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Malaria Trends in Texas, 2013-2022

Amira Bashadi, MPH

Epidemiologist II | Epidemiology Team, Zoonosis Control Branch

Disease Surveillance and Epidemiology Section

Office of the Chief State Epidemiologist

Texas Department of State Health Services

February 16, 2024



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Objectives

- Malaria background
- Malaria trends in Texas, 2013-2022
- Malaria data - Texas, 2013-2022
- Preliminary malaria data – Texas and Region 11, 2023



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Malaria Background

- Disease caused by infection with a parasite, commonly from the bite of a mosquito.
 - Four kinds of parasites cause disease in humans: *Plasmodium falciparum*, *P. vivax*, *P. ovale*, and *P. malariae*.
 - Symptoms include fever, headache, vomiting, shaking chills, and other flu-like illness.
 - Onset is usually 7 to 30 days after infection.
 - Disease can be severe and fatal without treatment.
- Anyone living or traveling in malaria-endemic areas is at risk for infection (Greater risk in parts of Africa and Asia).
 - Preventive medication can greatly reduce the risk of infection.



An adult female *Anopheles quadrimaculatus*, seen here taking a blood meal, is capable of spreading the malaria parasite to humans. (CDC photo)

Malaria Trends in Texas, 2013-2022



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- From 2013-2022 there have been a total of 1,239 cases of malaria reported in Texas (range of 47-166 per year).
 - Of these, the majority, close to 98%, are acquired from international travel.
 - 17% of cases between 2013-2022 are *P. vivax* (inclusive of dual infections).
- Majority of cases (over 80%) between 2013-2022 were diagnosed in Texas by blood smear or PCR.



Blood smear from a patient with malaria; microscopic examination shows *Plasmodium falciparum* parasites (arrows) infecting some of the patient's red blood cells. (CDC photo)

Available at: https://www.cdc.gov/malaria/diagnosis_treatment/diagnostic_tools.html Accessed on: February 1, 2024.

Available from: NEDSS Accessed on: January 10, 2024.



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Malaria Data - Texas, 2013-2022

