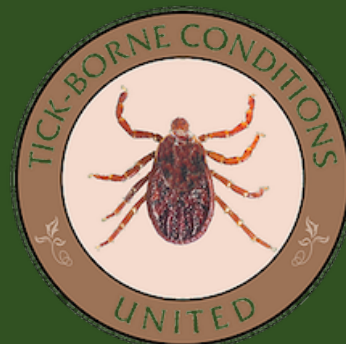


Ticks and Tick-borne Diseases in Chatham County

“Tick Central”



Jennifer Platt, DrPH
Director of Research and Programs
TBCUnited.org





8

6

5,000

899

4

12





Possible Tick-borne Diseases & Conditions in NC

- ❖ **Alpha-gal Syndrome** (*cause unknown*)
- ❖ **Anaplasmosis*** (*Anaplasma phagocytophilum*)
- ❖ **Babesiosis***
- ❖ **Ehrlichiosis*** (*Ehrlichia canis, chaffeensis, ewingii*)
- ❖ **Lyme disease*** (*Borrelia burgdorferi s.s.*, and *bissettii, andersoni*, and other that can cause Lyme-like cases in humans)
- ❖ **Southern Tick Associated Rash Illness = STARI** (*source unknown*)
- ❖ **Spotted fevers** (SFGs: *Rickettsia rickettsii, parkeri, amblyommatidis*)
- ❖ **Tick paralysis** (caused by a tick neurotoxin) - now rare
- ❖ **Tick Relapsing Fever** (*Rickettsia miyamotoi*)
- ❖ **Tick virus** (Powassan virus, Heartland virus)
- ❖ **Tularemia*** (*Francisella tularensis*)



Lonestar Tick

(*Amblyomma americanum*)



- **The Lone Star tick is currently the most important pest and vector tick species in NC**
- All life stages bite humans. Larval bites confused with chiggers.
- **Distribution in NC:** Extremely common in eastern half of the state. Distribution is spreading north and west.
- **Transmits:** Rickettsia (at least six known SFG species), Ehrlichiosis, Southern Lyme (STARI), Tularemia, Heartland virus (found in NC deer but in humans in other states), Tick Paralysis, and Alpha-gal Syndrome.



 Tick Encounter

Lone Star Tick (*Amblyomma americanum*)



Larva



Nymph



Adult Male



Adult Female

The Lone Star Tick is one of several known ticks worldwide associated with Alpha-gal Syndrome (AGS).

Adult, nymphal, and larval ticks attached to ear of a sika deer. Deer have been known to have more than 500 ticks on them.

Normal reaction to Lone Star tick bite



Multiple larval Lone Star tick bites

Erythema migrans

- Lyme: 20-40% do NOT develop EM
- 'Bull's eye' is a misnomer
 - More rashes are solid than not
- No data for proportion with EM in STARI
- Lyme vs STARI EMs: cannot be distinguished
- EM rashes have many appearances



EM rash, post black-legged tick bite



EM rash, 11 days post lone star bite

Photos from TIC-NC's files



nyc.gov



Black-legged Tick

(also called Deer Tick)

Ixodes scapularis



- **ACTIVE** in FALL/WINTER
- **Distribution in NC**: primarily in the coastal plain and Piedmont counties, but now moving into the mountains from the north.
- **Transmits**: Lyme/Lyme-like *Borrelia* pathogens, Babesiosis, Ehrlichiosis, **Bartonella**; possibly Powassan Encephalitis and Tick-borne Encephalitis (viral).



