asian
- Other
- Unknown

Females^
n=98



- White
- Black or African American
- Hispanic or Latino
- Asian
- Other
- Unknown

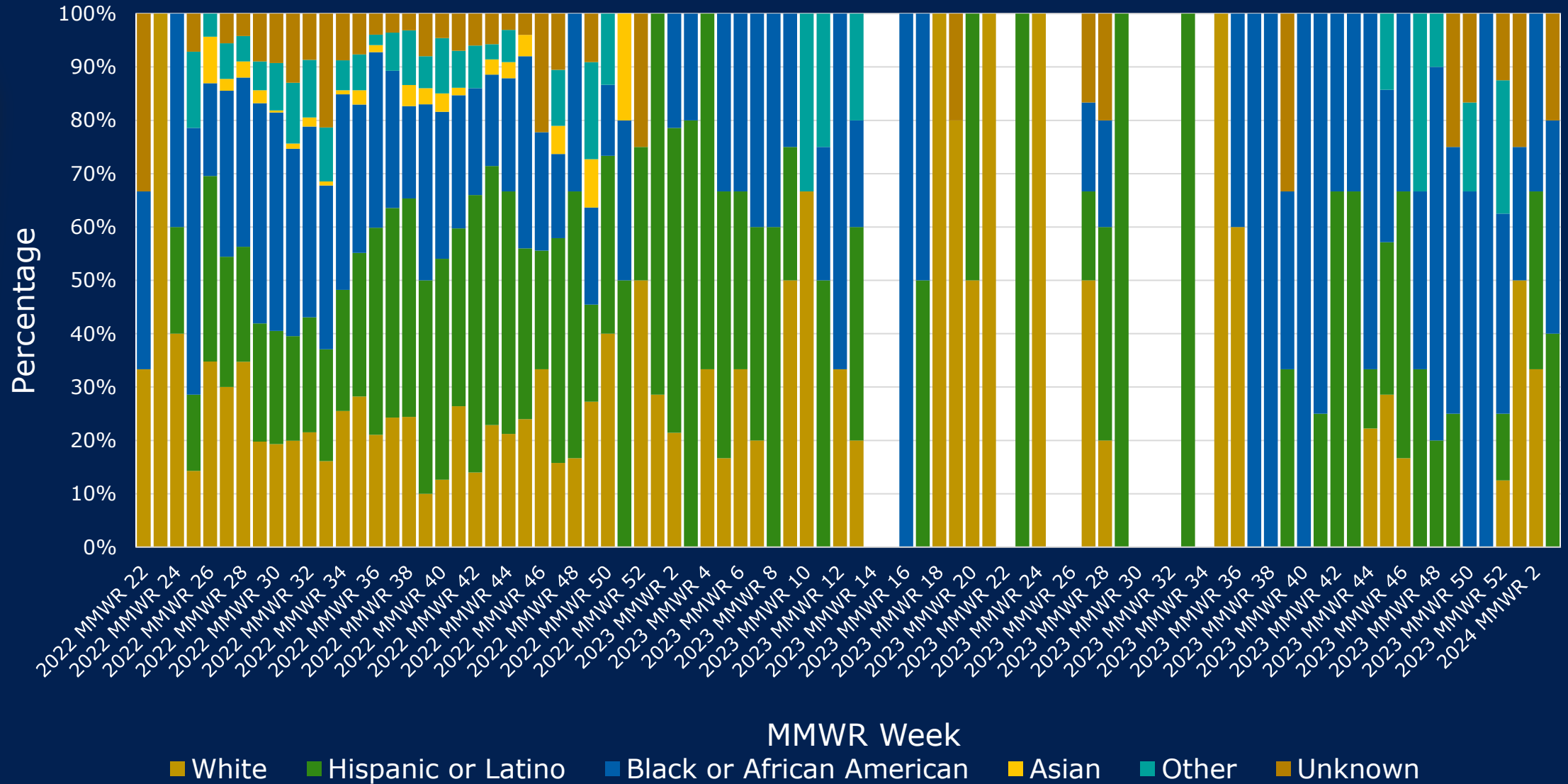
*Data is provisional and may change.

^Chart has been adapted to suppress counts <5.

Proportion of Race and Ethnicity by MMWR Week Texas 5/29/2022 - 1/25/2024*



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*Data is provisional and may change.

Texas Mpox Cases by Sex and Hospitalization 5/29/2022 to 1/25/2024*



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	Male		Female		Total	
Hospitalized?	n	% (column)	n	% (column)	n	% (column)
Yes	173	5.6%	12	12.2%	185	5.9%
No	2,132	69.6%	65	66.3%	2,197	69.5%
Unknown	758	24.7%	21	21.4%	779	24.6%

*Data is provisional and may change. Data excludes 4 cases with unknown sex.

Texas Mpox Cases by Sex and Immune Status

5/29/2022 to 1/25/2024



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Immunocompromised?	Male		Female		Total	
	n	% (column)	n	% (column)	n	% (column)
Yes	573	18.7%	7	7.1%	580	18.3%
No	1,472	48.1%	63	64.3%	1,535	48.6%
Unknown	1,018	33.2%	28	28.6%	1,046	33.1%

Data excludes 4 cases with unknown sex

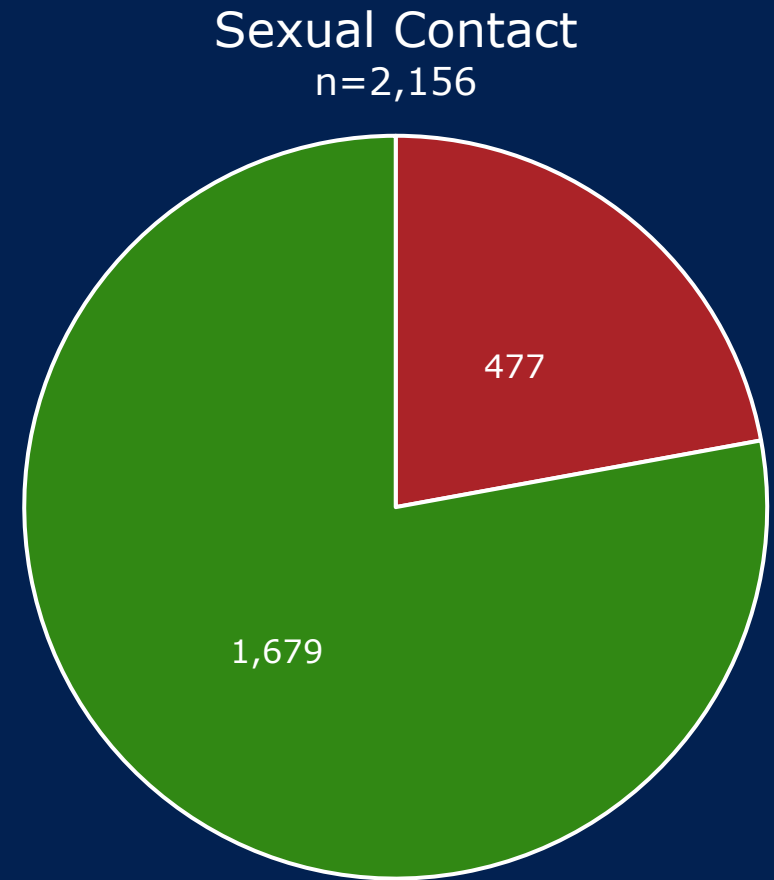
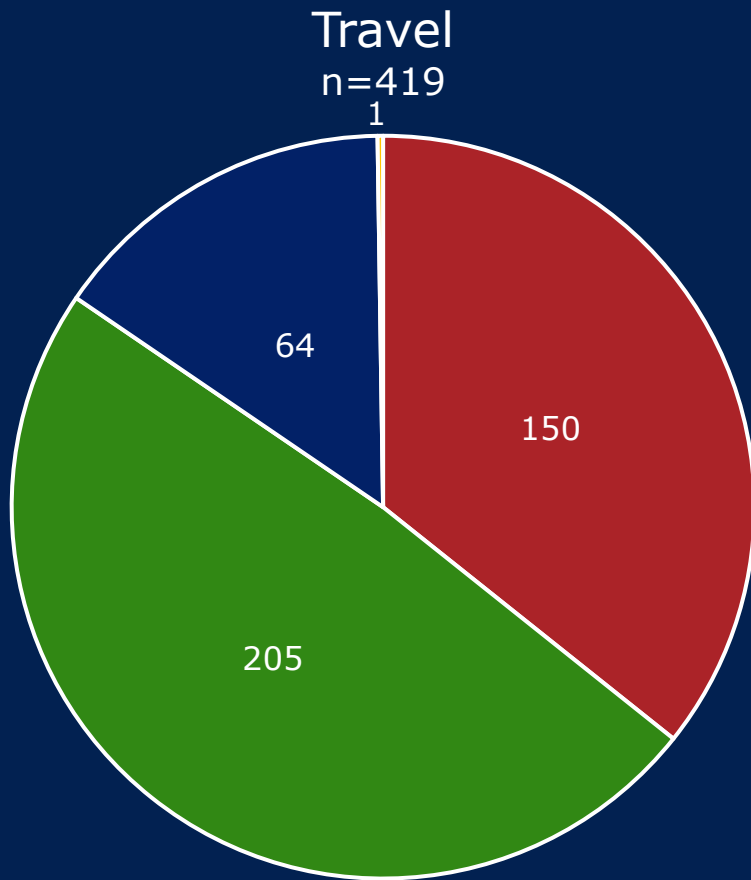
Epidemiological Risk Factors 5/29/2022 to 1/25/2024*



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■ In-State ■ Domestic □ Foreign ■ Unknown

■ No ■ Yes

*Data is provisional and may change.