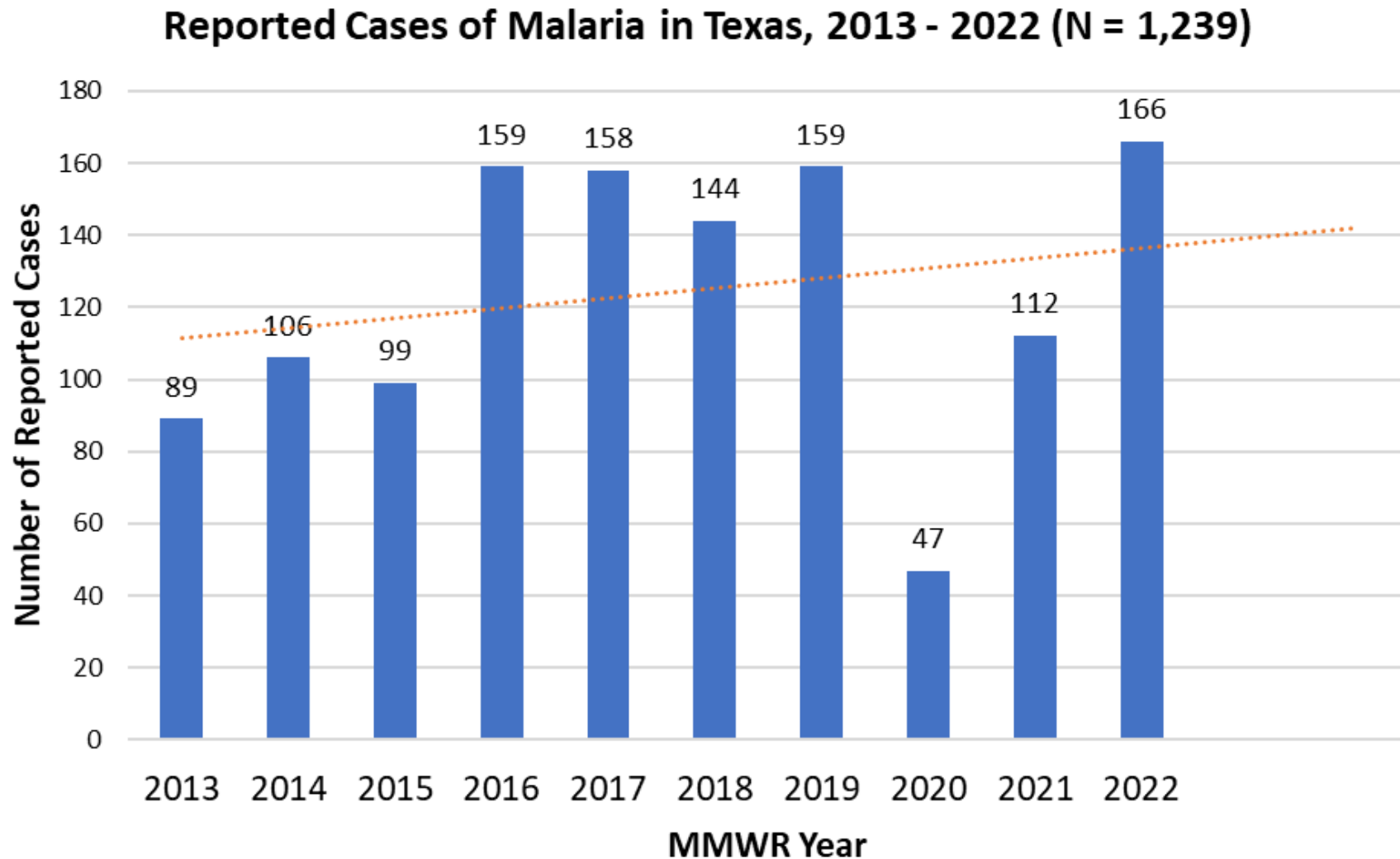
Annual Case Counts, 2013-2022



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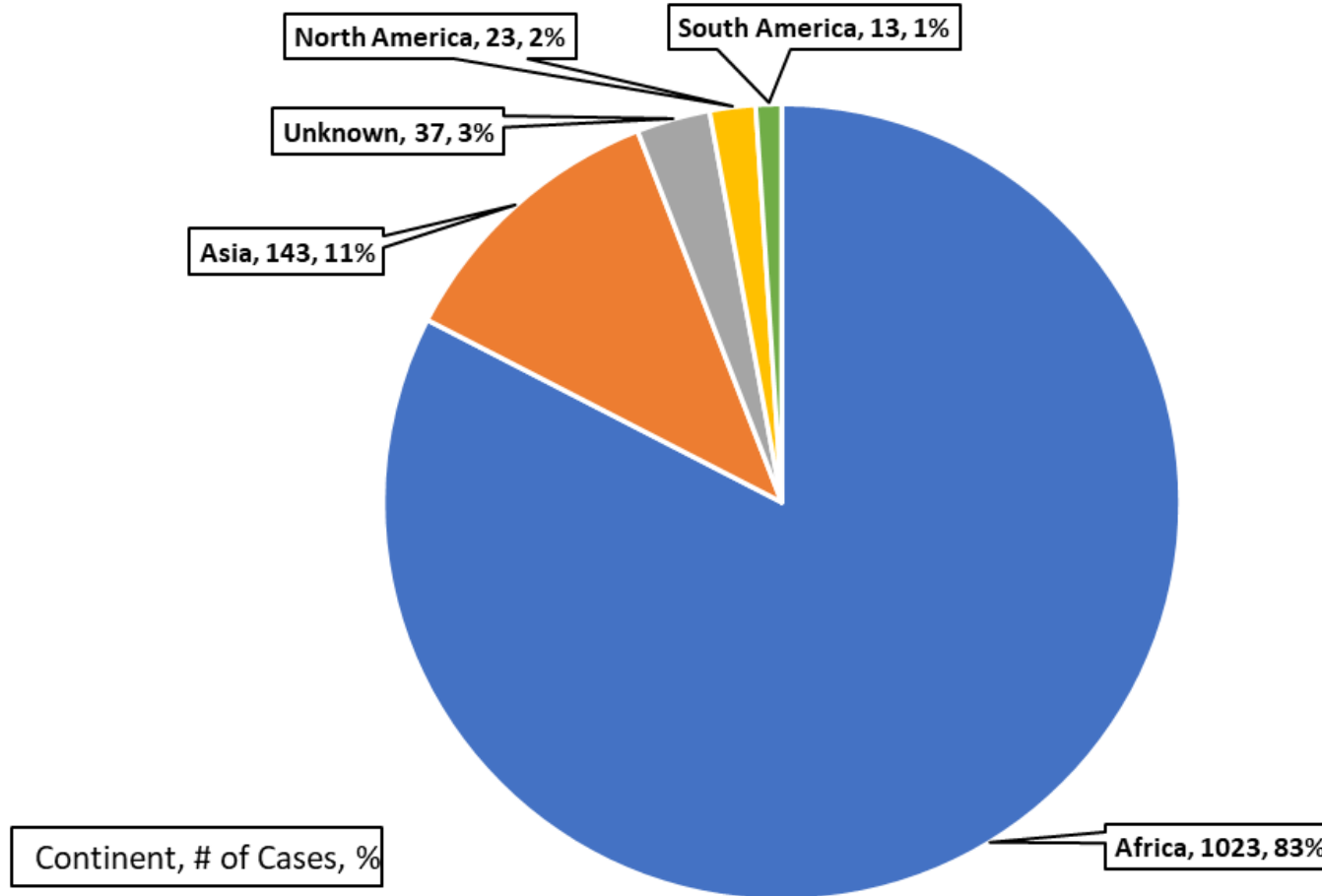
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Continent of Acquisition, 2013-2022

Reported Cases of Malaria by Continent of Acquisition,
Texas, 2013 - 2022 (N = 1,239)