American Dog Tick

Dermacentor variabilis



- Only adults bite people.
- **Distribution in NC**: Statewide; previously very common, now uncommon possibly due to topical treatments on dogs; can be found inside
- **Transmits**: Spotted fevers (RMSF *R. rickettsii*, *R. amblyommatis*), Tularemia, Ehrlichiosis, Tick paralysis





TICKBORNE DISEASES

IN NORTH CAROLINA
and CHATHAM COUNTY

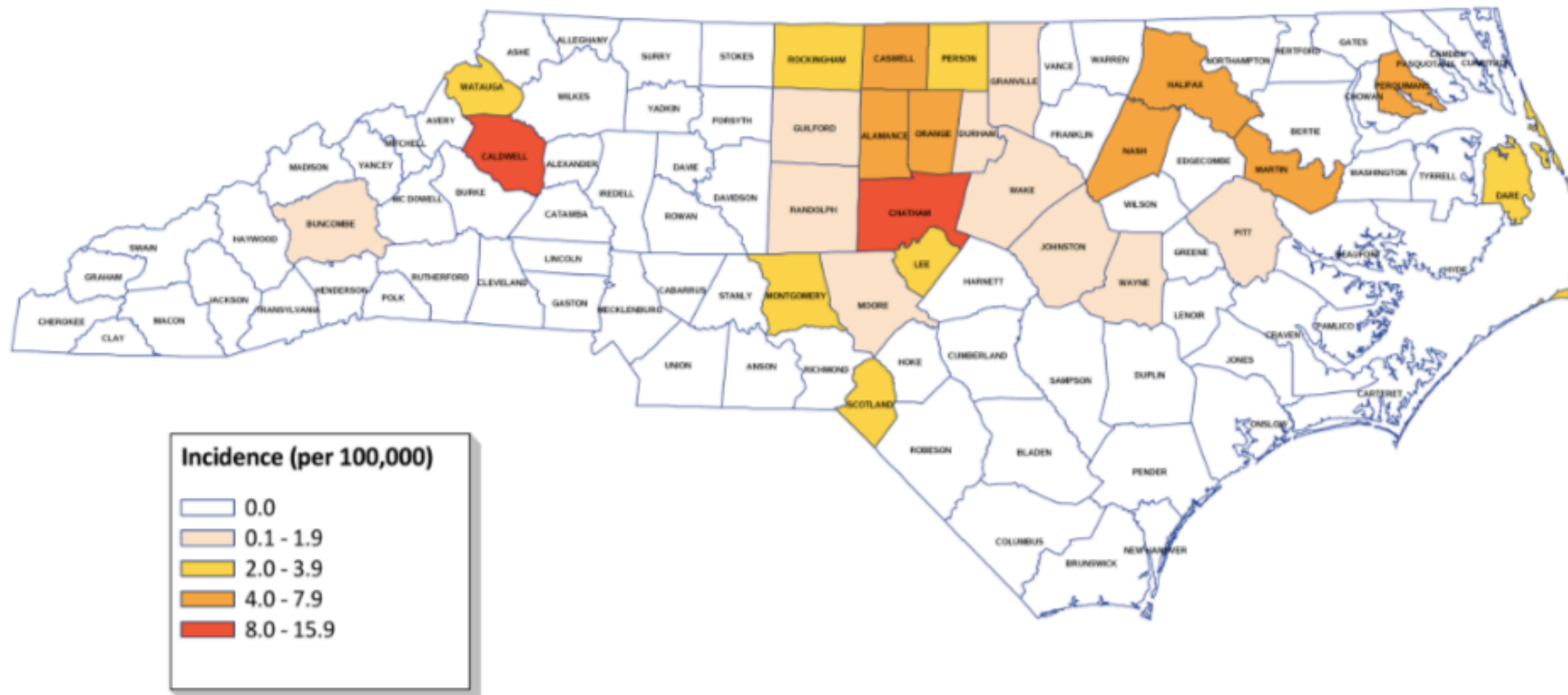


Rickettsias (SFGR):
NC: 1.8; Chatham: 25.6 (14x NC rate)
US: 1.5; Chatham: 25.6 (17 x US rate)

