TN NHSN User Call

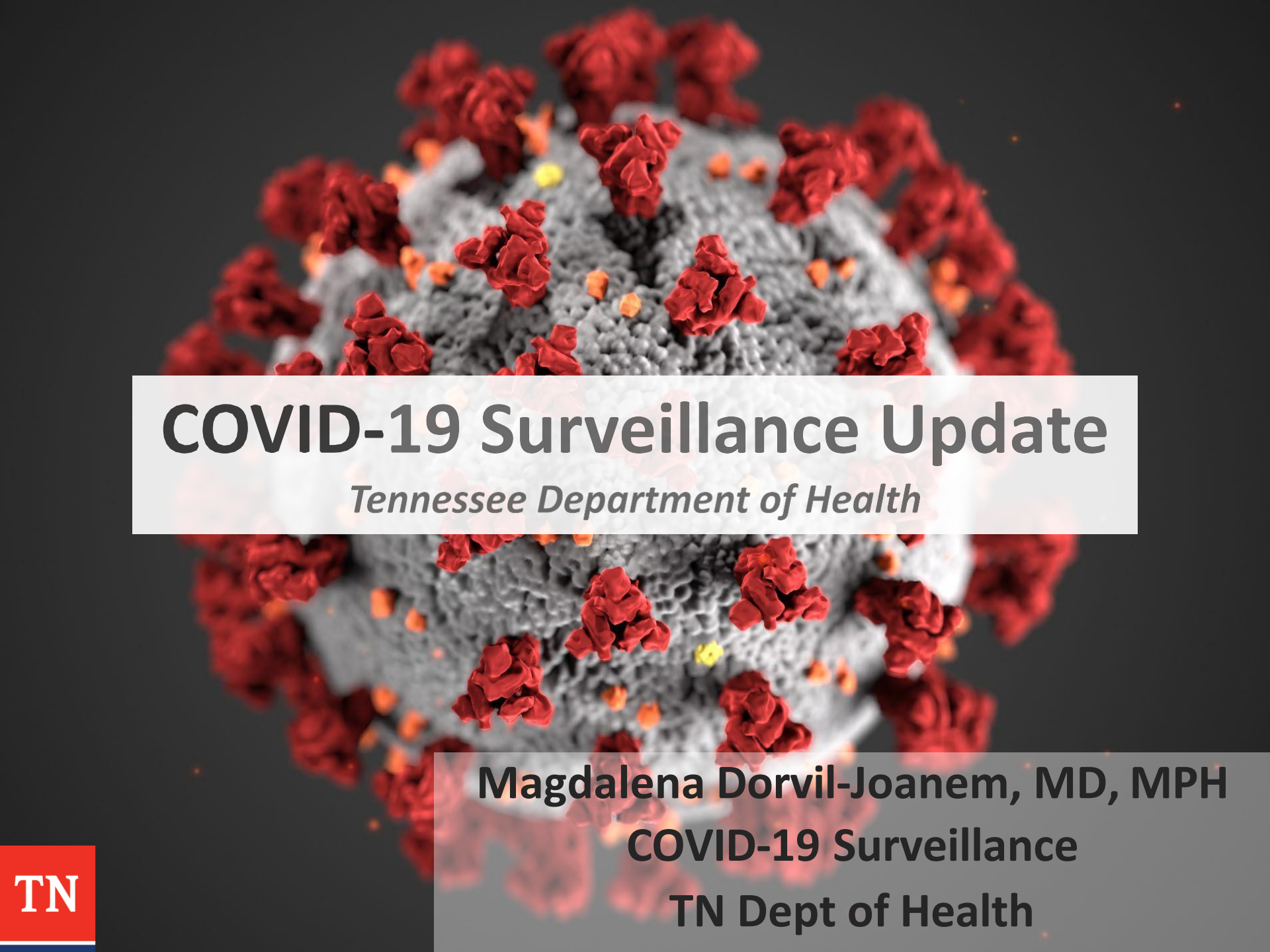
Monday, July 17, 10am CT

Agenda

- **COVID-19 Update**
  - Magdalena Dorvil-Joanem, MD, MPH
- **NHSN Update**
  - Vicky Lindsey, AAS, RN, CIC
- **Data Demo**
  - Abigail Marrero, MPH, CPH
- **Malaria**
  - Dr. Abelardo Moncayo, Ph.D.
- **Multi-Drug Resistant Organism (MDRO) Surveillance Team Update**
  - Cody Rocha, MPH, CPH

TDH NHSN Team

- **Abigail Marrero, MPH, CPH**
  - Senior NHSN Epidemiologist
- **Vicky Lindsey, AAS, RN, CIC**
  - Senior NHSN Public Health Nurse Consultant
    - Lead Technological Assistance
  - Infection Prevention and Control Specialist
- **Tara Suhs, MPH**
  - Assistant NHSN Epidemiologist
  - MRSA Initiative Lead
- **Ashley Gambrell, MPH**
  - Assistant NHSN Epidemiologist
- **Marissa Turner, MPH**
  - Assistant NHSN Epidemiologist
- **Alex Kurutz, MPH**
  - Dialysis Epidemiologist
- **Dr. Simone Godwin, DVM, MPH, MS**
  - Outbreak Lead