Types of Sexual Encounters by Sex 5/29/2022 to 1/25/2024**

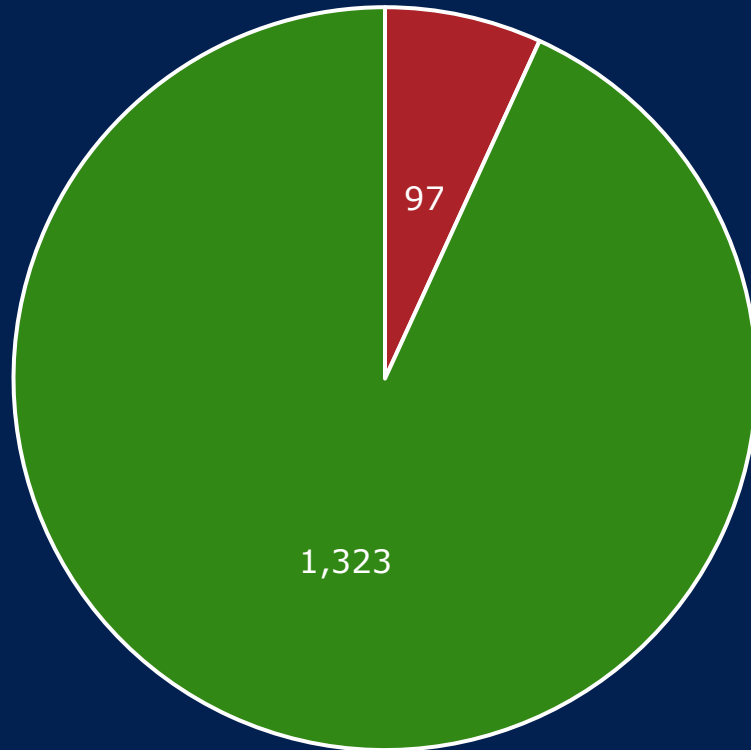


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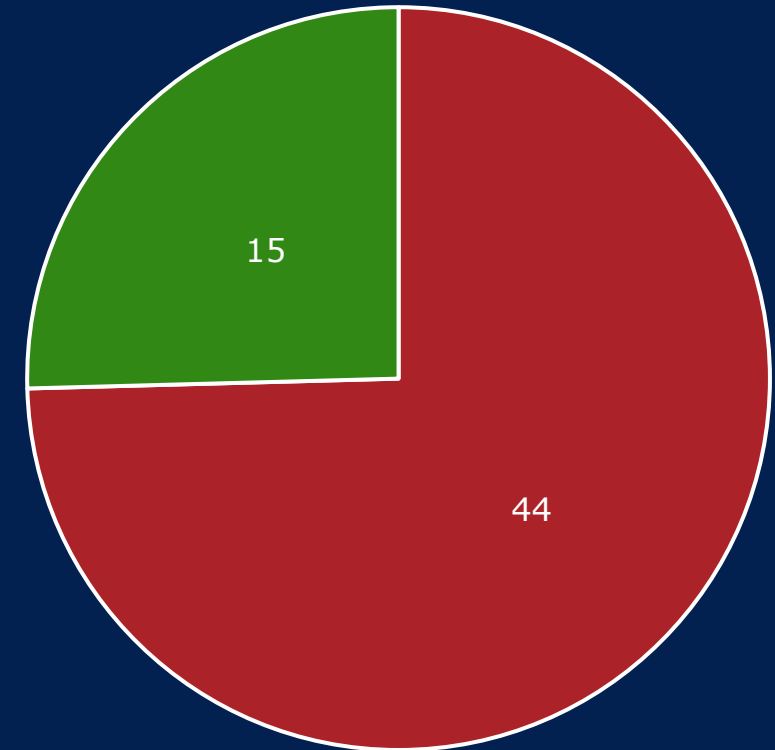
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Males Only
n=1,420



■ MSW ■ MSM*

Females Only
n=59



■ WSM ■ WSW^

*MSM includes men who have sex with men, men who have sex with non-binary individuals, and others.

**Data is provisional and may change. Data excludes 4 cases with unknown sex.

^WSW includes women who have sex with women, women who have sex with non-binary individuals, and others

Percentage of Symptoms by Sex 5/29/2022 to 1/25/2024*

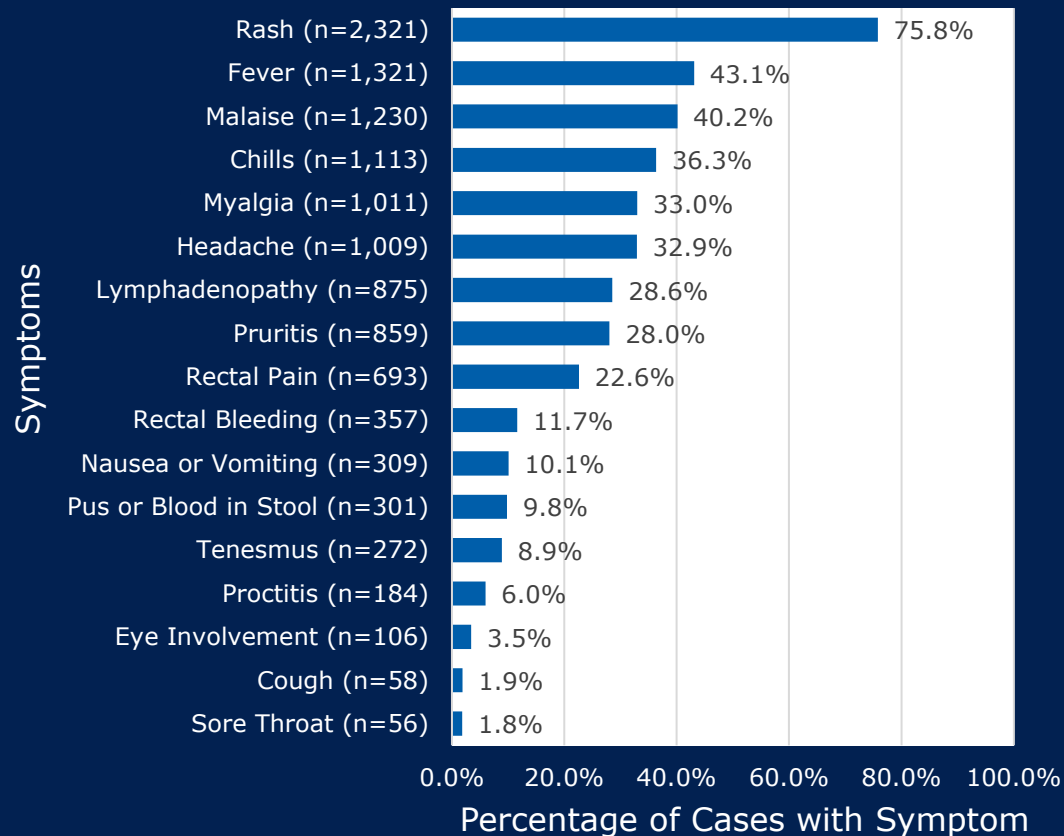


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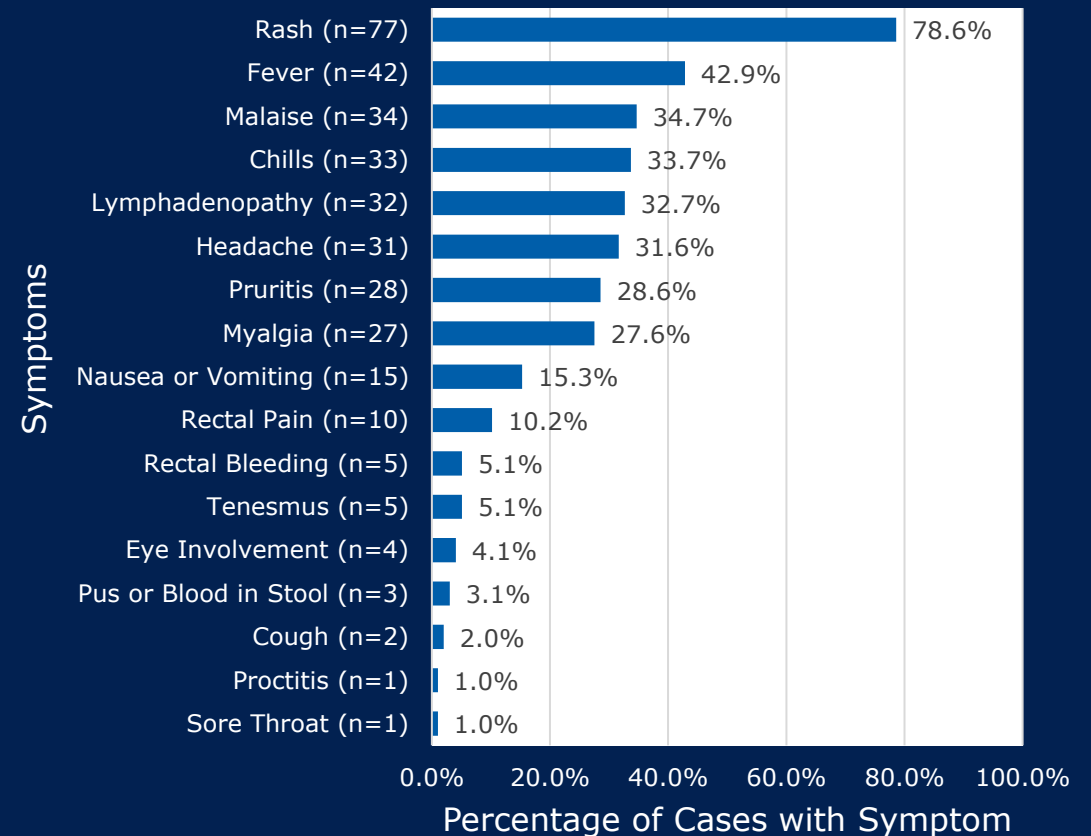
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Males Only
n=3,063



Females Only
n=98



*Data is provisional and may change. Data excludes 4 cases with unknown sex.

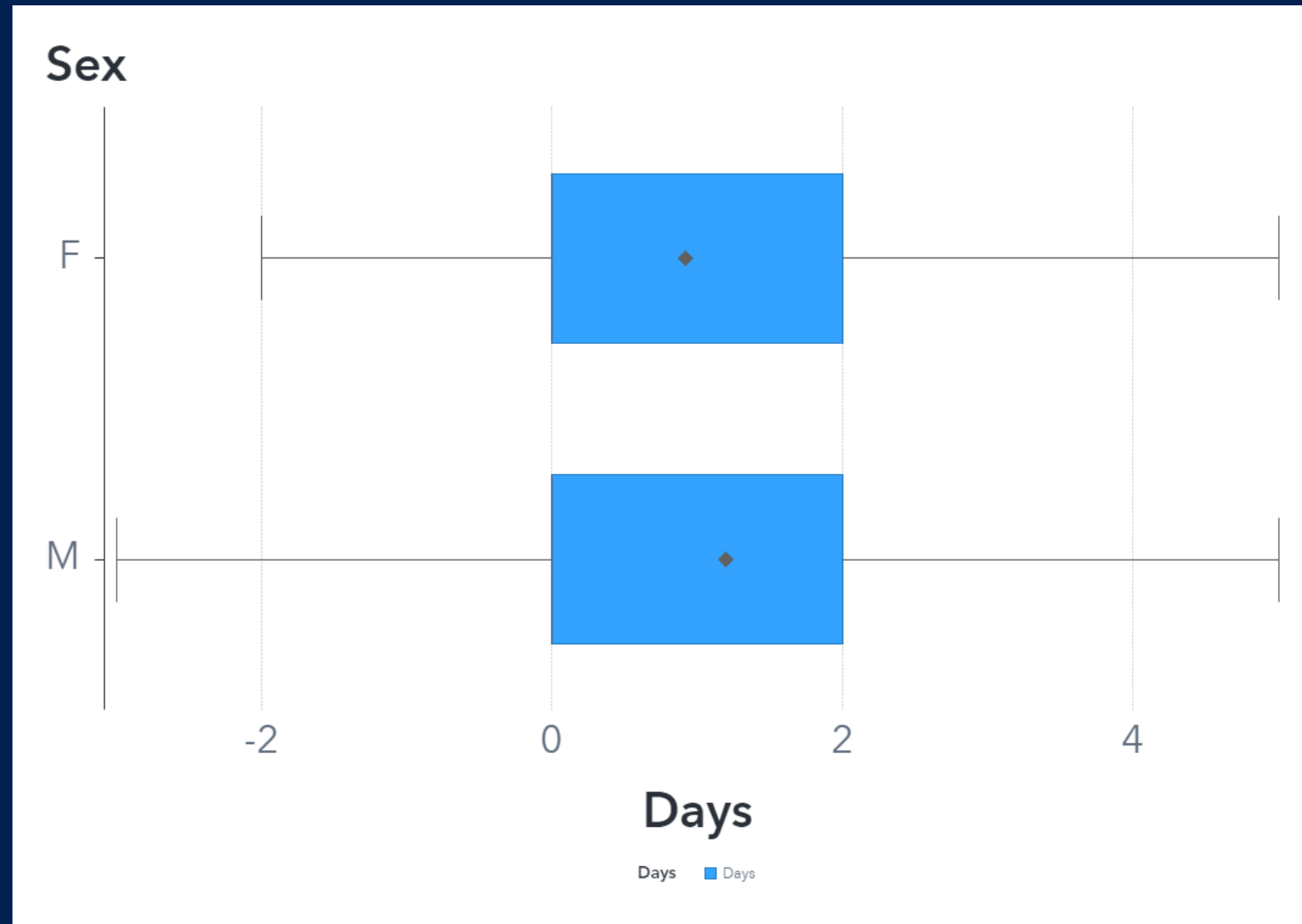
Days from Symptom Onset to Rash Presentation 5/29/2022 to 1/25/2024*



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*Data is provisional and may change. Data excludes 4 cases with unknown sex.