Plasmodium Species, 2013-2022

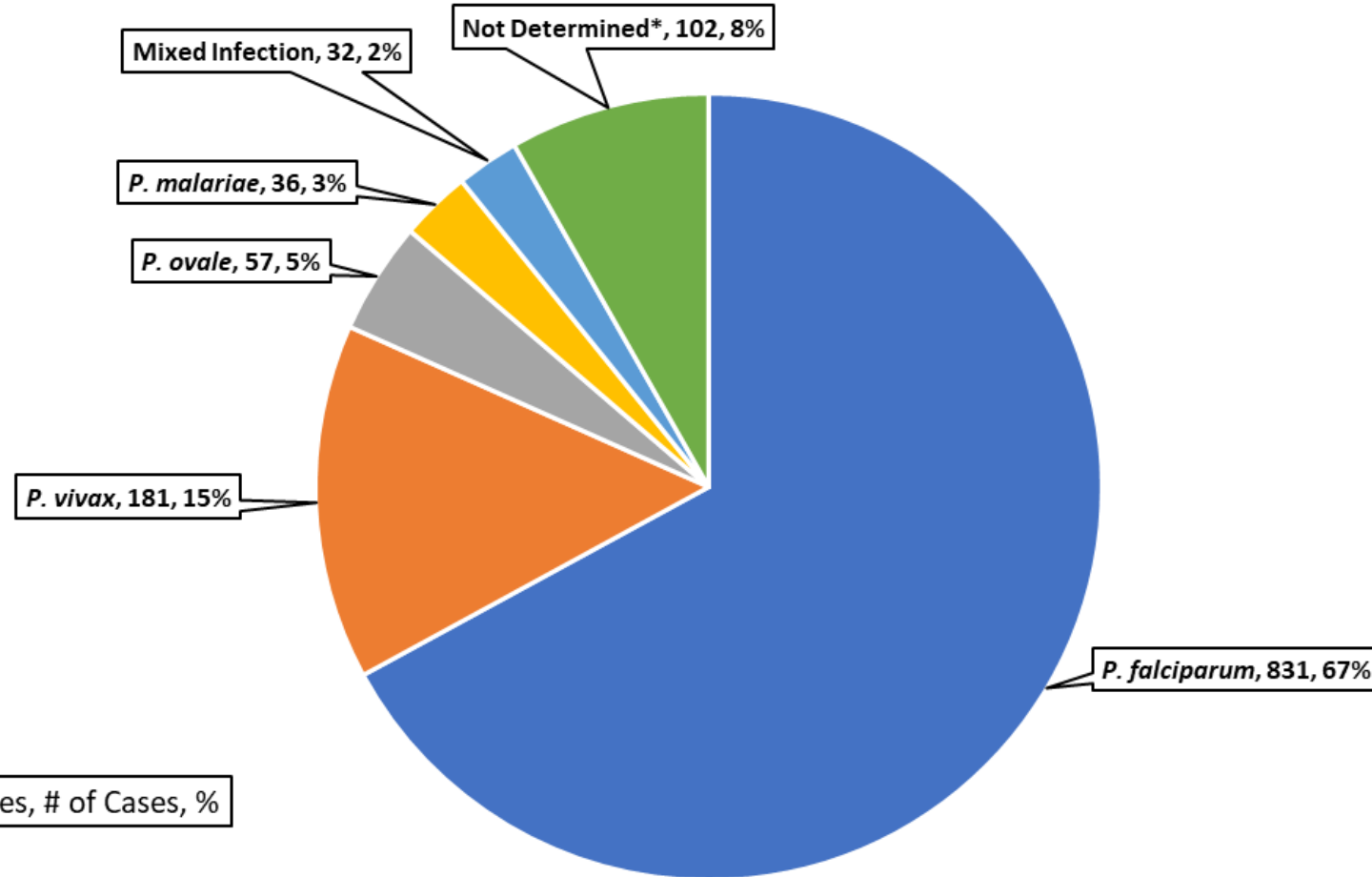


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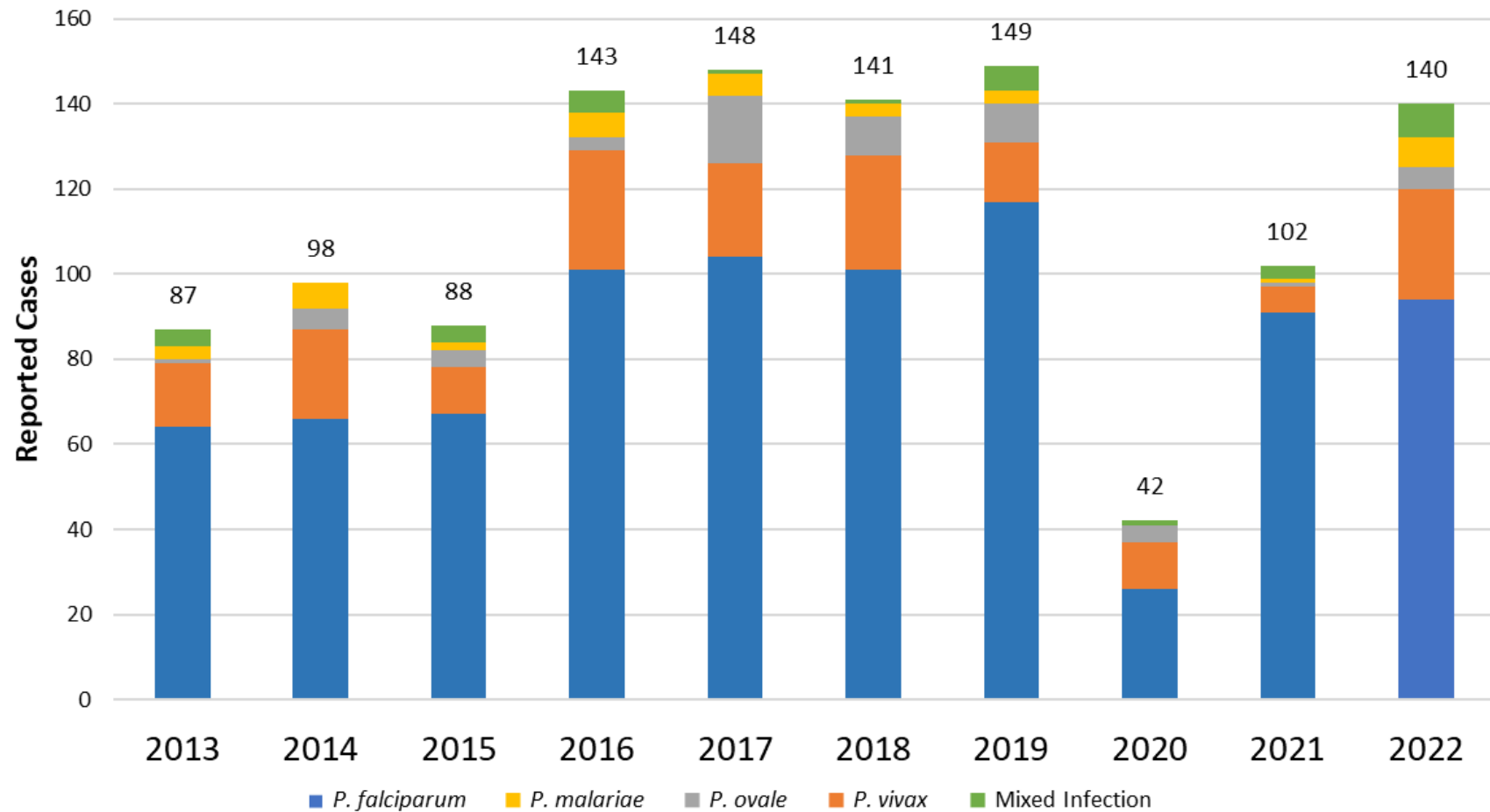
**Plasmodium Species Identified in Confirmed Malaria Cases,
Texas, 2013 - 2022 (N = 1,239)**



*Species was not determined in specimen

Plasmodium Species by Year, 2013-2022

Plasmodium Species* Identified in Confirmed Malaria Cases by Year,
Texas, 2013 - 2022 (N = 1,137)



*The *Plasmodium* species was not identified in 102 cases



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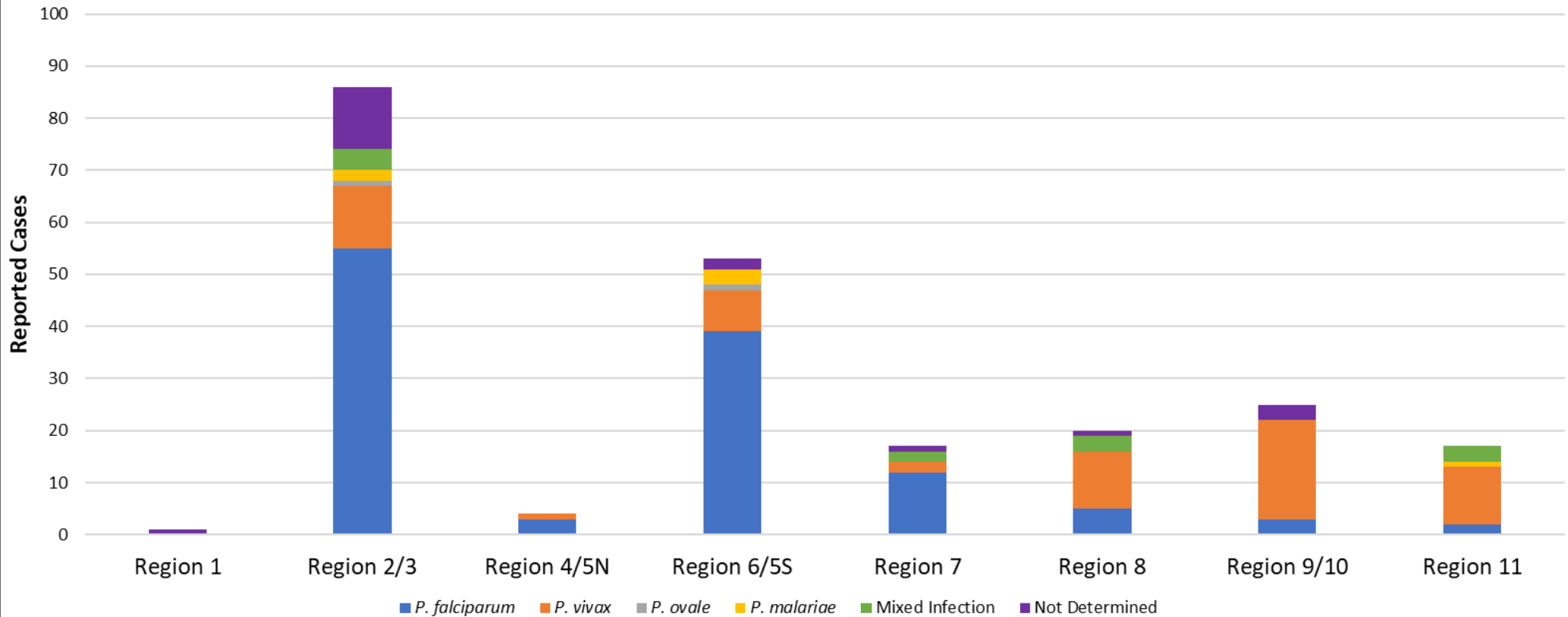
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Preliminary Malaria Data – Texas and Region 11, 2023