COVID-19 Surveillance Update

Tennessee Department of Health

Magdalena Dorvil-Joanem, MD, MPH
COVID-19 Surveillance
TN Dept of Health

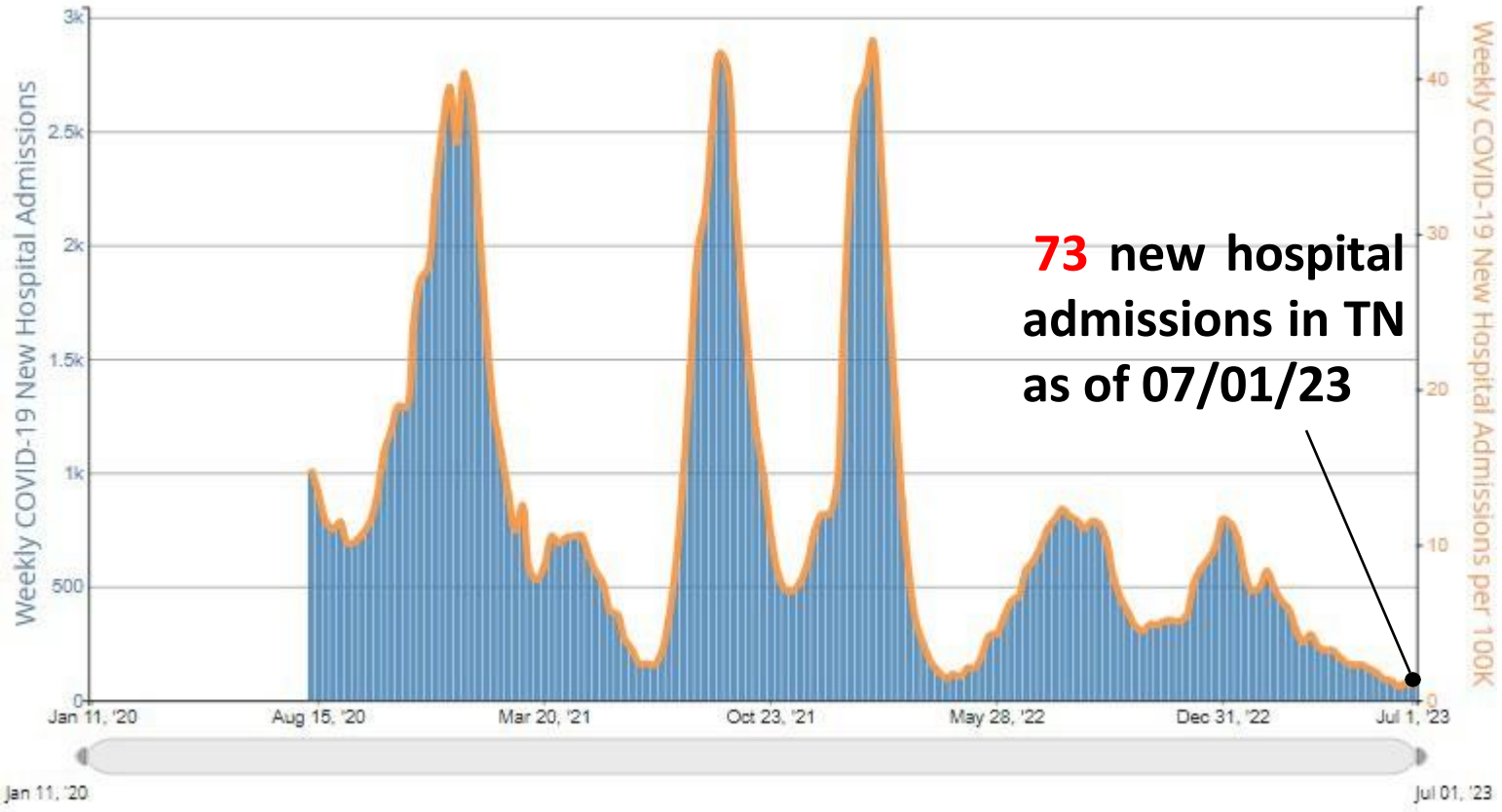
TN

COVID-19 Trends in TN & US

- **Tennessee**
  - **New cases decreasing (total ~1000/week)**
  - **Hospitalizations decreasing (76 hospitalized)**

- **U.S.A.**
  - **New hospitalizations decreasing**
  - **Deaths decreasing**

New Hospital Admissions

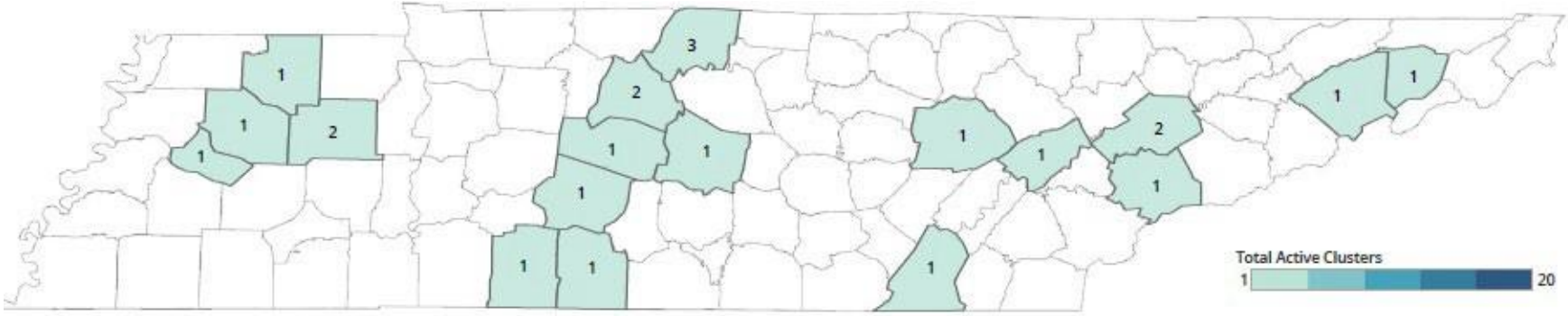


COVID Cluster in High-Risk Settings

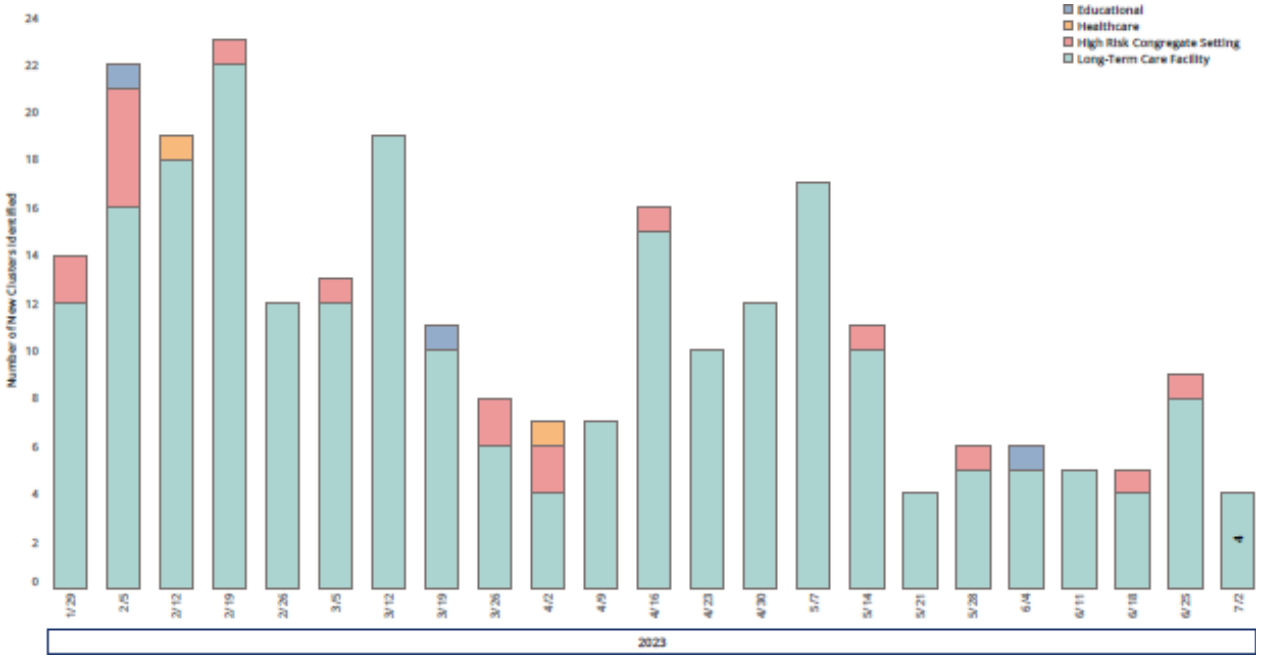
23 Total Active Clusters

High-risk settings include long-term care facilities, correctional facilities, shelters, and other congregate settings