Percentage of Lesion Locations by Sex 5/29/2022 to 1/25/2024*

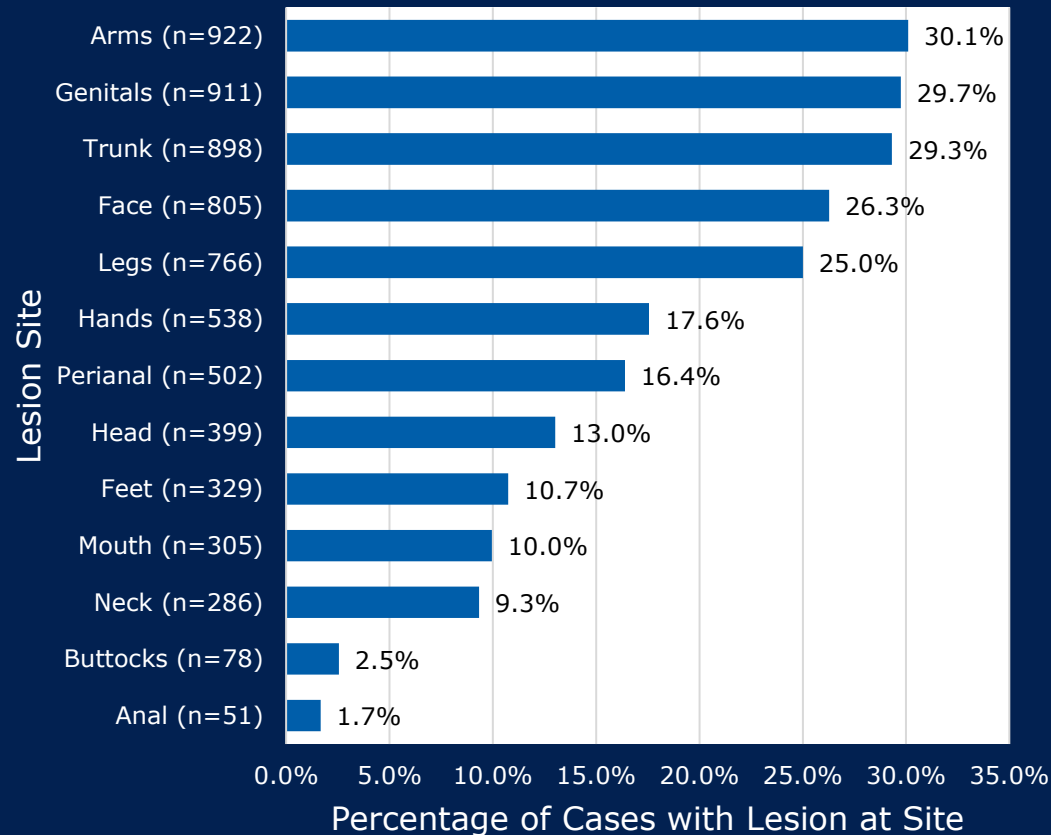


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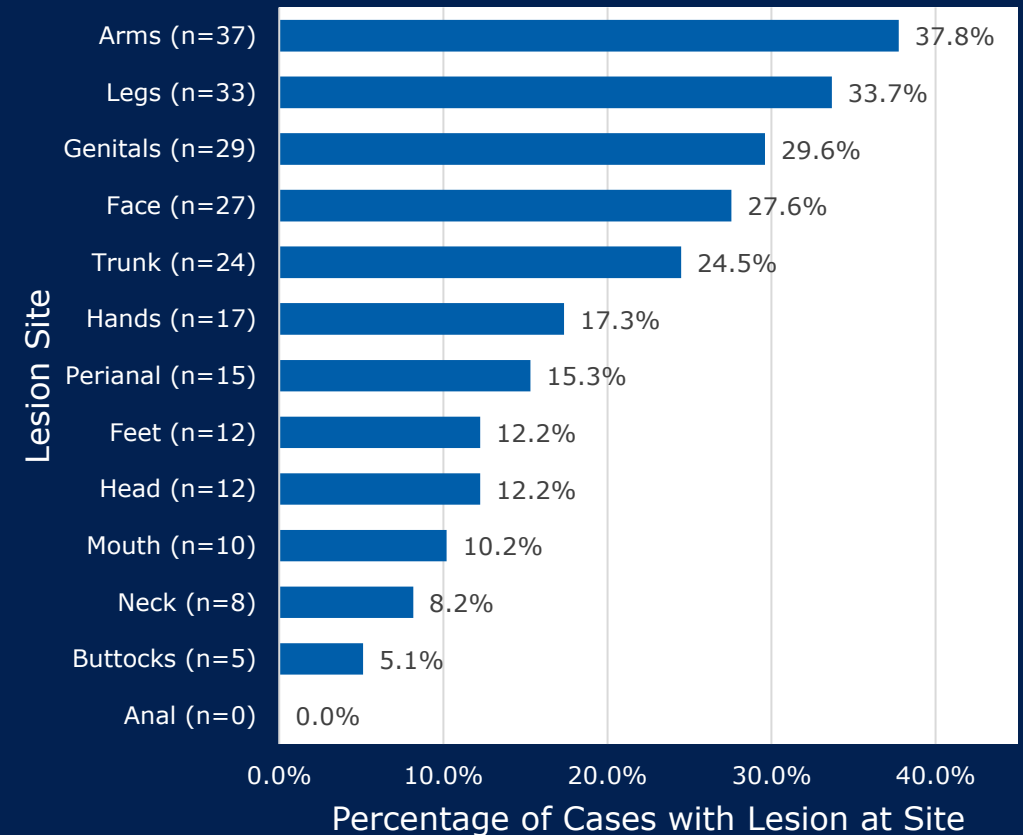
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Males Only
n=3,063



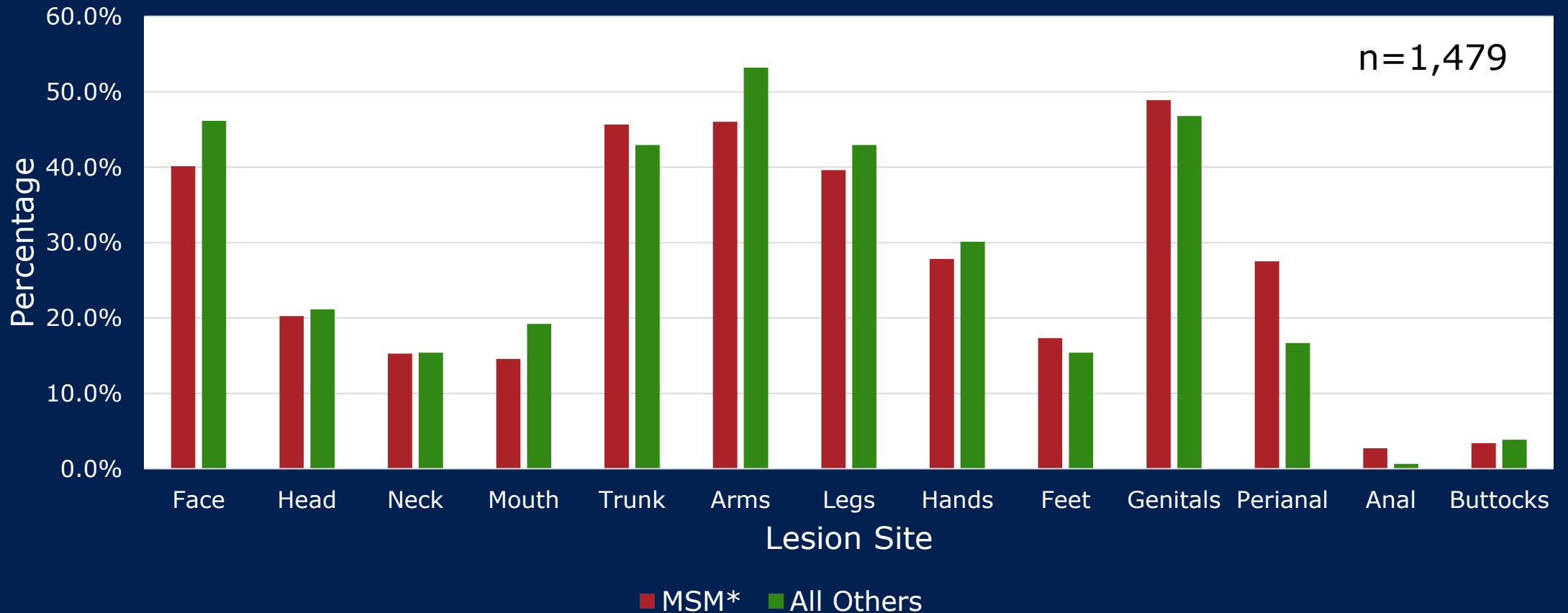
Females Only
n=98



*Data is provisional and may change. Data excludes 4 cases with unknown sex.

Location of Mpox Lesions Among MSM and All Others Texas

5/29/2022 - 1/25/2024**



*MSM includes men who have sex with men, men who have sex with non-binary individuals, and others.