Plasmodium Species by Region, 2023*

Plasmodium Species Identified in Confirmed Malaria Cases by Region,
Texas, 2023* (N = 223)

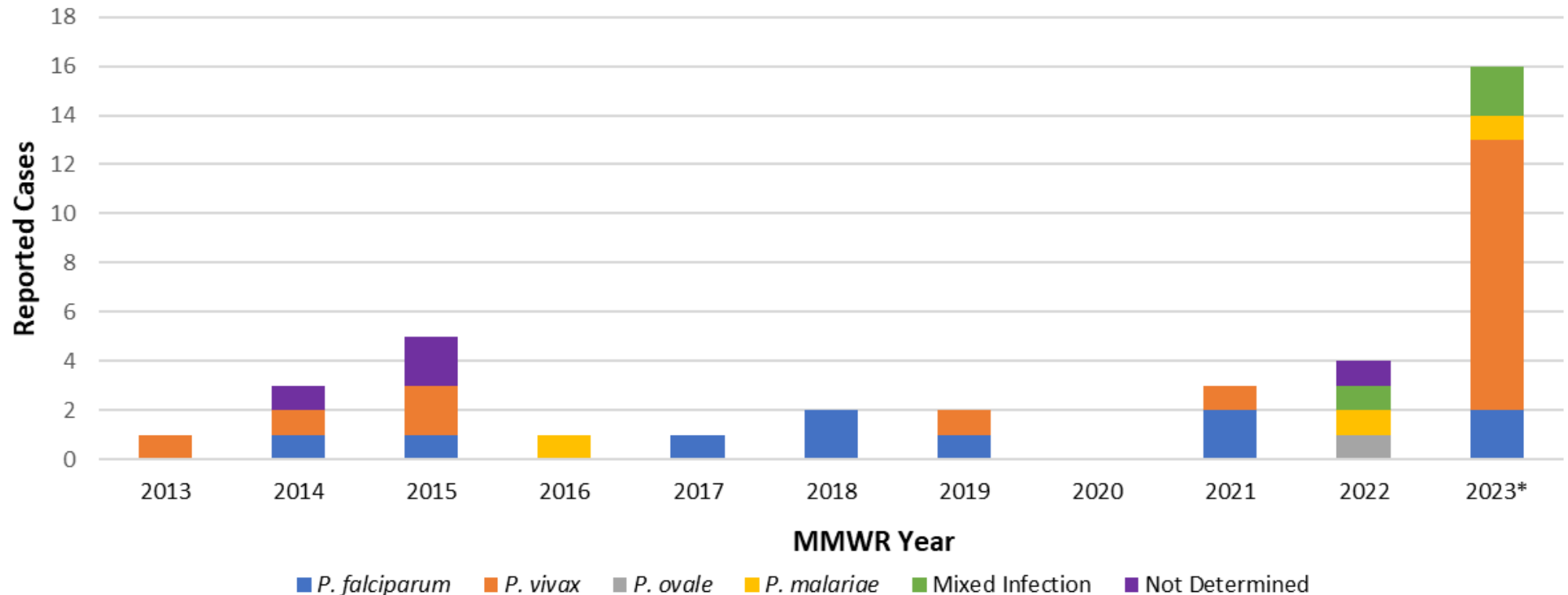


*Data are preliminary and subject to change.

Available from: [NEDSS](#) Accessed on: February 7, 2024.

Plasmodium Species by Year, Region 11, 2013-2023*

***Plasmodium* Species Identified in Confirmed Malaria Cases by Year, Region 11, Texas, 2013 - 2023* (N = 38)**



*Data are preliminary and subject to change.

Available from: [NEDSS](#) Accessed on: January 26, 2024.



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Thank you

Amira.Bashadi@dshs.texas.gov



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Malaria Case Investigation

Samantha Puttick
Region 4/5 North

Case Investigation

- Notified on 6/7/23
- Requested records from hospital
- Coordinated with hospital lab to get samples forwarded to CDC



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1st Interview 6/8

- Patient still very sick
- Focused on travel
 - No travel history
 - Has never left continental US
- Patient mentioned being seen at another hospital for this illness
 - Requested records



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Medical Course

- Symptom onset was 5/27
- Seen at 1st hospital 5/30
 - Headache
 - Nausea
 - Fever (100.8°)
 - Body aches
 - Lack of appetite
- Labs run
 - UA
 - CBC



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Medical Course

- Tests run
 - Influenza A & B
 - Strep A
 - COVID
- Discharged same day
 - Dx of Viral Syndrome
 - Ibuprofen 600MG for pain



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Medical Course

- Presented at 2nd hospital on 6/7
 - Fever (102.0°)
 - Nausea / Vomiting
 - Chills
 - Generalized Weakness
- Labs run
 - UA
 - CBC with auto differential



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Medical Course



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- Astute lab technician noticed malarial organisms on a smear
 - Pathologist didn't think they looked like falciparum
 - Suggested possibility of vivax or ovale
 - Low parasitemia (<5%)
- Hospital reached out to CDC for guidance