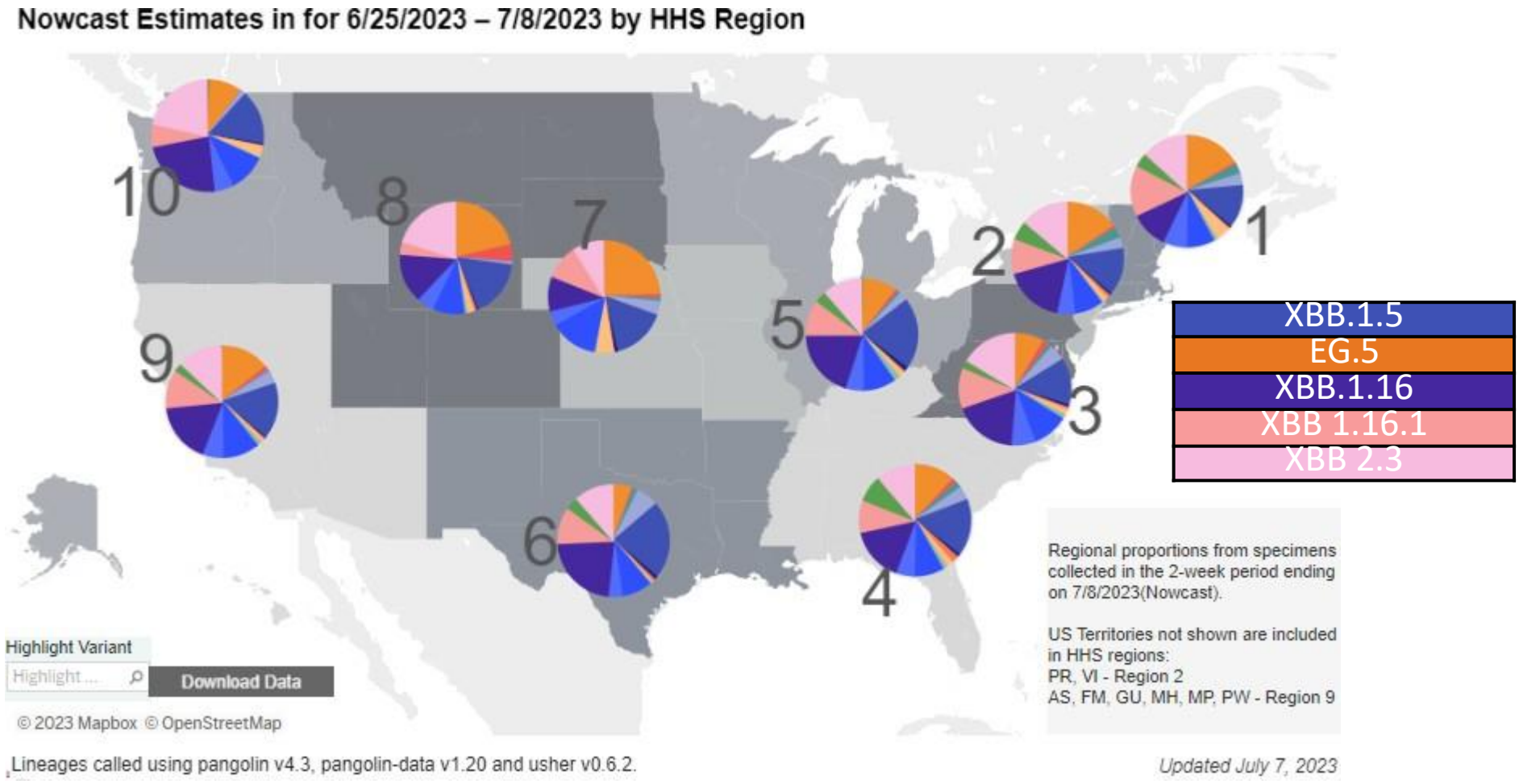
Active Clusters by County



Confirmed Clusters by Week and Facility Type



Variant Proportions by HHS Region



NHSN Updates

Vicky Lindsey, AAS, RN, CIC| Tennessee Department of Health | Communicable and Environmental Diseases and Emergency Preparedness

NHSN Update

- We are 2 days away from the first NHSN Protocol and Training Team (PaTT) Ask the Experts webinar!
- Please join NHSN on July 19, 2023, to discuss How to Use the NHSN Organism List.
  - This is a 60-minute Q & A session that starts at 2 p.m. EDT.

NHSN Update

- Have a question on this topic?
  - Please submit it early!
  - On the registration form you can enter a question about the NHSN Organism List for the Subject Matter Experts to answer if time permits.
- Audience:
  - All Patient Safety Component (PSC) Users of NHSN are invited, however the conversation will be geared to newer NHSN users, 3 years or less experience.

NOTE: This session will not be recorded

NHSN Update

- Ready to Ask the PaTT Experts about the NHSN Organism List?

- Link to register and submit questions for this session.
  - https://cdc.zoomgov.com/webinar/register/WN_I1B8Pyg1TEKxIRAr0HeCrw

- If you have any questions about the webinar series, they can be emailed to NHSNTrain@cdc.gov.

NHSN Data Demo

Agenda of Instructions

- Outbreak investigation scenario
- Exporting report
  - All SSI Line List
- Using Excel to investigate outbreak
  - Demographics
  - Timeline

Serratia marcescens

- *S. marcescens* is a gram-negative bacillus that occurs naturally in soil and water
- Common bacterium that can cause several serious opportunistic infections in hospital patients
- Causes generic infections in wound sites, as well as the urinary tract, respiratory system and eyes
- Most strains are resistant to several antibiotics

Outbreak Questions for IP's

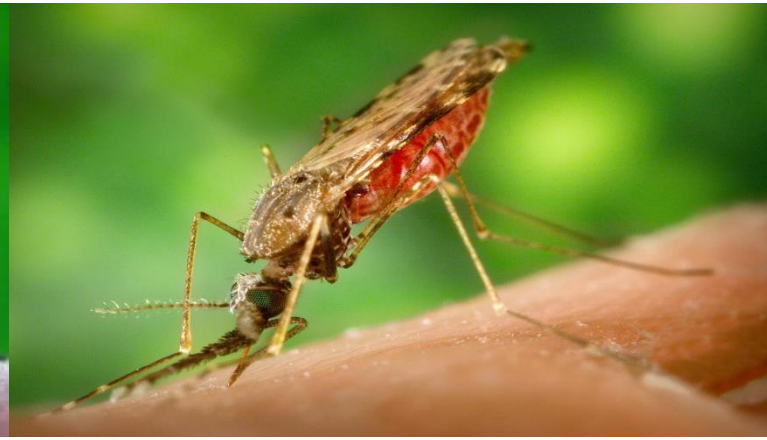
1. What are the patient demographics of the identified cases (e.g., DOB, race, gender, comorbidities)?
2. What was the timeline of positive case identification?
3. How long were the patients admitted to the facility?