**Data is provisional and may change. Data excludes 4 cases with unknown sex.



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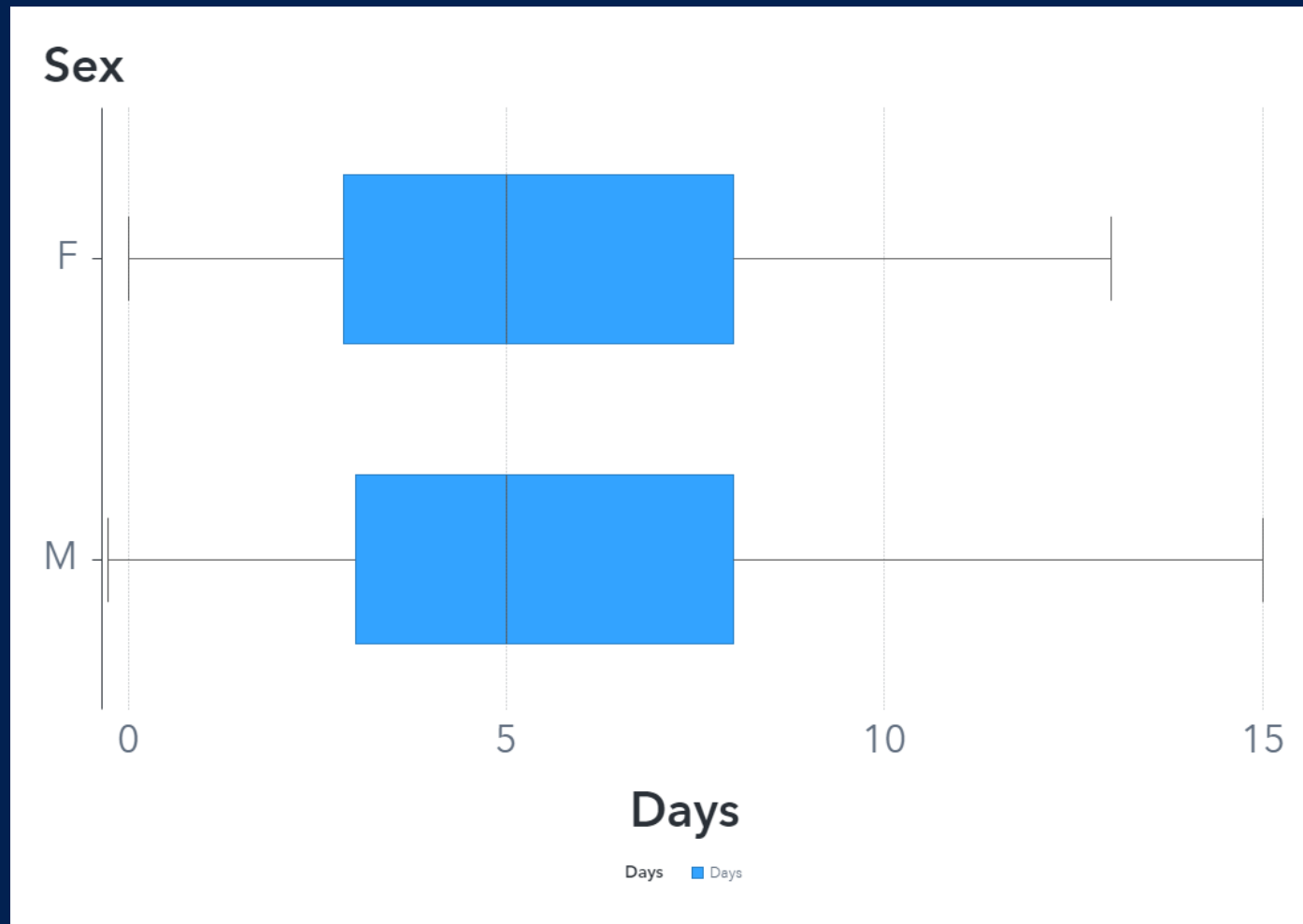
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Days from Symptom Onset to Specimen Collection 5/29/2022 to 1/25/2024*



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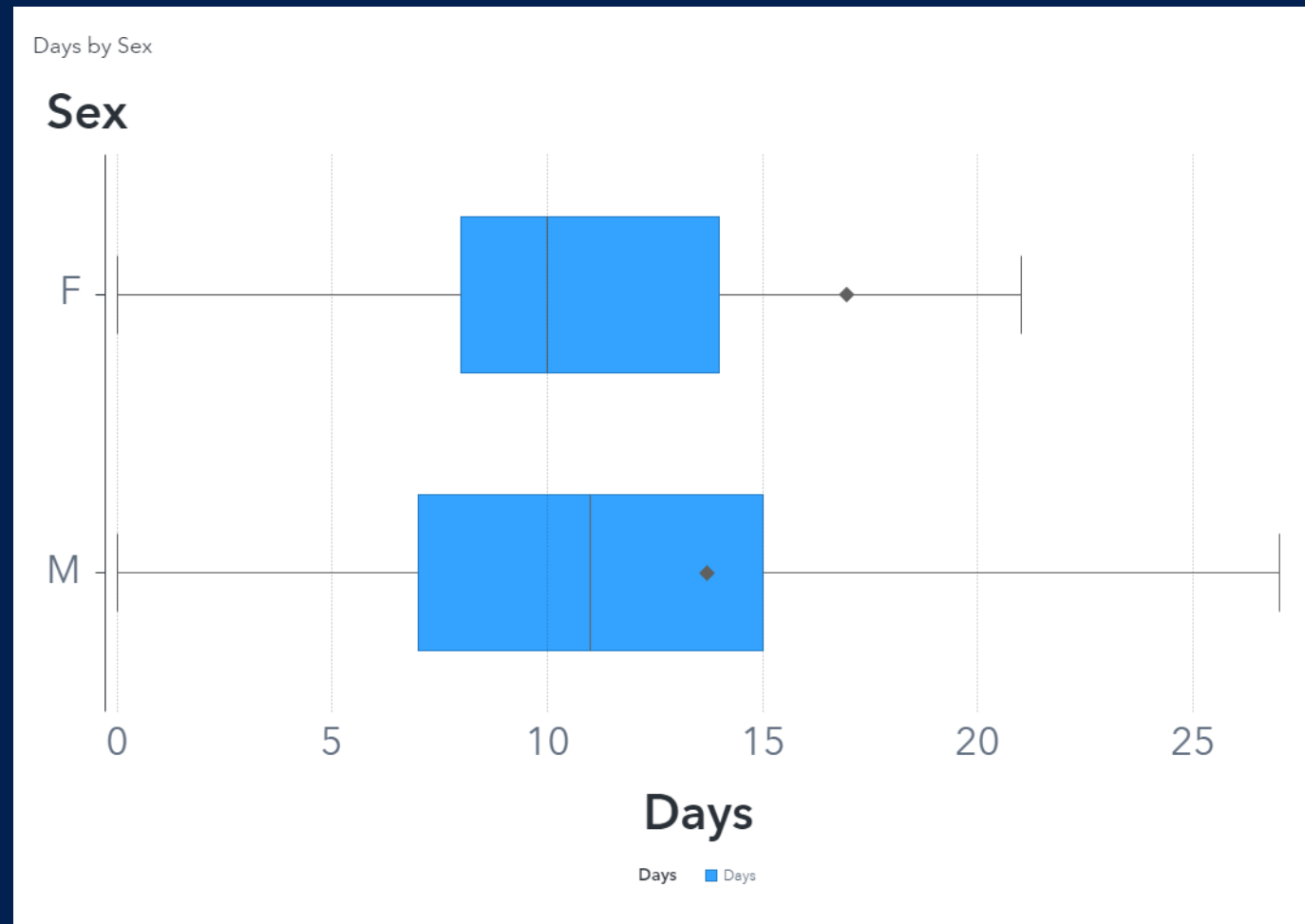


*Data is provisional and may change.

Days from Symptom Onset to Investigation Start 5/29/2022 to 1/25/2024*



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*Data is provisional and may change.

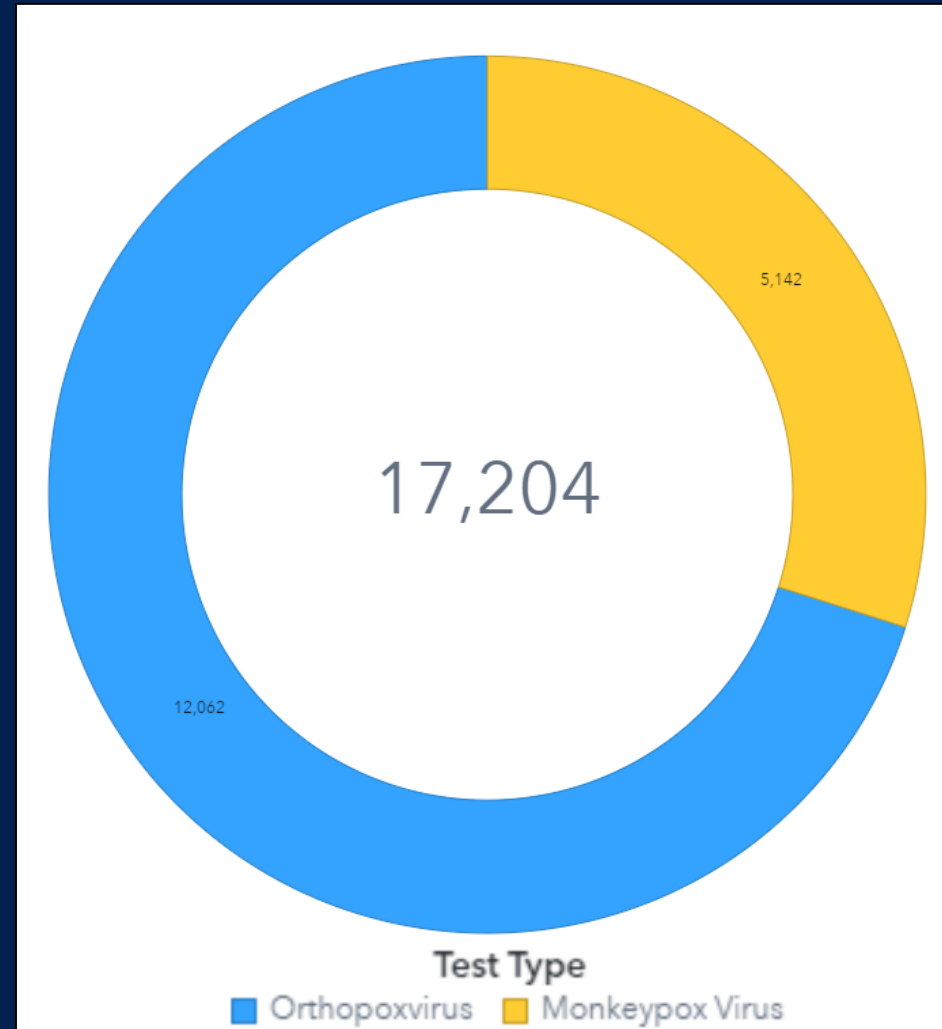
Laboratory Testing by PCR Test Type 5/29/2022 to 1/25/2024*



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*Data is provisional and may change.

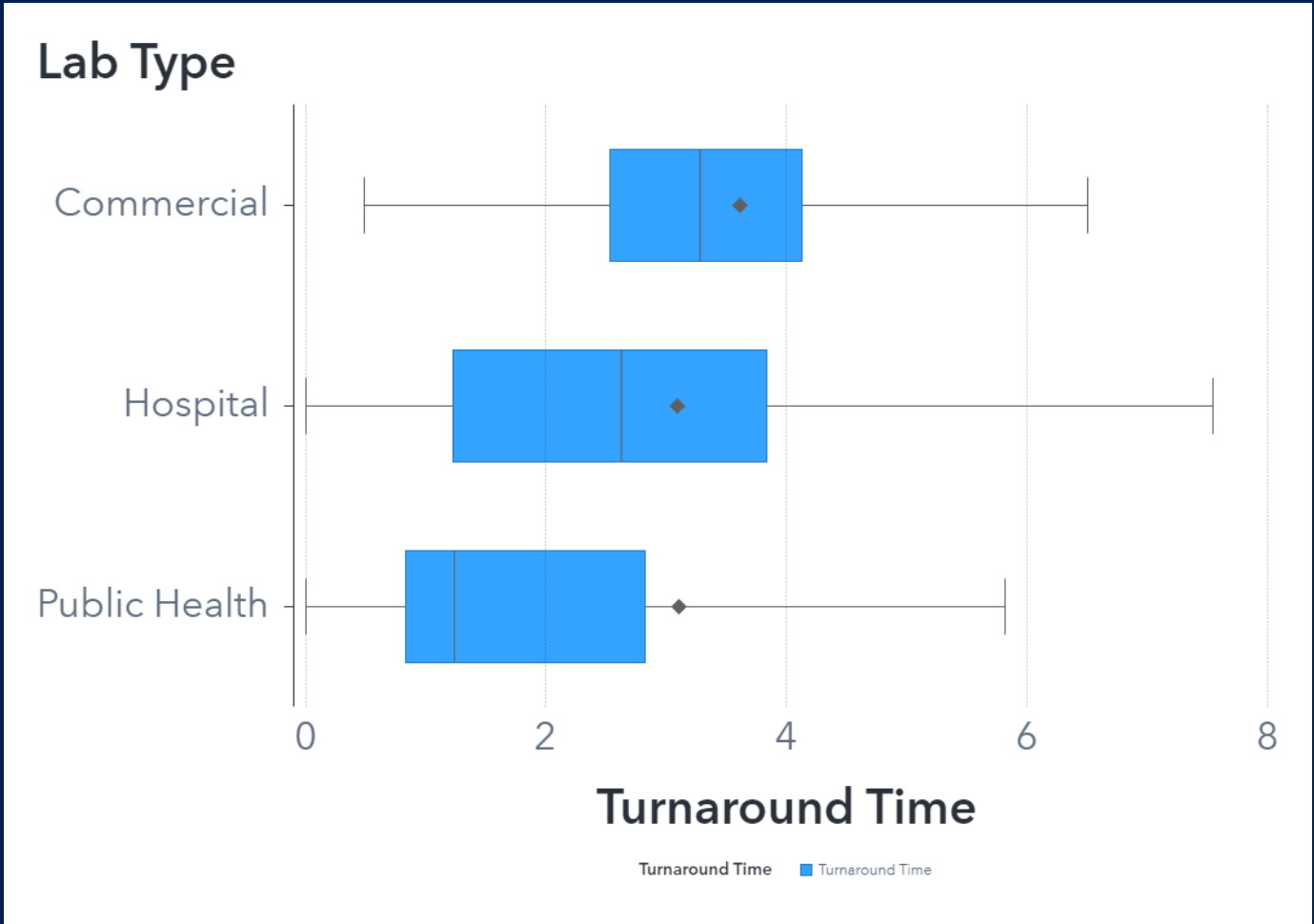
Laboratory Testing by Lab Type 5/29/2022 to 1/25/2024*