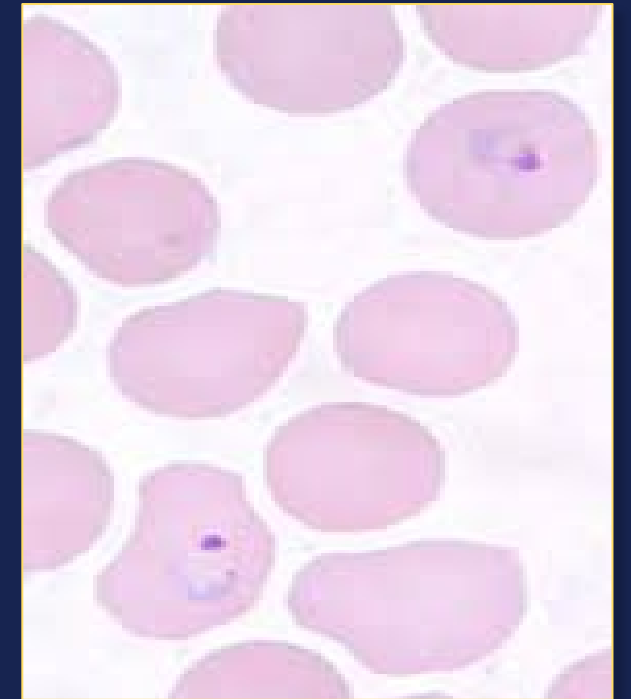


Image from CDC.gov

Medical Course

- Anti-malarial meds started evening of 6/7
 - Malarone (Atorvaquone/Proguanil)
 - Primaquine to be prescribed in future
- CDC reported results on 6/8
 - Plasmodium Vivax
 - Parasitemia 0.33%*
- Patient began to feel better afternoon of 6/8



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2nd Interview 6/12

- Felt much better
- Had been discharged on 6/10
- Conducted full interview
 - Worked overnight shift outside during May
 - Wore long sleeves and pants
 - Bitten multiple times by mosquitos
 - Did not wear repellent
 - Mentioned 4 co-workers were also experiencing similar illness



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Co-Worker Info

- Co-worker 1 lived out of state
 - Advised by DSHS to speak with their PCP about testing
- Co-worker 2
 - Contact information was incorrect. Lost to follow-up



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Co-Worker Info

- Co-worker 3
 - Arranged with DSHS to obtain testing
 - Results were negative
- Co-Worker 4
 - Recently had bloodwork done
 - Advised to see if it was still available for testing
 - DSHS also offered to provide testing.



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Co-Worker Symptoms

- Fever
- Diarrhea
- Nausea/vomiting
- Weakness
- Fatigue
- Mild respiratory symptoms
 - Congestion
 - Cough
- Gas
- Belching
- Indigestion



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Co-Worker Info

- 2 of 4 used DEET during their employment
 - One from the first day of employment
 - The other started 2 days after employment began
 - Both mentioned reduction in mosquito bites but were still bitten
- All 3 of the ones contacted recovered with no long-term side effects noted



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**Samantha Puttick
Public Health Region 4/5 North
2521 W. Front Street
Tyler, TX 75702
(903) 533-5260
samantha.puttick@dshs.texas.gov**

Cameron County's Response to an Autochthonous Malaria Case

Epidemiology and Laboratory Capacity (ELC) Workshop
Friday, February 16, 2024



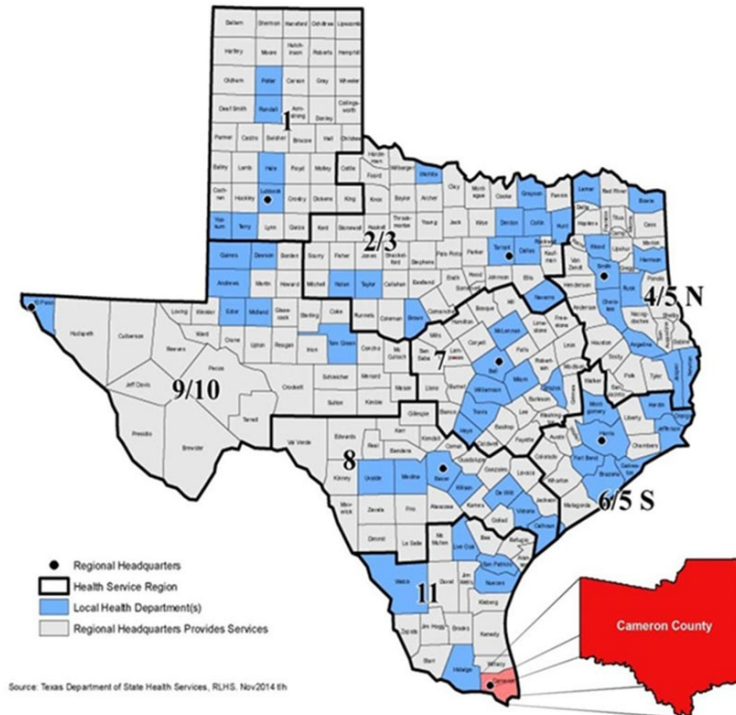
CAMERON COUNTY PUBLIC HEALTH

Esmeralda Guajardo, MAHS
Health Administrator

James W. Castillo II, MD
Health Authority

Cameron County

- Southernmost county in the state of Texas
- In Public Health Region 11
- Bordered by
 - Hidalgo County (West),
 - Willacy County (North),
 - the Gulf (East)
 - Mexico (South).

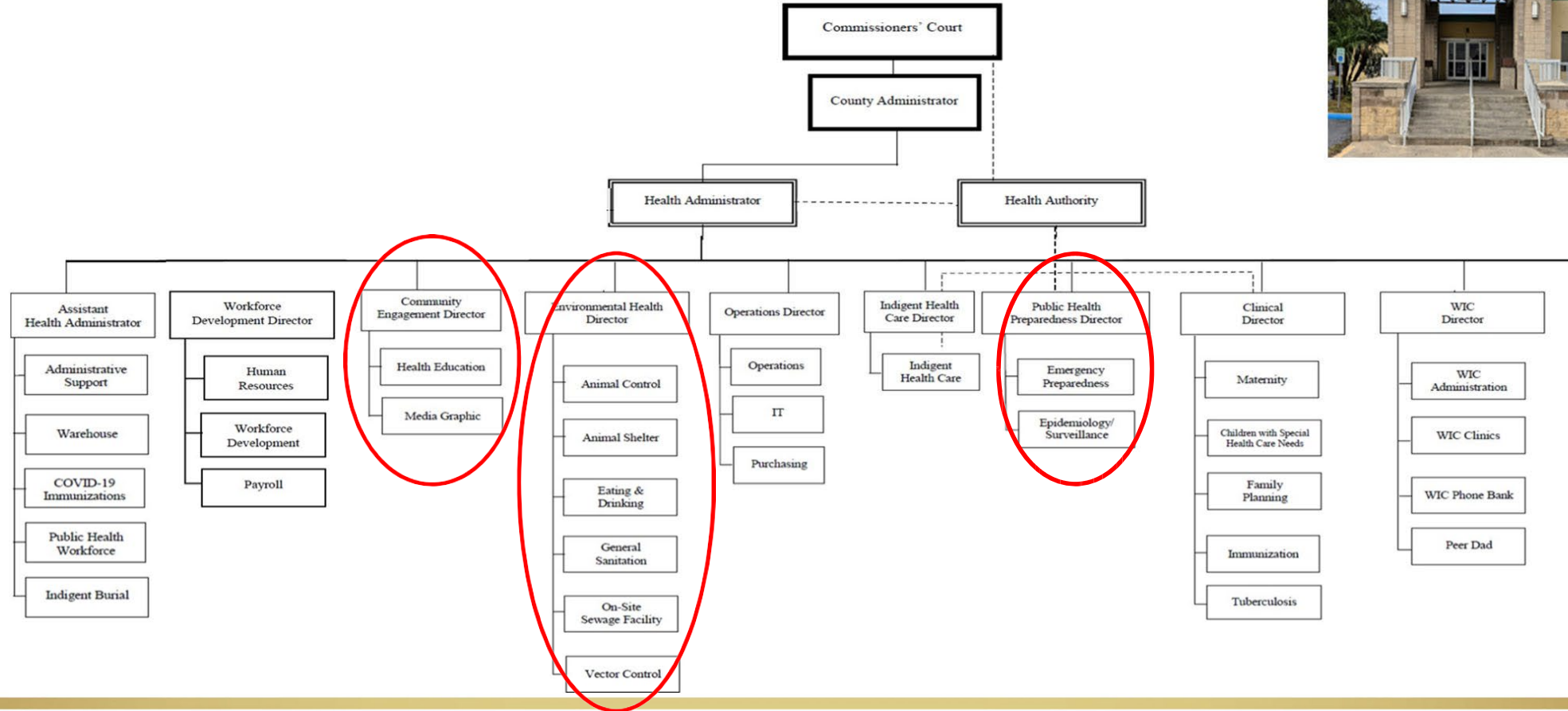
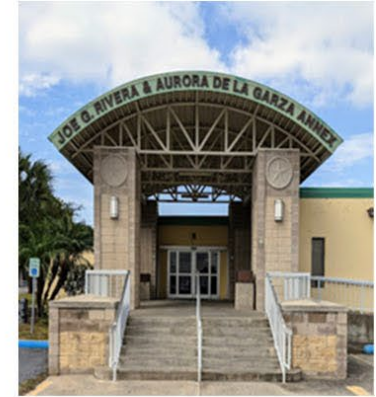