TN Department of Health

Malaria

Dr. Abelardo Moncayo, Ph.D.
Director, Vector-Borne Diseases Program





Mosquito-borne Diseases

Mosquito-Borne Diseases

Imported cases vs. Endemic cases

Imported

Malaria

Dengue

Chikungunya

Zika

Yellow Fever

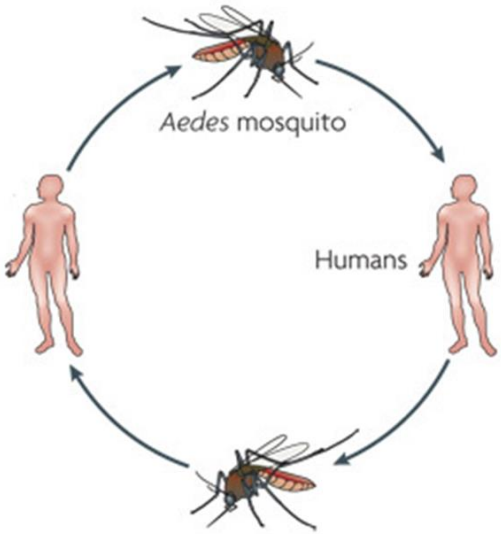
Endemic

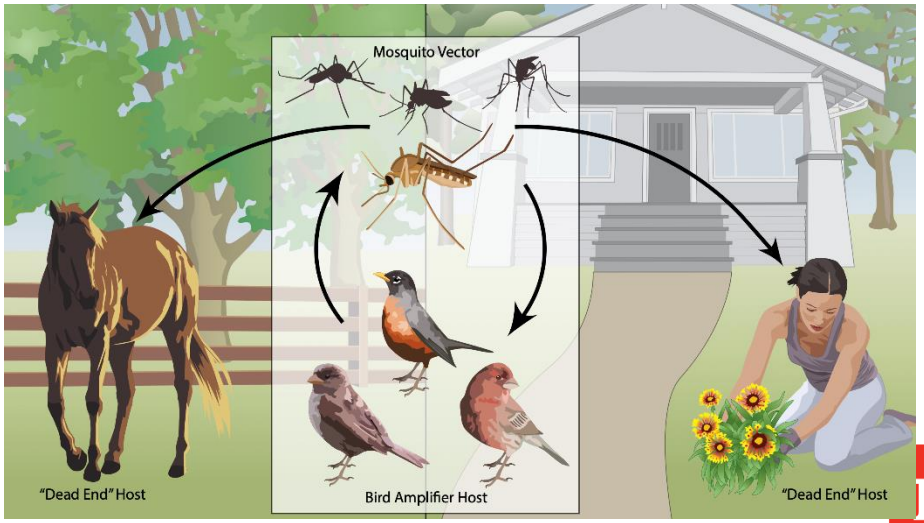
St. Louis encephalitis

La Crosse encephalitis

West Nile

Eastern equine encephalitis



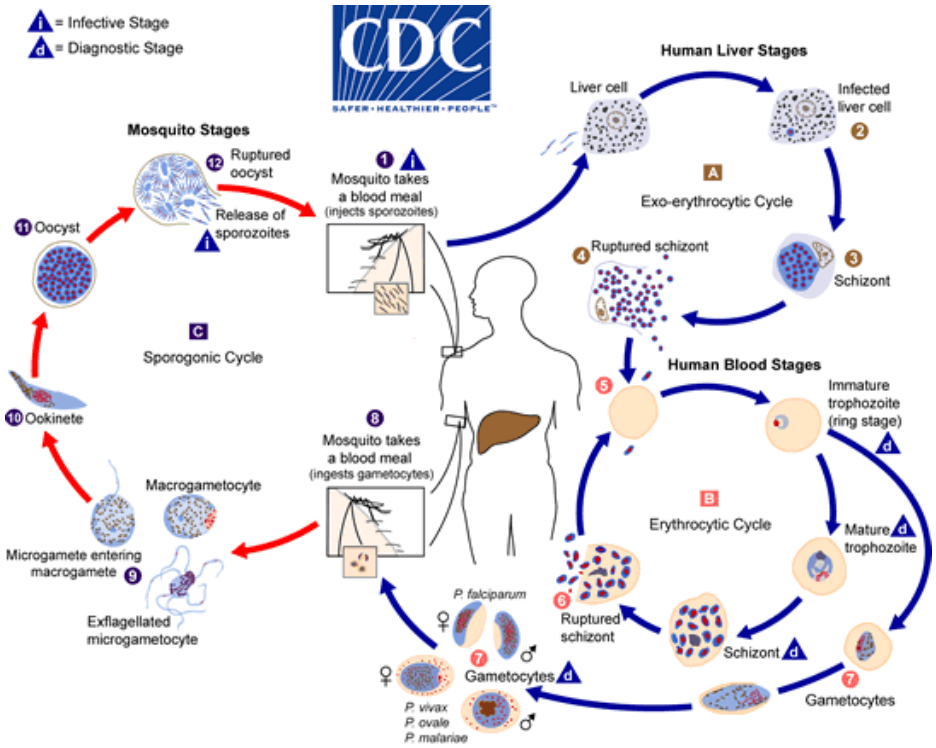


Background

- May have caused the largest total burden of human illness in history
  - Steady annual incidence
  - Geographically widespread
- Statistics
  - A child dies every minute
  - Half a million deaths per year in 106 countries
  - 219 million sickened
  - Most cases – Nigeria, Mozambique, DRC, Uganda
- Pregnancy complications, immunosuppressive (therefore risk of TB, flu, pneumonia), repeated infections affect cognition; therefore education, poverty, reduced economic growth, political instability
- Major contributor to global inequality (costs $12B annually in direct costs); “malaria enslaves those it does not kill” – Ronald Ross

Malaria parasites and life cycles

- 5 species of plasmodia
- Mosquito-borne
- Plasmodia escape detection in the liver
- Burst from liver and go to RBCs where replicate asexually
- Burst and destroy RBCs and go to bloodstream (every 48 or 72 hrs) - fever
- Resulting gametes are picked up by mosquitoes where undergo sexual reproduction forming sporozoites which migrate to the proboscis of the mosquito



Transmission

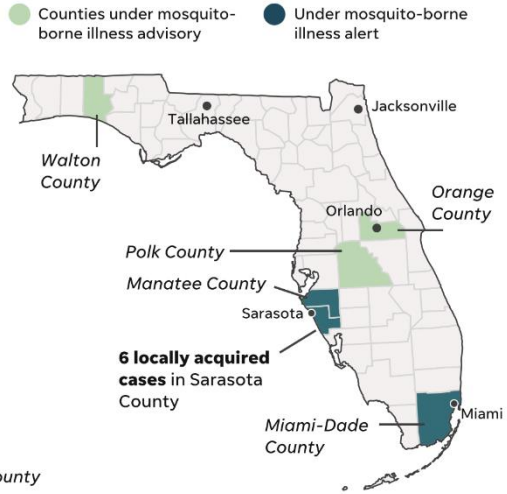
- Many mosquito species with different habitat predilections and behaviors
- Attracted to light, CO2, temperature and odor; bite repeatedly
- Tropical climates generate year-wide transmission; temperate climates result in season of transmission
- Drought reduces transmission; deforestation and climate change increase transmission
- Open homes and crowding increase transmission; wars bringing people closer together increase transmission (refugee camps)
- Malnourishment increases chances of symptomatic infections

Malaria in Texas and Florida

Malaria cases in Texas and Florida

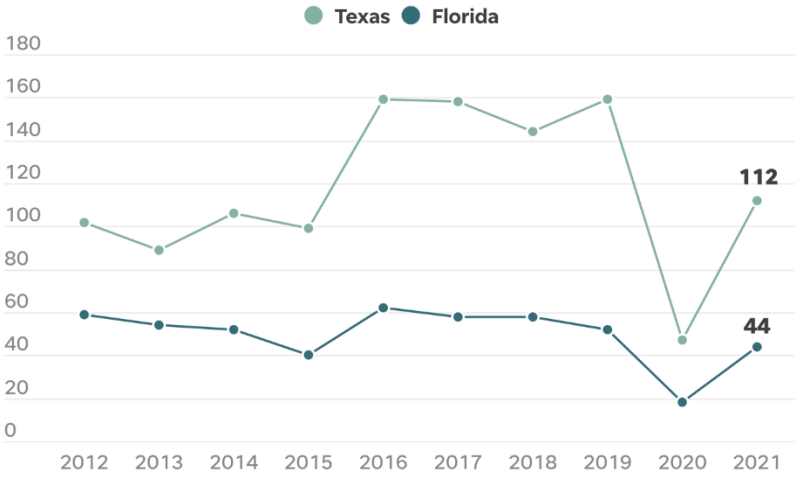
Each year, Texas experiences about 120 cases of malaria brought on by travel. In 1994, Texas reported its last locally acquired case.

The number of locally acquired malaria infections in Florida has risen to six after two more cases were reported.