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*Data is provisional and may change.



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Monitoring High Consequence Infectious Diseases

Rania Milleron, SM, PhD

Epidemiologist II – High Consequence Infectious Diseases Team

Disease Surveillance and Epidemiology Section

Office of the Chief State Epidemiologist

Texas Department of State Health Services

February 16, 2024

Outline

- Overview 2021 -2023 Outbreaks and Events
- Qualtrics Exposure Risk Assessment Form
- Text Illness Monitoring Platform
 - What is TIM?
 - HCID monitoring tool
 - Participant benefits
 - User benefits
 - Onboarding a subagency
- Updated Monitoring Workflows

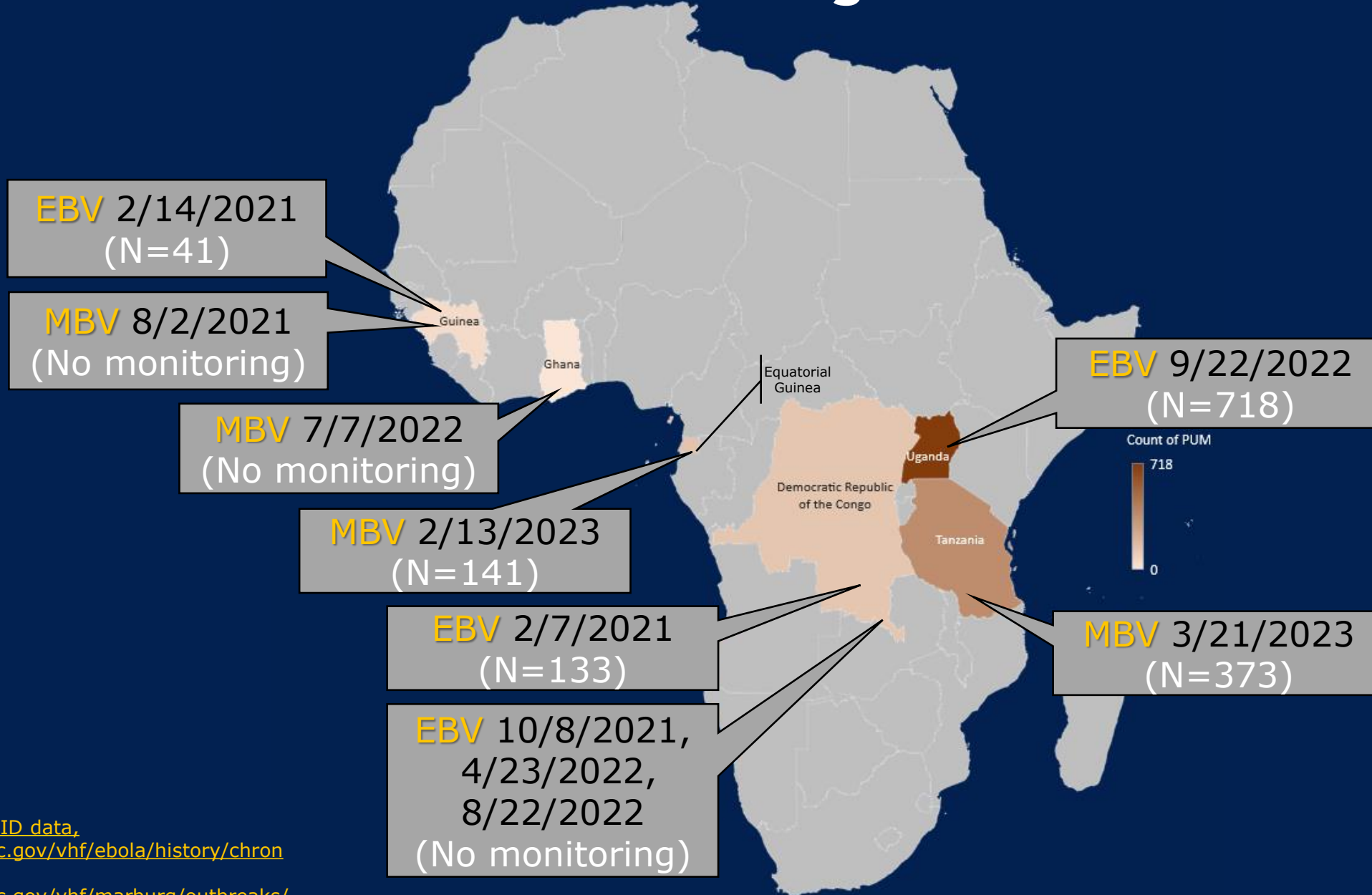


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Overview: Ebola & Marburg Outbreaks 2021-2023



Available at: [HCID data, https://www.cdc.gov/vhf/ebola/history/chronology.html](https://www.cdc.gov/vhf/ebola/history/chronology.html), and <https://www.cdc.gov/vhf/marburg/outbreaks/chronology.html>, accessed January 31, 2024.

Persons Under Monitoring (PUMs) 2021-2023



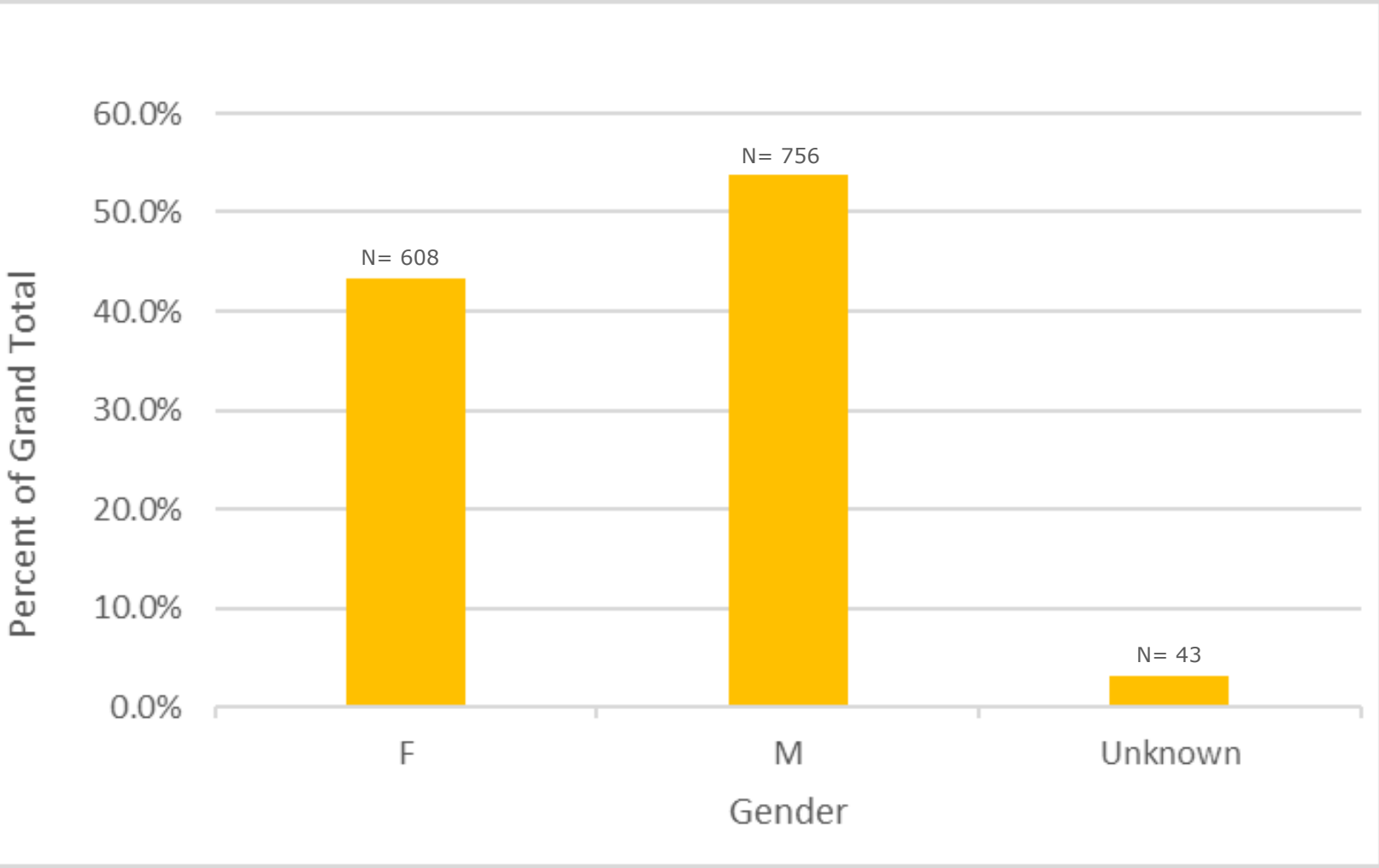
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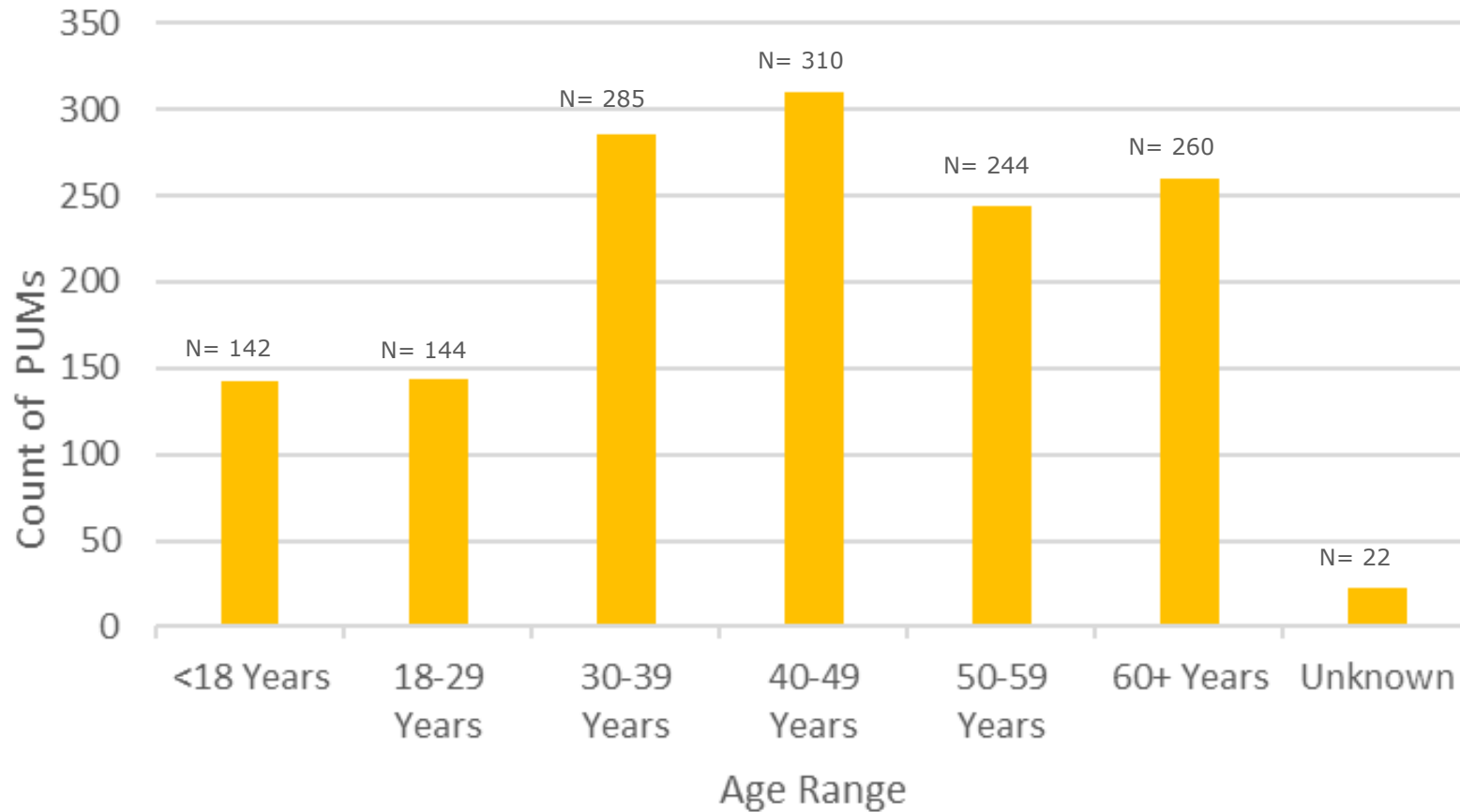
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Public Health Region (PHR)	Count of PUMs
PHR 1	19
PHR 11	21
PHR 2/3	593
PHR 4/5N	31
PHR 6/5S	510
PHR 7	153
PHR 8	72
PHR 9/10	8
Grand Total	1407