- Population - 421,017 (2021)
- Median Age – 32.6
- Median Household Income - \$50,649
- Poverty – 22.3%
- Employment Rate – 54.7%
- Education – 21.6% Bachelors Degree or Higher
- Without Health Care Coverage – 22.3%

Source: US Census Bureau,
https://data.census.gov/profile/Cameron_County,_Texas?g=050XX00US48061

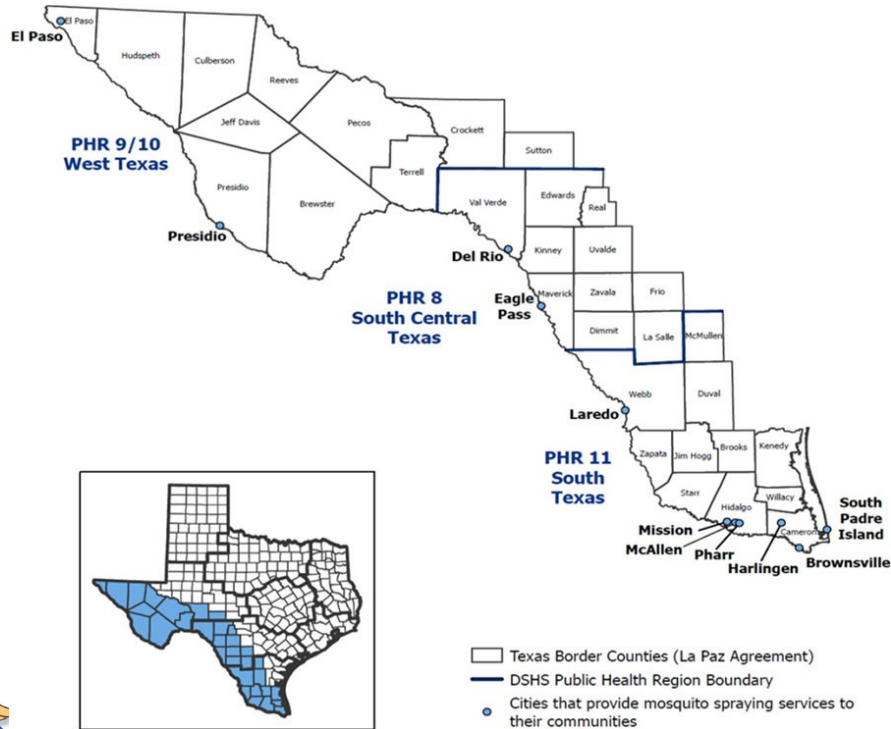


Cameron County Public Health



Municipalities with Vector Control

Municipalities with Vector Control Programs:



Municipalities with Vector Control Officials:

- **Brownsville**
- Combes
- **Harlingen**
- La Feria
- Laguna Vista
- Los Fresnos
- Port Isabel
- Primera
- Rio Hondo
- **South Padre Island**



Epidemiology and Surveillance

- June 9, 2023 (Friday)

- CCPH received initial notification from DSHS Region 11 Zoonosis Control Program
- DSHS calls for TEAMS meeting with Cameron County Public Health and City of Brownsville to inform everyone of case and discuss next steps.

- June 12-16, 2023

- Identified vector surveillance/spraying target locations
- Sent Vector Surveillance Recommendation Form (w/maps) to EH Program
- Requested medical records from local hospital and provided them to Brazoria Co. via the regional office.