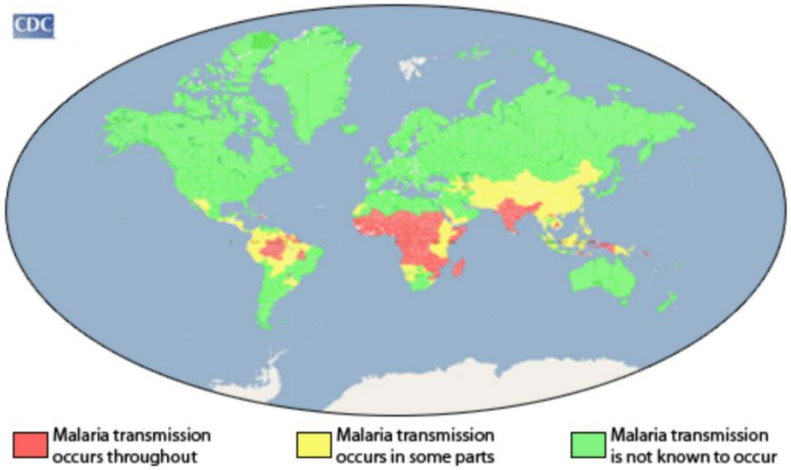
Past cases of malaria in Texas and Florida

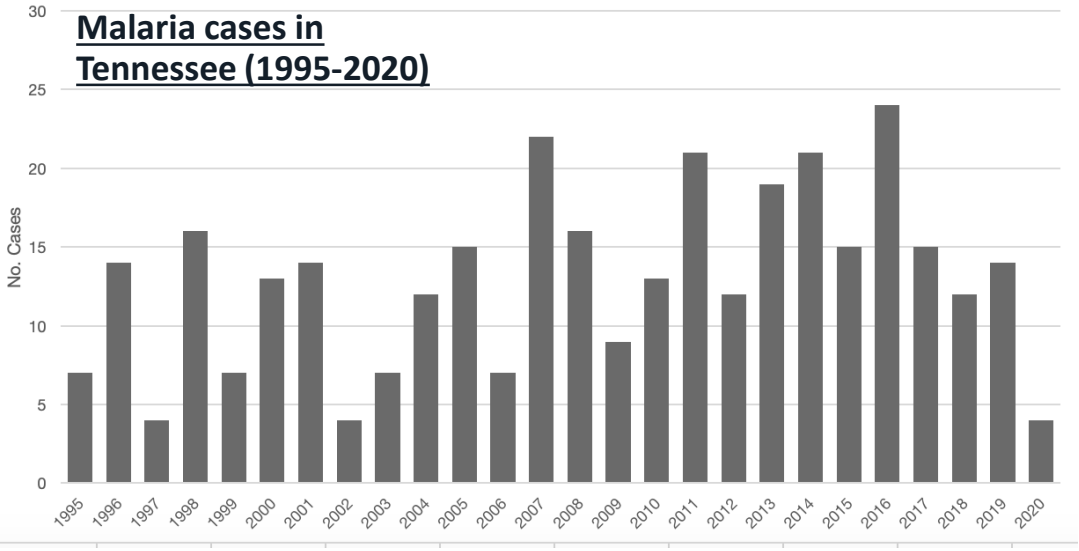
Number of reported cases of malaria by year, 2012-2021



Malaria: Geographic Distribution and Epidemiology

- Malaria is endemic in places that are also endemic to many other mosquito-borne diseases.
- Most cases of malaria in the U.S. are from returned travelers.





Malaria: Clinical Manifestations and Diagnostics

- **Incubation period**: 7 - 30 days
- Patients should remind HCPs of any travel in malaria endemic areas during the past 12 months.

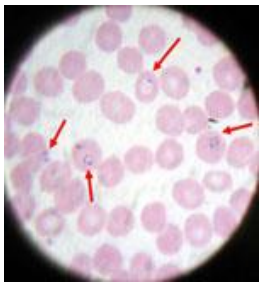
- **<u>Uncomplicated Malaria</u>**
  - Fever, chills, headaches
  - Nausea and vomiting
  - Body aches and general malaise

- **Severe Malaria**
  - Cerebral malaria, abnormal behavior, seizures, coma, or other neurologic abnormalities
  - Severe anemia

  - Acute respiratory distress syndrome (ARDS)
  - Abnormalities in blood coagulation
  - Acute kidney injury

  - Hyperparasitemia, where more than 5% of the red blood cells are infected by malaria parasites
  - Death

- **<u>Testing</u>:**
- Microscopy - remains the “gold standard” for laboratory confirmation of malaria.



- Rapid Diagnostic Test – quick but does not eliminate the need for malaria microscopy.
- Detection of species specific parasite DNA in a sample of peripheral blood using a Polymerase Chain Reaction (PCR) test.

Malaria: Prevention and Treatment

- **Prevention:** Antimalarial drugs!
  - Atovaquone/Proguanil (Malarone), Chloroquine, Doxy, and more

- Anti-malarial drug recommendations differ by country of travel.
- No antimalarial drug is 100% protective.
- Must be combined with use of insect repellent, long sleeves, long pants, sleeping in a mosquito-free setting or using an insecticide-treated bed net.

- **Treatment:** Should be initiated as soon as possible since Malaria can be severe and potentially fatal.
- Some drugs that can be used to treat are: Chloroquine, Atovaquone-proguanil (Malarone®), Artemether-lumefantrine (Coartem®)
- Treatment for severe malaria (IV artesunate) is now commercially available in the U.S. and is available at the CDC and clinicians must call CDC to obtain treatment.

Guidelines for Treatment of Malaria in the United States 1

(Based on drugs currently available for use in the United States – updated July 1, 2013)

CDC Malaria Hotline: (770) 488-7788 or (855) 856-4713 toll-free Monday-Friday 9 am to 5 pm EST - (770) 488-7100 after hours, weekends and holidays

Clinical Diagnosis/ *Plasmodium* species	Region Infection Acquired	Recommended Drug and Adult Dose[1]	Recommended Drug and Pediatric Dose[1] *Pediatric dose should NEVER exceed adult dose*
Uncomplicated malaria/ ***P. falciparum*** or Species not identified If "species not identified" is subsequently diagnosed as *P. vivax* or *P ovale:* see *P. vivax* and *P ovale* (below) re. treatment with primaquine	**Chloroquine-resistant or unknown resistance**[2] (All malarious regions except those specified as chloroquine-sensitive listed in the box below.)	**A. Atovaquone-proguanil (Malarone™)**[3] **Adult tab = 250 mg atovaquone/ 100 mg proguanil** 4 adult tabs po qd x 3 days	**A. Atovaquone-proguanil (Malarone™)**[3] **Adult tab = 250 mg atovaquone/ 100 mg proguanil** **Peds tab = 62.5 mg atovaquone/ 25 mg proguanil** 5 - 8kg: 2 peds tabs po qd x 3 d 9-10kg: 3 peds tabs po qd x 3 d 11-20kg: 1adult tab po qd x 3 d 21-30kg: 2 adult tabs po qd x 3d 31-40kg: 3 adult tabs po qd x 3d > 40 kg: 4 adult tabs po qd x 3d
		B. Artemether-lumefantrine (Coartem™)[3] **1 tablet = 20mg artemether and 120 mg lumefantrine** A 3-day treatment schedule with a total of 6 oral doses is recommended for both adult and pediatric patients based on weight. The patient should receive the initial dose, followed by the second dose 8 hours later, then 1 dose po bid for the following 2 days. 5 - <15 kg: 1 tablet per dose 15 - <25 kg: 2 tablets per dose 25 - <35 kg: 3 tablets per dose ≥35 kg: 4 tablets per dose	
		C. Quinine sulfate plus one of the following: Doxycycline, Tetracycline, or Clindamycin **Quinine sulfate:** 542 mg base (=650 mg salt)[4] po tid x 3 or 7 days[5] **Doxycycline:** 100 mg po bid x 7 days **Tetracycline:** 250 mg po qid x 7 days **Clindamycin:** 20 mg base/kg/day po divided tid x 7 days	**C. Quinine sulfate[4] plus one of the following: Doxycycline[6], Tetracycline[6] or Clindamycin** **Quinine sulfate:** 8.3 mg base/kg (=10 mg salt/kg) po tid x 3 or 7 days[5] **Doxycycline:** 2.2 mg/kg po every 12 hours x 7 days **Tetracycline:** 25 mg/kg/day po divided qid x 7 days **Clindamycin:** 20 mg base/kg/day po divided tid x 7 days
		D. Mefloquine (Lariam™ and generics)[7] 684 mg base (=750 mg salt) po as initial dose, followed by 456 mg base (=500 mg salt) po given 6-12 hours after initial dose Total dose= 1,250 mg salt	**D. Mefloquine (Lariam™ and generics)**[7] 13.7 mg base/kg (=15 mg salt/kg) po as initial dose, followed by 9.1 mg base/kg (=10 mg salt/kg) po given 6-12 hours after initial dose. Total dose= 25 mg salt/kg