Sex of PUMs



Age of PUMs

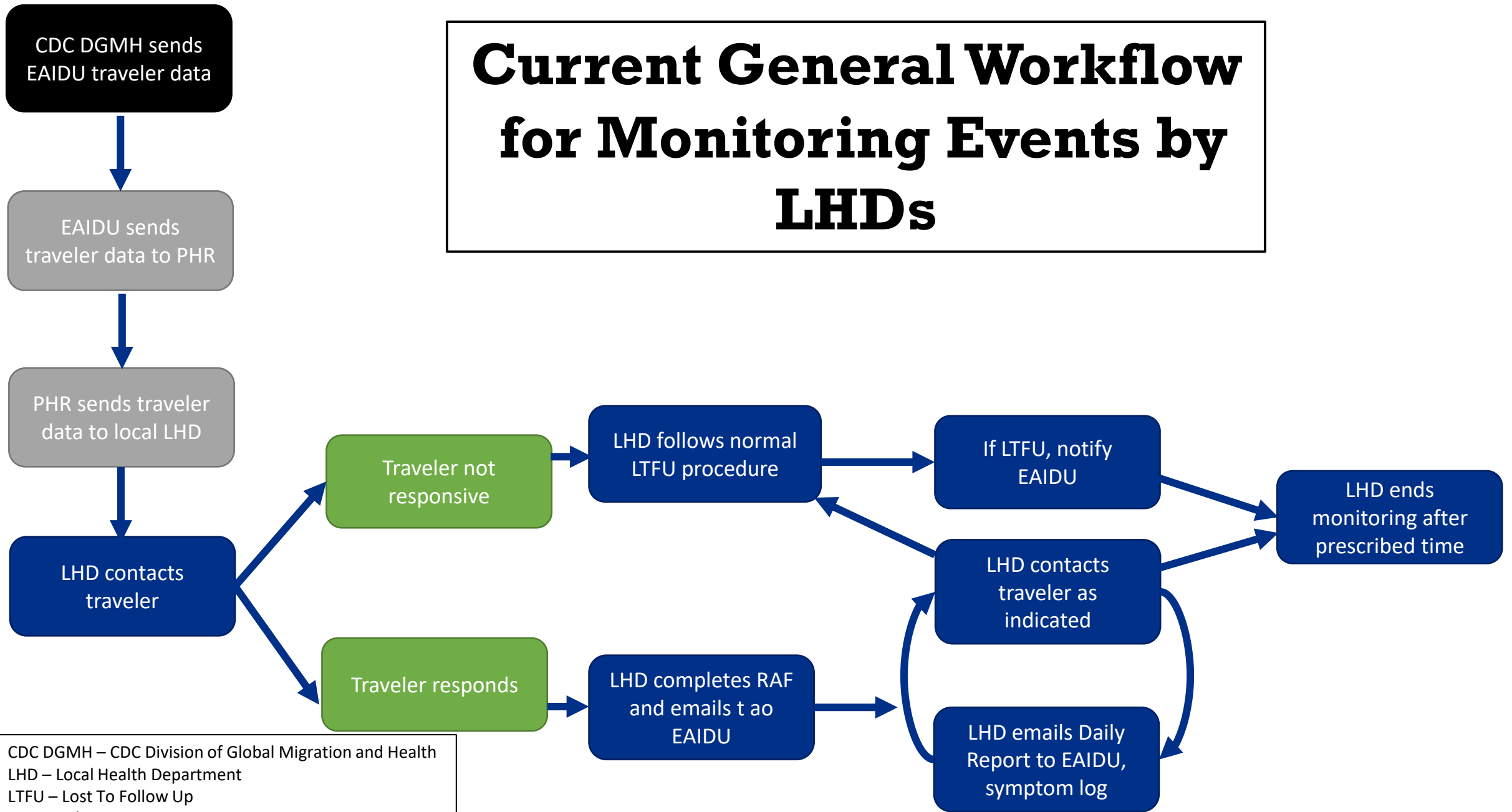


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Current General Workflow for Monitoring Events by LHDs



CDC DGMH – CDC Division of Global Migration and Health
LHD – Local Health Department
LTFU – Lost To Follow Up
RAF – Risk Assessment Form

User Survey on Ebola Monitoring



Turning a tsunami of work into a splash of efficiency. 

Survey results

- Automate forms & processes
- Qualtrics
- Text Illness Monitoring



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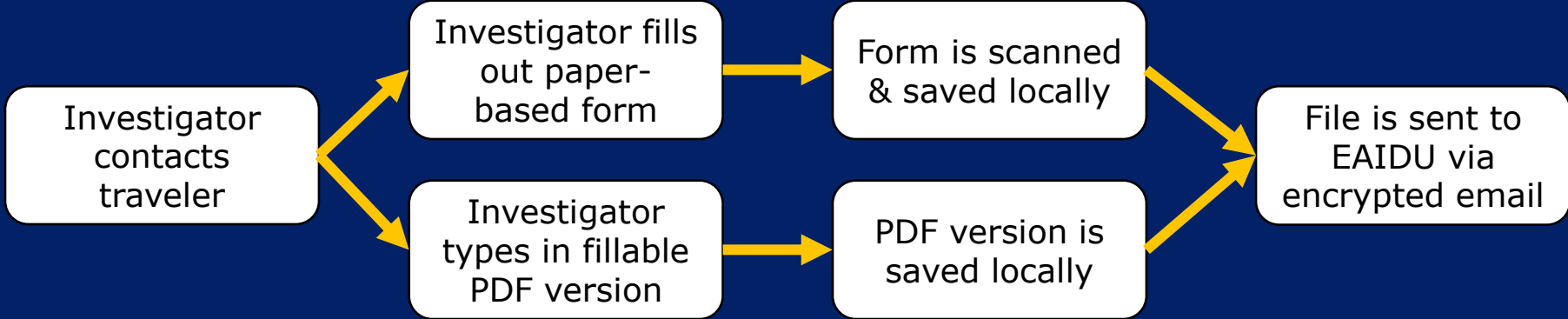
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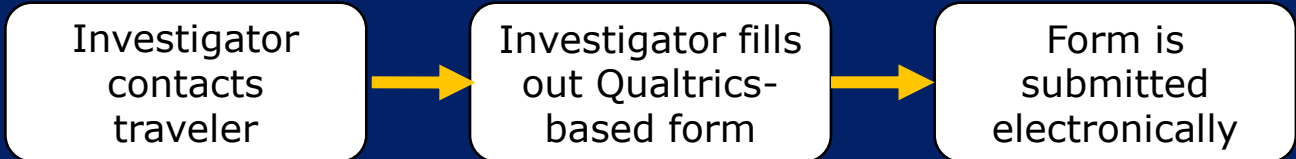
Risk Assessment Form (RAF)

Using Qualtrics to Streamline Communication

LHD Utilizing Paper-based RAF



LHD Utilizing Qualtrics RAF



Benefits of Qualtrics RAF

- DSHS-approved app
- HIPAA-compliant platform
- Investigators, the PHR, and the HCID Team can receive data in CSV and PDF format
- Eliminates encryption issues
- Eliminates secondary typographical errors
- Qualtrics RAF is like a guided interview; it is not sent out to the traveler
- Marburg and Ebola versions are currently available



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Text Illness Monitoring (TIM)

A Platform for Sharing Information Across Jurisdictions

What is TIM?

- Web-based app for monitoring symptoms
- Free to use for public health departments
- Monitors symptoms using two-way short message service (SMS) texts
 - 850 characters of text
 - No pictures, video, or audio
- Allows public health departments to identify enrolled symptomatic participants quickly



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HCID Use Cases for TIM

- Travelers returning from an outbreak country
 - Allows self-enrollment of travelers who can define the PII they provide
- Public health follow-up of individuals potentially exposed to:
 - Monkeypox virus
 - Another HCID pathogen (e.g., Ebola or Marburg viruses)
 - Other potential monitoring events
- Public health staff deployed to an outbreak response



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Benefits for Participants

- Individual travelers receive an assessment and educational material
- Less time spent interacting with public health
- Communication is minimally invasive and may eliminate numerous phone calls, emails, and sharing forms
 - Can self-enroll at any time and provide the level of information they prefer
 - Can choose to opt-out at any time, which gives clues for the LTFU reason



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Participant Messages



Day 0:
Welcome
Message

Day 1-21:
Symptom
Messages

12:17

< 290

+1 (202) 455-5938

+ (877) 464-5715

Local Public Health: Welcome! You are receiving messages because you recently arrived in the US from an outbreak country. You will receive your first daily symptom monitoring text tomorrow. Msg&data rates may apply.