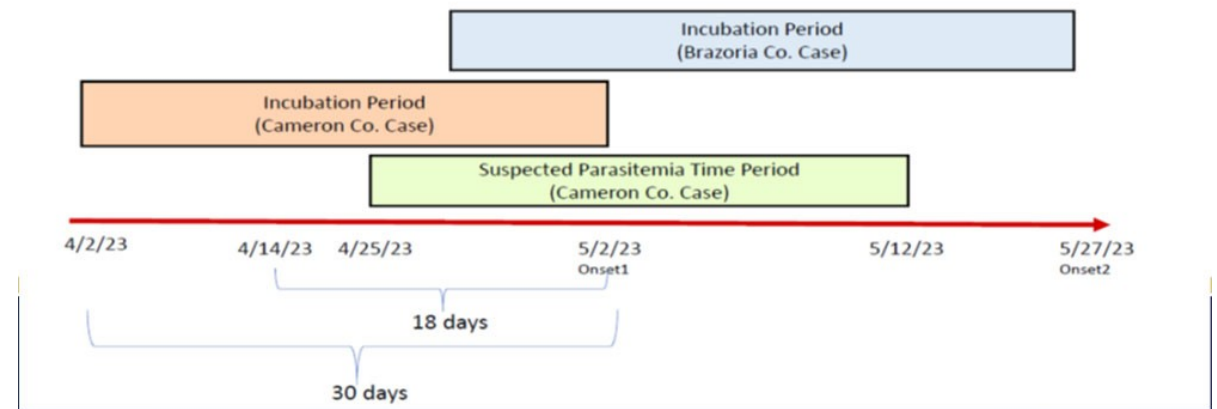


Epidemiology and Surveillance

- June 12-16, 2023 Con't

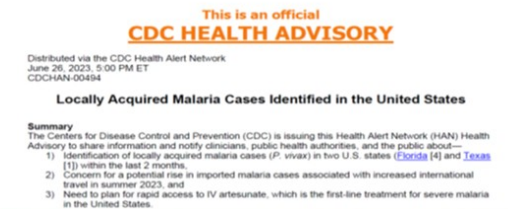
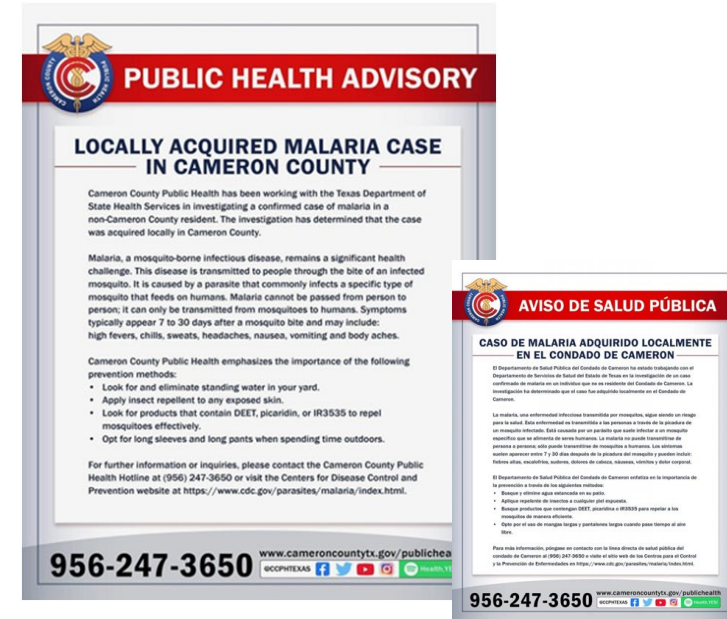
- Identified an imported case of malaria (symptom onset of May 2) that was previously reported in the same area where the patient with autochthonous infection could have likely been exposed.
- Worked with hospital laboratory to send smear on imported malaria case to the DSHS Parasitology lab in Austin so they could forward to CDC.
- Results from CDC received June 16th. *P. vivax* identified.

Time Line and Suspected Incubation Period



Epidemiology and Surveillance

- June 23, 2023
 - CPH released Public Health Advisory
 - Shared via email to IPs, Blackboard to healthcare providers, and posted on website and social media
 - Shared Texas DSHS Health Advisory
- June 26, 2023
 - Shared CDC Health Advisory



Epidemiology and Surveillance

- Additional Activities (June/July)
 - Shared updated clinical guidance and algorithms with IPs and healthcare providers
 - CDC COCA Call on Malaria Diagnosis and Treatment
 - Ongoing surveillance



Education and Social Media

- Community Engagement Program
oHealth Educators
- Website – Public Health Advisory
<https://www.cameroncountytexas.gov/publichealth/>
- Social Media

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Malaria Campaign Metrics

Platform	Metric
Website	159,700 Impressions
Social Media	40,392 reach and engagements



Social Media



* Posted July 2023



* Posted Sept. 2023

- Infographics on Facebook



- Awareness Videos/Reels (Aug 2023)

YouTube:

Eng: [Malaria Advisory](#) Span: [Aviso de Malaria](#)



- Podcast (Sept. 2023)

YouTube:

[Health, YES! – Episode 8](#)

Spotify:

[Health, YES! – Episode 8 \(Spotify\)](#)



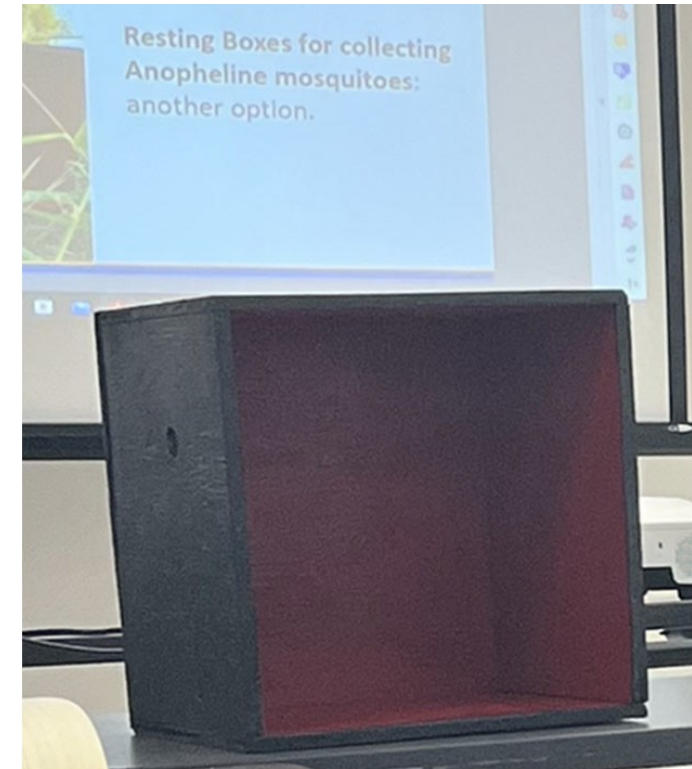
Vector Control and Surveillance

- Partners

- CCPH Environmental Health Program
- Vector Control Programs from Municipalities

- Activities

- Vector Control
 - Adulticiding
 - Larvaciding
- Anopheles spp. Surveillance
 - Mosquito Traps
 - Resting Boxes – Training provided by DSHS
 - Mosquito landing rate counts
- Information/Education



Vector Control and Surveillance

- Three target sites identified
 - Target Site #1 (Worksite)
 - Set up CDC light traps
 - Set up Resting Boxes
 - Adulticided
- * Prior to event had adulticided 5x in May

Anopheles spp. surveillance target site # 1 –



Target Site #1 – Enhanced Surveillance

- 1 mile radius (~2 mile diameter)
- Light traps
 - Set-up ~5x btwn. June 14th–July 5th
 - Set-up at 6AM
 - Picked up at 7AM
 - Baited with Co2
- Adulticide Treatment
 - Sprayed 3 times btwn. June 16th-30th
 - Sprayed in the morning hours



Target Site #1 – Enhanced Surveillance

- Resting boxes set up at 5AM and picked up at 10AM with aspirators



Target Site #1 – Enhanced Surveillance

- Total mosquitoes caught = 2,888 in 5 batches
 - Anopheles species
 - 129 adult mosquitoes (~4.5%)
 - Sent to CDC for malaria testing
 - All negative for the malaria parasite.