[1] If a person develops malaria despite taking chemoprophylaxis, that particular medicine should not be used as a part of their treatment regimen. Use one of the other options instead.
[2] NOTE: There are 4 options (A, B, C, or D) available for treatment of uncomplicated malaria caused by chloroquine-resistant *P. falciparum*. Options A, B, and C are equally recommended. Because of a higher rate of severe neuropsychiatric reactions seen at treatment doses, we do not recommend option D (mefloquine) unless the other options cannot be used. For option C, because there is more data on the efficacy of quinine in combination with doxycycline or tetracycline, these treatment combinations are generally preferred to quinine in combination with clindamycin.
[3] Take with with food or whole milk. If patient vomits within 30 minutes of taking a dose, then they should repeat the dose.
[4] US manufactured quinine sulfate capsule is in a 324mg dosage; therefore 2 capsules should be sufficient for adult dosing. Pediatric dosing may be difficult due to unavailability of non-capsule forms of quinine.
[5] For infections acquired in Southeast Asia, quinine treatment should continue for 7 days. For infections acquired elsewhere, quinine treatment should continue for 3 days.
[6] Doxycycline and tetracycline are not indicated for use in children less than 8 years old. For children less than 8 years old with chloroquine-resistant *P. falciparum*, atovaquone-proguanil and artemether-lumefantrine are recommended treatment options; mefloquine can be considered if no other options are available. For children less than 8 years old with chloroquine-resistant *P. vivax*, mefloquine is the recommended treatment. If it is not available or is not being tolerated and if the treatment benefits outweigh the risks, atovaquone-proguanil or artemether-lumefantrine should be used instead.
[7] Treatment with mefloquine is not recommended in persons who have acquired infections from Southeast Asia due to drug resistance.
[8] When treating chloroquine-sensitive infections, chloroquine and hydroxychloroquine are recommended options. However, regimens used to treat chloroquine-resistant infections may also be used if available, more convenient, or preferred.
[9] Primaquine is used to eradicate any hypnozoites that may remain dormant in the liver, and thus prevent relapses, in *P. vivax* and *P. ovale* infections. Because primaquine can cause hemolytic anemia in G6PD-deficient persons, G6PD screening must occur prior to starting treatment with primaquine. For persons with borderline G6PD deficiency or as an alternate to the above regimen, primaquine may be given 45 mg orally one time per week for 8 weeks; consultation with an expert in infectious disease and/or tropical medicine is advised if this alternative regimen is considered in G6PD-deficient persons. Primaquine must not be used during pregnancy.

Department of Health

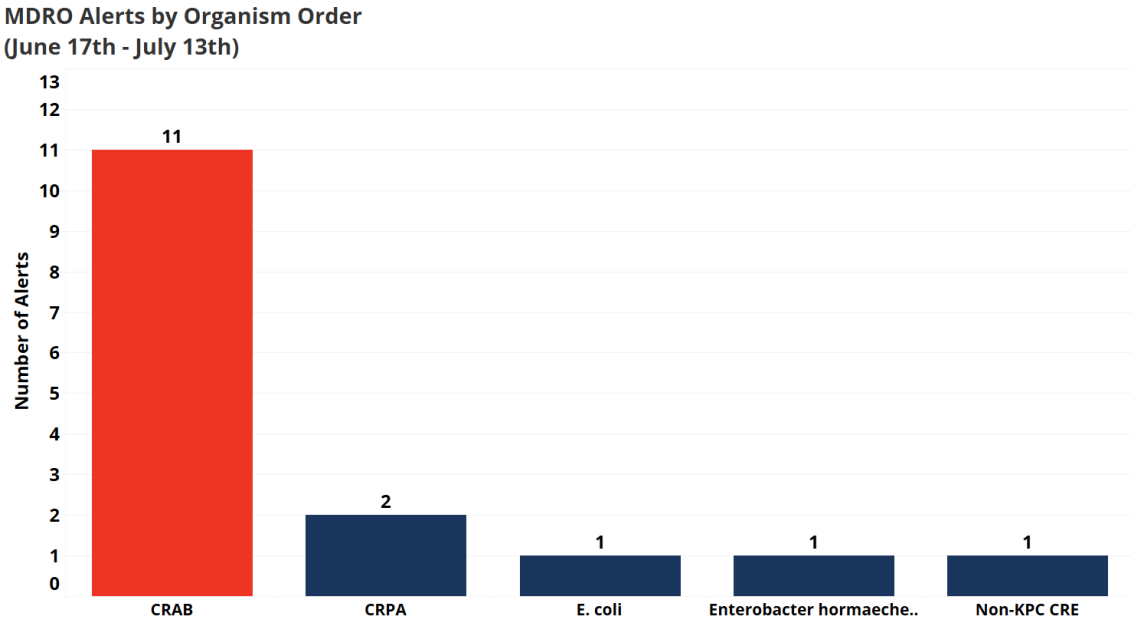
Multi-Drug Resistant Organism (MDRO) Outbreak Team Update