+ (877) 464-5715
Today>

Local Public Health: Today or in the past 48 hours, have you or any of your travel companions had any of the following symptoms?
-Fever (100.4 F / 38 C or higher) or feeling feverish
-Headache or body aches
-Weakness or tiredness
-Sore throat
-Stomach pain
-Vomiting or diarrhea
-Unexplained bleeding or bruising
Please reply YES or NO

+ (877) 464-5715
Today>

Local Public Health: Thank you! We'll check in again tomorrow. If you develop any of these symptoms, reply SYM.

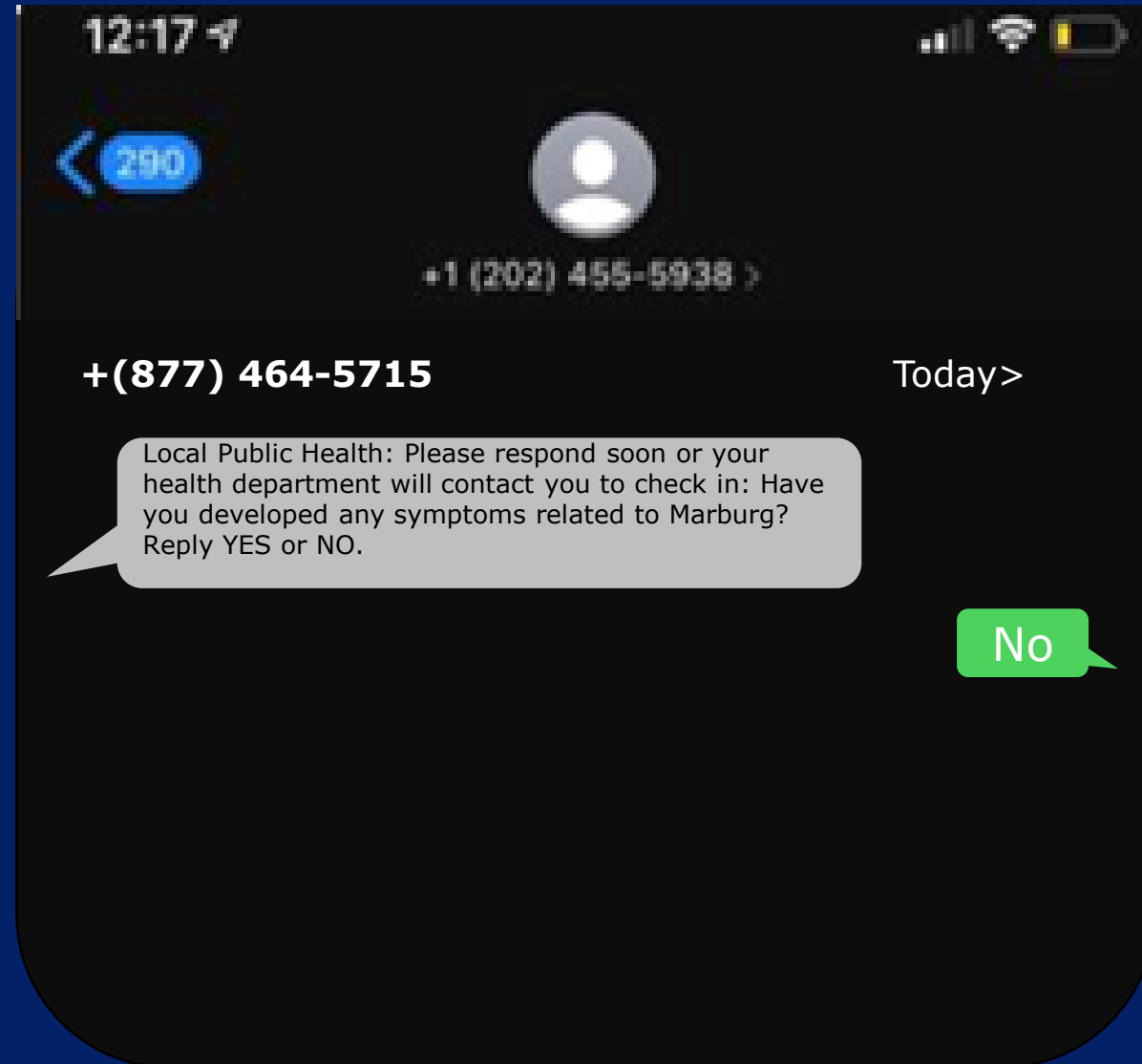
+ (877) 464-5715
Today>

Local Public Health: We're sorry to hear that. Your health department will contact you to check-in

No

Sym

Participant Reminders





Enrolling Participants

- There are two methods a user can add participants to TIM:
 - Manually
 - Bulk upload
- Participants can also self-enroll by texting a keyword to the TIM campaign phone number.



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TIM Health Department Benefits



- More efficient for health departments
- Improves communication between jurisdictions
- Standardizes monitoring procedures across jurisdictions



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User Personalization



- Personalize text messages
 - Other language options besides English
- Customize the monitoring period for the campaign or for a participant
- Create multiple campaigns to monitor different groups
- Remove/withdraw participants from monitoring
- Track the status of alerts and who is working on those alerts
- Send ad hoc “blast” messages to all active participants



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Interactive Campaign Dashboard



- Participant data
- Alert data
- Visualizations can be saved as a .PDF
- Data can be exported as a .CSV



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Participant Campaign Dashboard



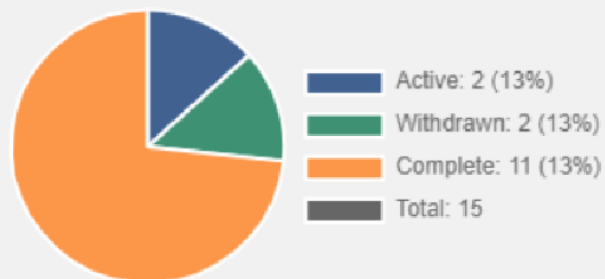
Campaign Dashboard

Generate PDF

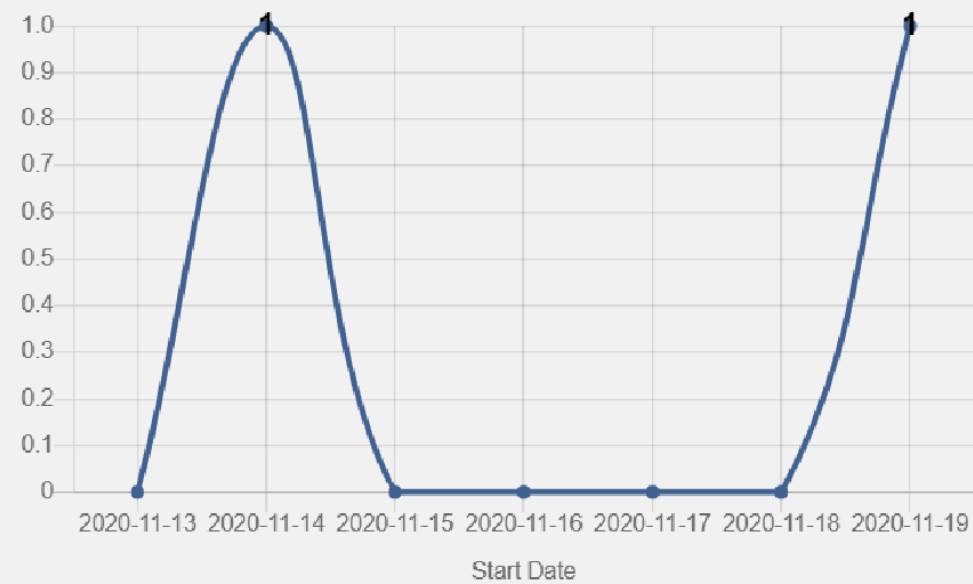
Summary

Analytics

Participant Status



New Participants - Last 7 Days



Alert Administration



- Alert details can be emailed to a specified address
- Alerts can include the date, description, and notes
- Users can save notes from alerts for follow-up



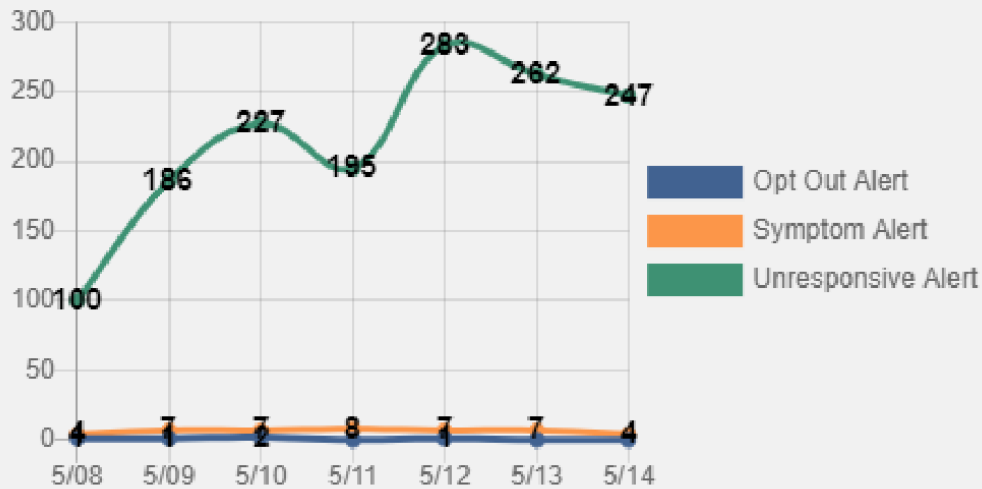
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Alert Campaign Dashboard

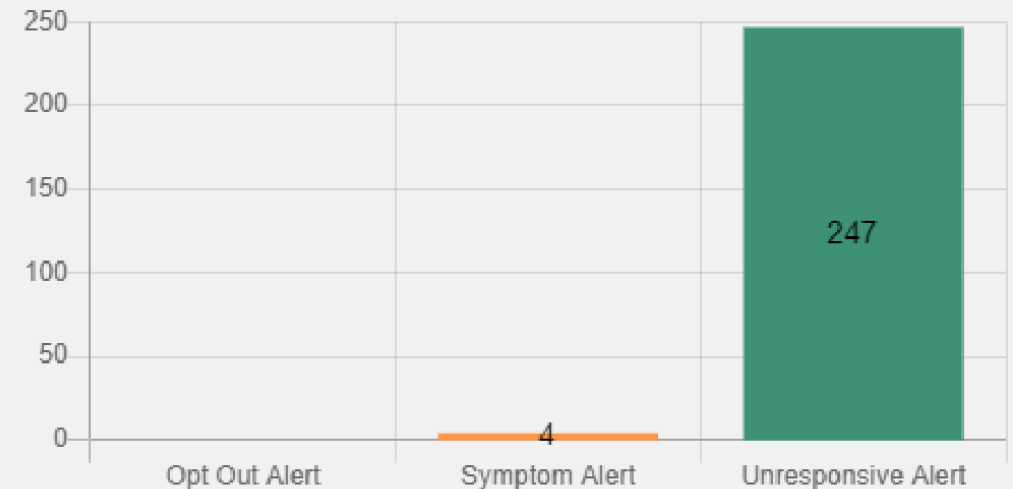


Alerts Logged - Last 7 Days



	Cleared	Pending	Working	Total Not Cleared (All Time)
Opt Out Alert	3	1	1	2
Symptom Alert	43	0	1	1
Unresponsive Alert	665	828	7	838
Totals:	711	829	9	841