Target Sites 2 and 3

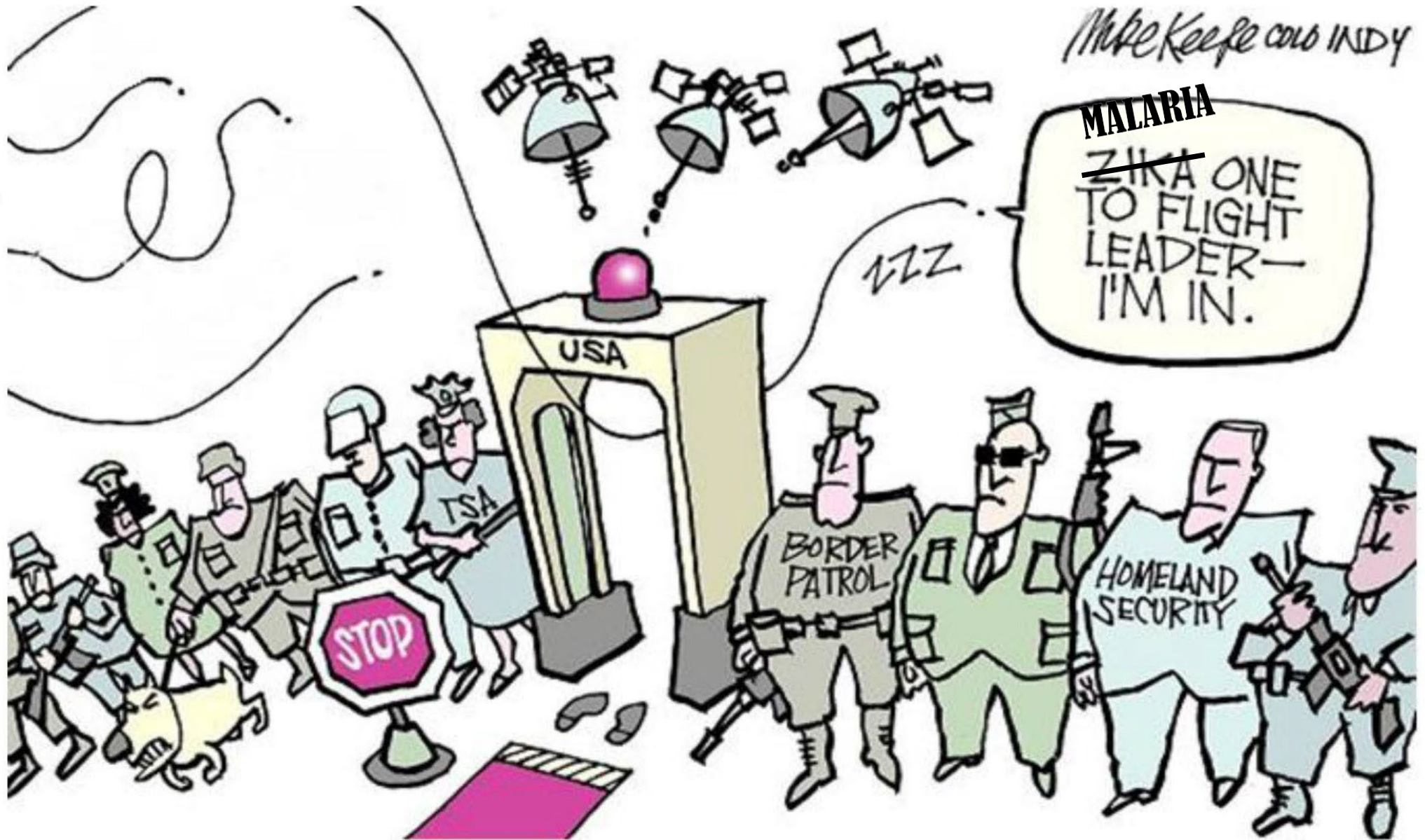
- Target Site #2 (temp. residence)
 - Set up BG-Sentinel traps
 - Performed landing rate counts
 - Adulthood
 - * Prior to event had larviced (1x) and adulticed (2x) in May
- Target Site #3 (temp. residence of pt. with imported malaria)
 - Set up traps
 - * Prior to event had adulticed 5x in May

Anopheles spp. surveillance target site # 2 –



Anopheles spp. surveillance target site # 3 –





Acknowledgments

- *CDC Parasitic Diseases Branch*
- *Texas DSHS Zoonosis Control Branch*
- *Texas DSHS Entomology, Parasitology, and Molecular Labs*
- *Texas DSHS Region 4/5N, 6/5S, and 11*
- *Brazoria County Health Department*
- *Cameron County Public Health*
- *City of Brownsville*
- *City of Harlingen*
- *City of Los Fresnos*



Thank You

Raquel Castillo, MPH
Chief Epidemiologist
Cameron County Public Health
rcastillo@co.cameron.tx.us



Cameron County Public Health
Public Health Preparedness Program
1390 W. Expressway 83
San Benito, TX 78586

Ph: (956) 247-3625 or (866) 326-3397

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Mosquito Surveillance and Control Activities

Leigh-Anne Lawton, Medical Entomologist
Zoonosis Control Branch
Texas Department of State Health Services



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Surveillance - Adult Traps



Photo credit: Leigh-Anne Lawton, Zoonosis Control Regional Medical Entomologist

Surveillance - Adult Traps



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Surveillance - Adult Resting Sites

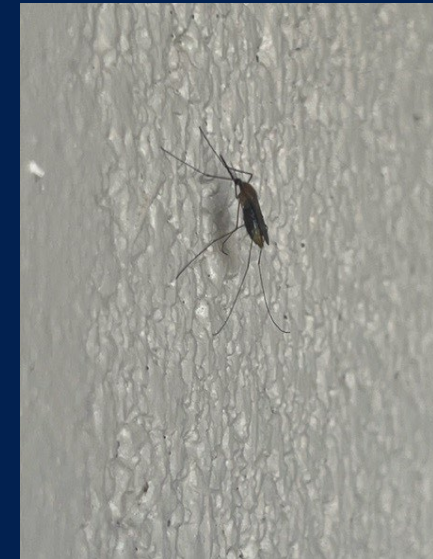


Photo credit: Leigh-Anne Lawton, Zoonosis Control Regional Medical Entomologist

Surveillance - Larval Habitats



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Photo credit: Leigh-Anne Lawton, Zoonosis Control Regional Medical Entomologist

Chemical Spraying



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Photo Source: kbtv

Photo credit: Leigh-Anne Lawton, Zoonosis Control Regional Medical Entomologist

2023 Malaria Response Agencies



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- CDC Parasitic Diseases Branch
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- Texas DSHS Entomology, Parasitology, and Molecular Labs
- Texas DSHS Regions 4/5N, 6/5S, and 11
- Cameron County Public Health
- City of Harlingen
- City of Los Fresnos
- City of Brownsville
- Brazoria County Health Department



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