June 17th – July 13th, 2023

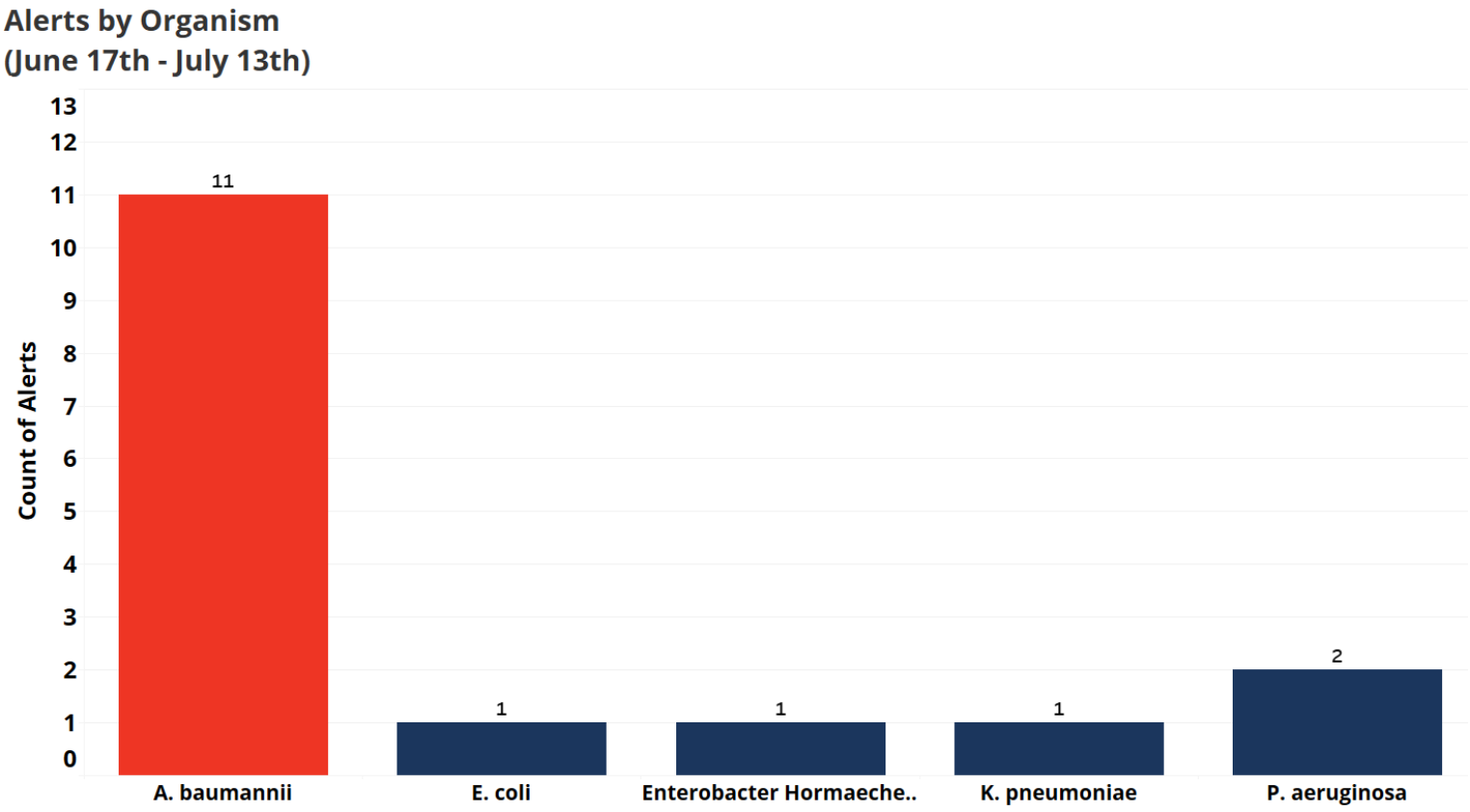
Cody Rocha, MPH

MDRO Alerts

- **CRPA –** Carbapenem-resistant *Pseudomonas aeruginosa*
- **CRAB –** Carbapenem-resistant *Acinetobacter baumannii*
- **CRE –** Carbapenem-resistant *Enterobacterales*
- **KPC –** *Klebsiella pneumoniae* Carbapenemase-producing

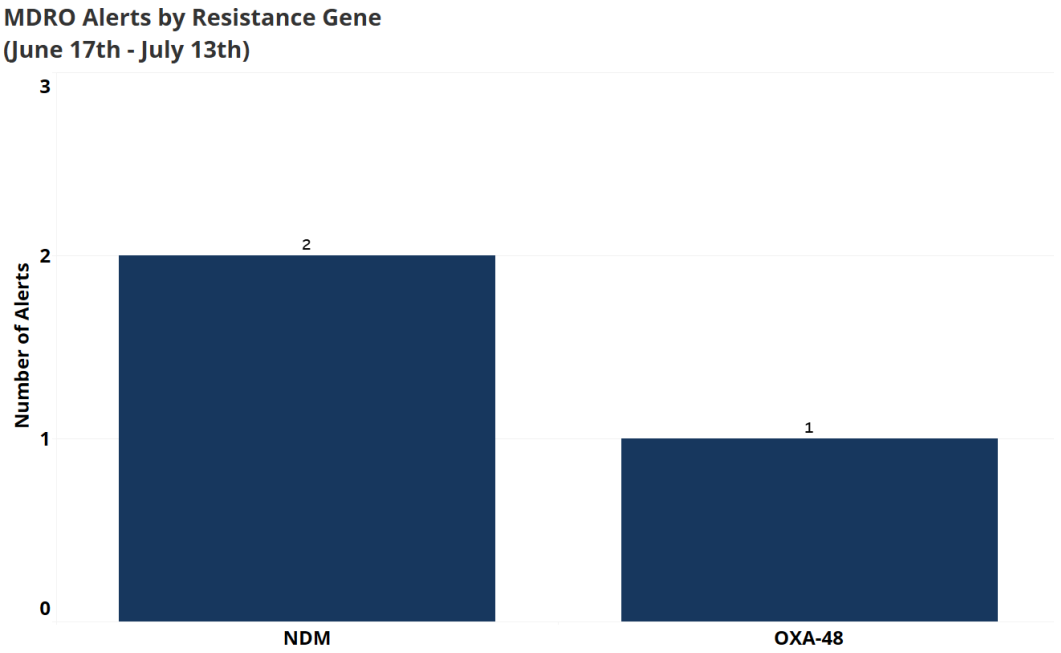


MDRO Alert Continued



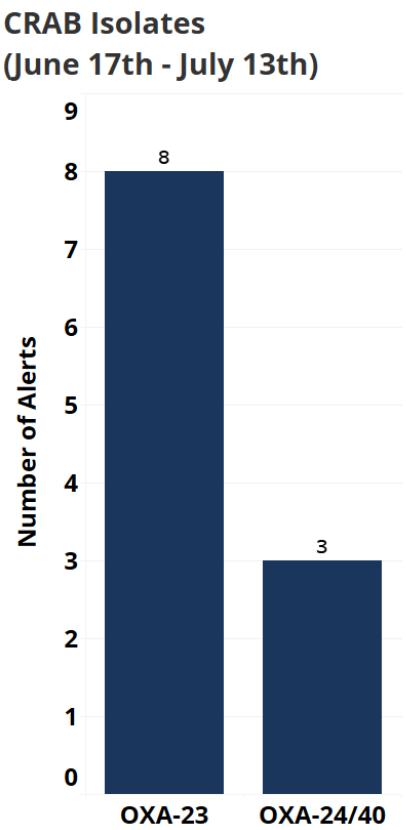
Non-KPC CRE Genes

- Carbapenemase-producing genes:
  - "Big Five"
    - KPC
    - IMP
    - NDM
    - OXA-48
    - VIM