Alert Status - Today



	Cleared	Pending	Working	Total
Opt Out Alert	0	0	0	0
Symptom Alert	3	0	1	4
Unresponsive Alert	49	198	0	247
Totals:	52	198	1	251

Alert Administration



Alert Detail

Campaign Name: Test Campaign 01

Client Participant Id:

Name:

Phone (xxxxxyzzzz):

Participant Campaign Length:

Status:

Start Date - End Date:

Alert Code:

Alert Description:

Alert Date/Time:

Notes:

Status:

Last Update User:

Last Update Date/Time:

State and Local Daily Monitoring Session Date/Time: 2020-08-04 09:00:14

Question	Response	Raw Response
Have you developed symptoms?	YES	Yes
(1 of 1)	<input type="button" value="1"/>	<input type="text" value="10"/>



Data Governance

- TIM is an approved Texas DSHS platform
- Reduces the need to email PII on monitored travelers which requires secure transfer of documents
- Includes only minimal Personal Identifiable Information
 - Mobile phone number
 - Name (if entered)
 - Number of days remaining in the monitoring period
 - History of text message responses (including content, date, and time)
- This infrastructure is constantly maintained, enhanced, and verified by Amazon Web Services (AWS), and regular penetration testing is employed to validate the performance of security controls and processes



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Protects and Secures Information



- Unauthorized traffic is blocked to and within AWS centers
- TIM uses standard Security Development Lifecycle (SDL) principles, embedding security requirements into every development phase
- The upgraded platform is hosted by AWS cloud centers, which has standards in place to help protect data in accordance with PII and HIPAA guidelines
- Connections established between user's desktop and the data centers are encrypted
- All public endpoints are secured using industry-standard Transport Layer Security (TLS), which effectively establishes a security-enhanced browser-to-server connection using HTTPS to help ensure data confidentiality and integrity



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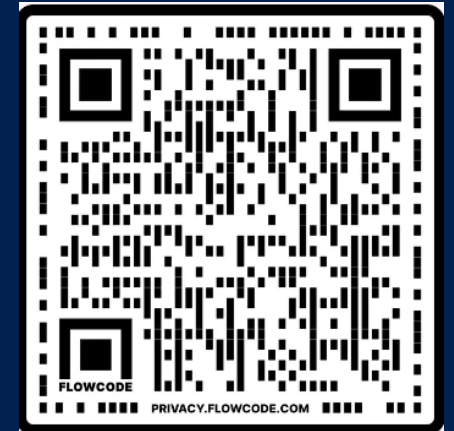
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TIM Onboarding



- Fill out the form indicating your interest at <https://www.cdc.gov/ncird/surveillance/tim/contact-us.html>
- A sub-agency user account will be created for you under the Texas user
- An automated email will be sent from TIM with the link and temporary password



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TIM Support



- Contact the TIM helpdesk at helpdesk@tim-2.com
 - Technical assistance
 - System issues
 - Additional training



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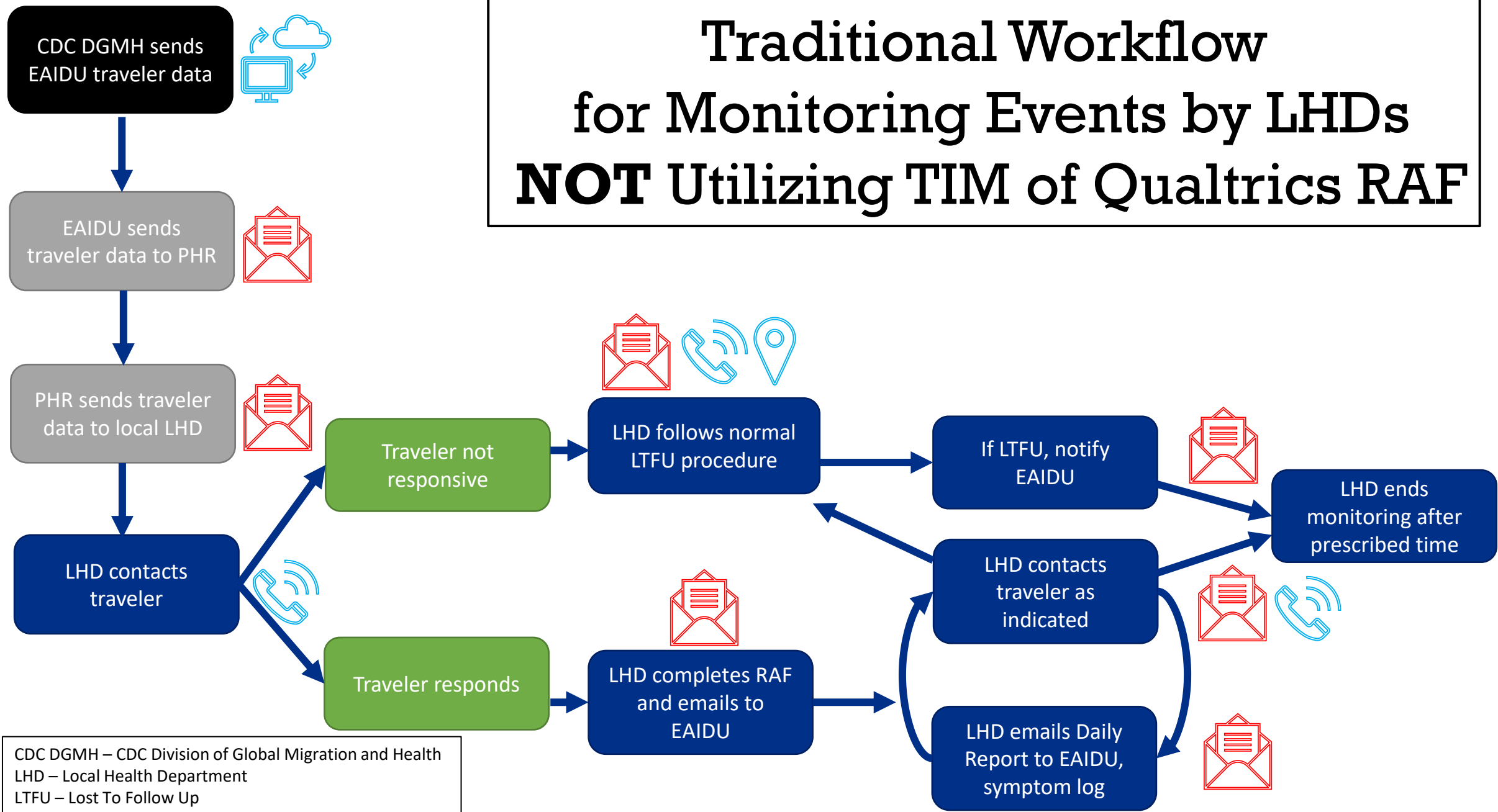
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Sample Monitoring Workflows

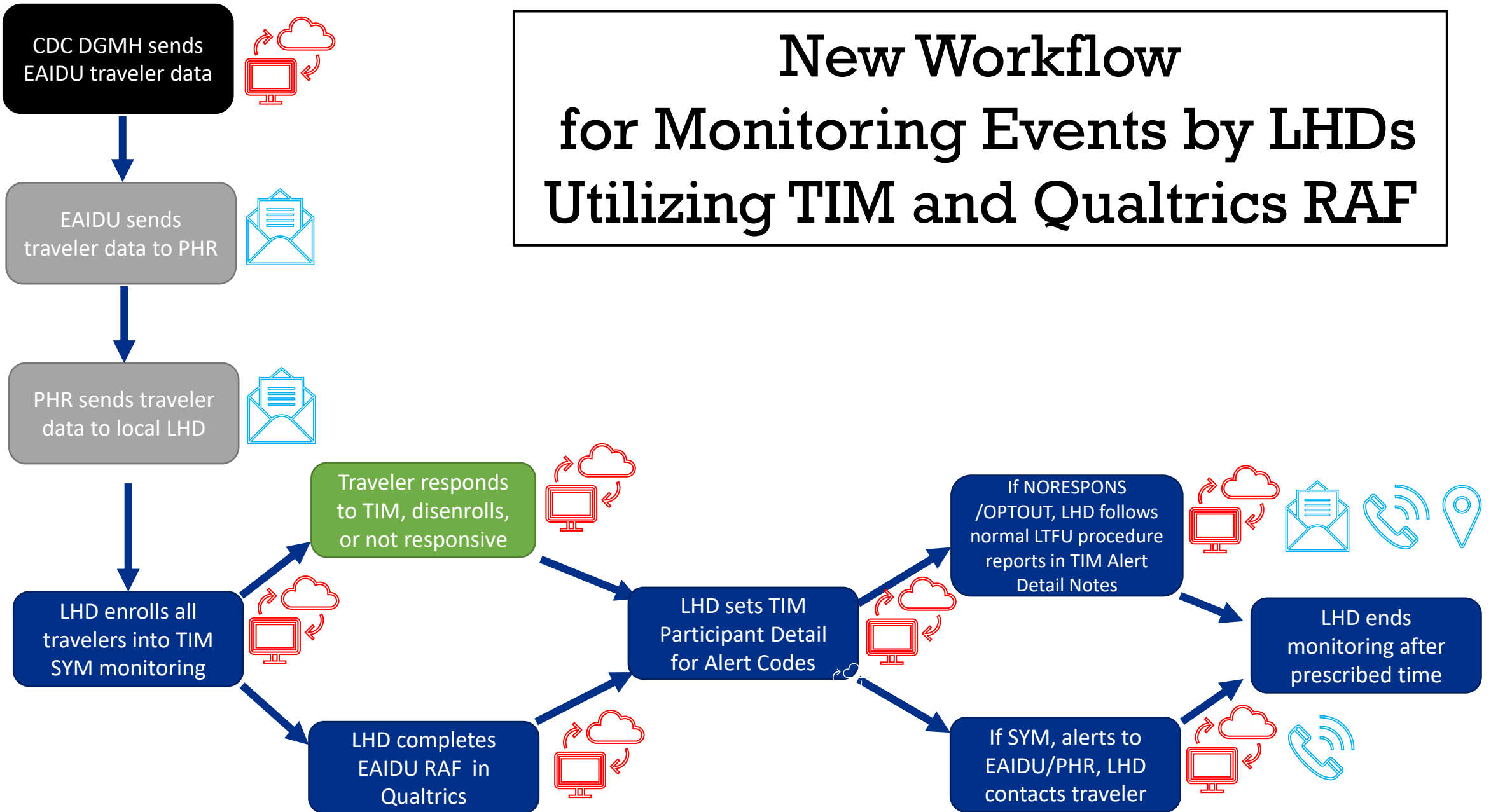
Using Qualtrics to Streamline Communication

Traditional Workflow for Monitoring Events by LHDs **NOT** Utilizing TIM of Qualtrics RAF



CDC DGMH – CDC Division of Global Migration and Health
 LHD – Local Health Department
 LTFU – Lost To Follow Up
 RAF – Risk Assessment Form

New Workflow for Monitoring Events by LHDs Utilizing TIM and Qualtrics RAF



Conclusion

- For jurisdictions that utilize both TIM and the Qualtrics RAF
 - Cloud-based platforms are more efficient than email
 - Input data will be exportable in .CSV format
 - Less data wrangling means better
 - Communication
 - Dashboards
 - Visualizations
- More effective public health response



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Thank You!

Updates on High Consequence Infectious Diseases

EAIDUMonitoring@dshs.texas.gov