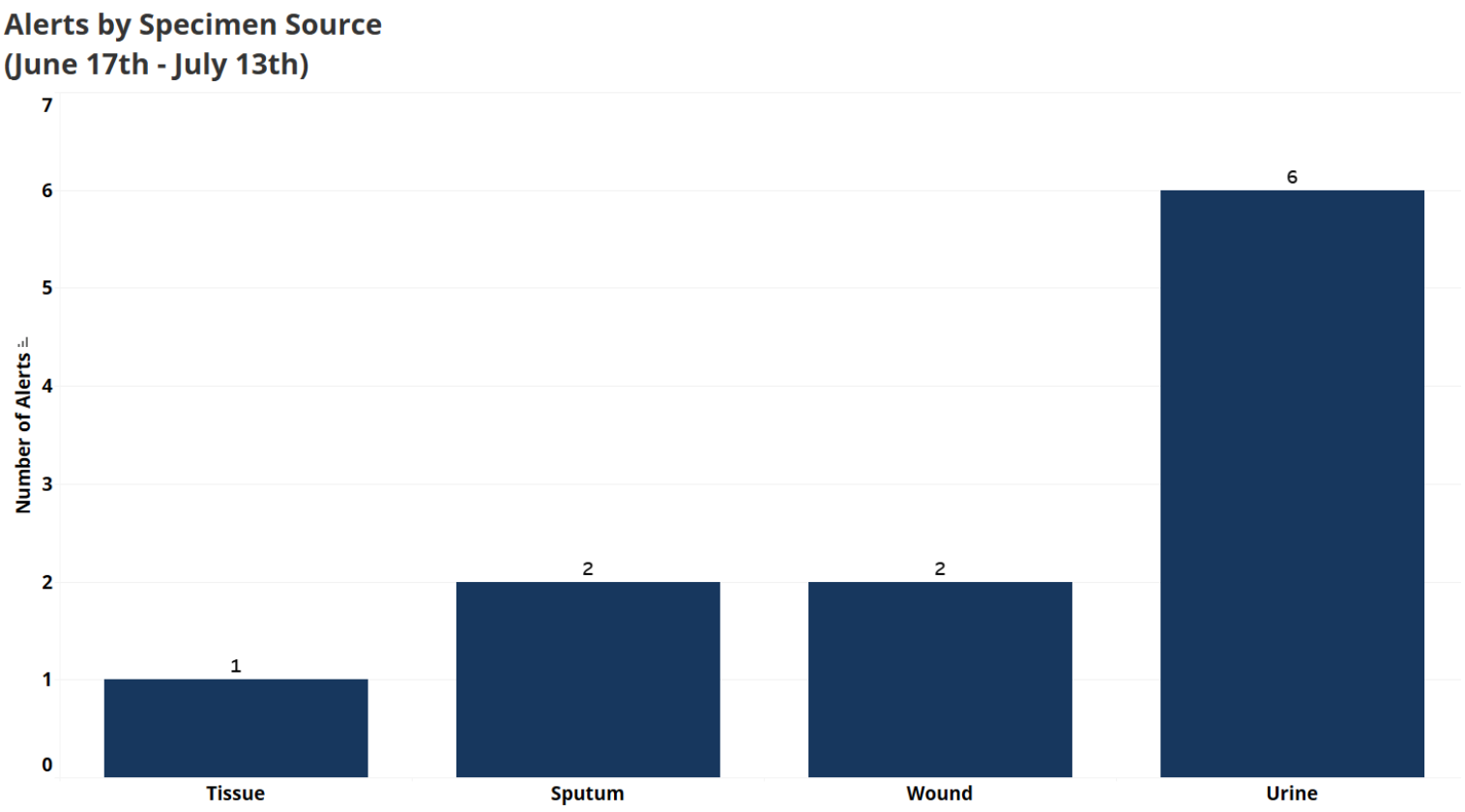


CRAB Alerts

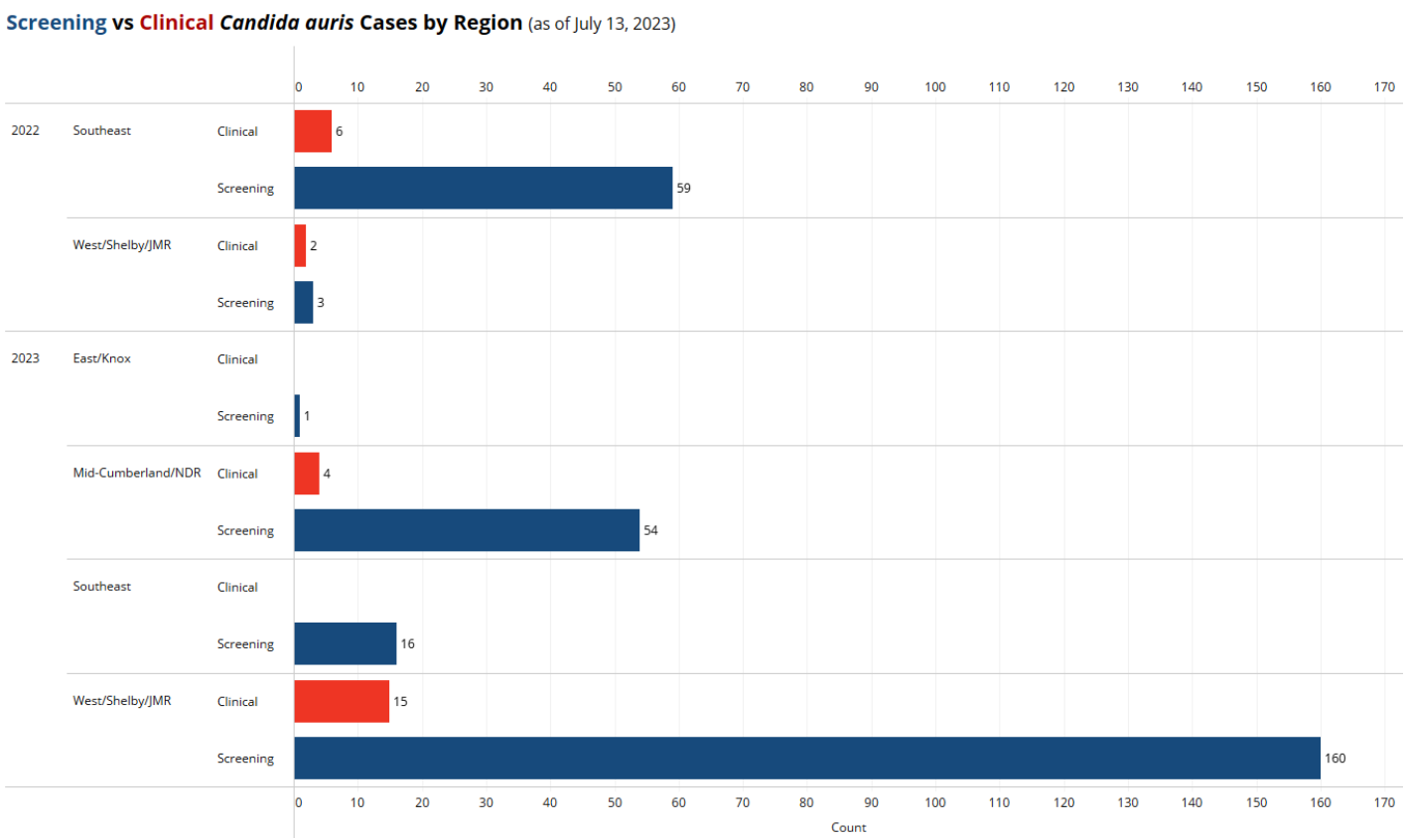
- Carbapenemase-producing genes:
  - Other Oxacillinases
    - OXA-24/40
    - OXA-23



Specimen Sources



C. auris Cases



TN MDRO Alerts for 2023

- For 2023
  - 105 CRAB specimens
    - 75 OXA-23
    - 30 OXA-24/40
  - 35 non–KPC CRE
    - 21 NDM
    - 2 IMP
    - 2 KPC, NDM
    - 2 KPC, VIM
    - 1 mCIM
    - 3 OXA-48
    - 1 VIM
    - 3 mCIM+/PCR-
  - *C. auris*
    - 27 Clinical cases
    - 277 Screening cases

Next NHSN User Call

- **Monday, August 21, 2023**
  - **10am CT / 11am ET**

- **NHSN Related**
  - **Vicky.Lindsey@tn.gov**
  - **Abigail.Marrero@tn.gov**

- **AU/AR Module**
  - **Christopher.Evans@tn.gov**

- **Infection Prevention**
  - **HAI.Health@tn.gov**