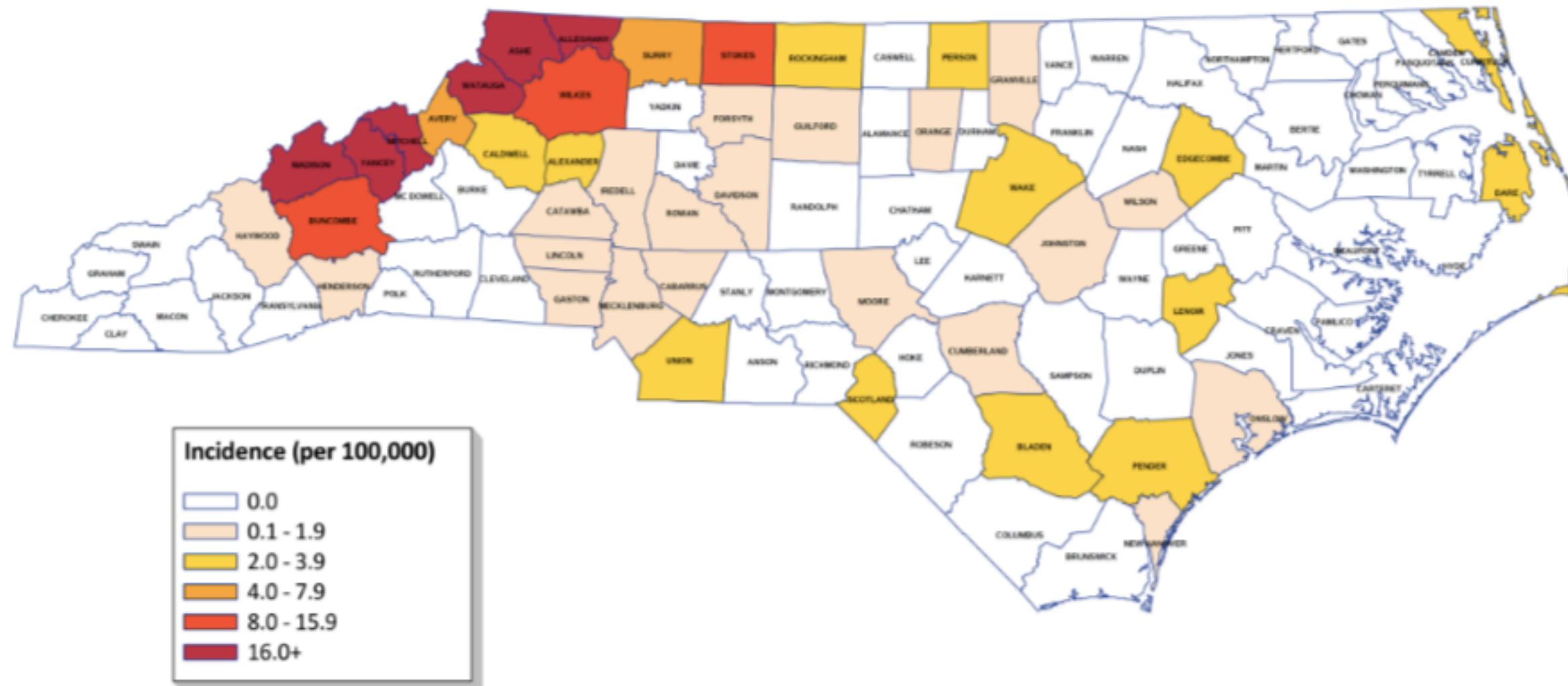
Ehrlichiosis:
NC: 1.0; Chatham: 21.6 (22x NC rate)
US: .7; Chatham: 21.6 (31x US rate)

Alpha-gal Syndrome:
Unknown, although one survey found 3% (~2,250) in Chatham county

Confirmed and Probable Incidence of Ehrlichiosis Cases by County of Residence, NC, 2022



Confirmed and Probable Incidence of Lyme Disease Cases by County of Residence, NC, 2022





Alpha-gal Syndrome

The Mammalian “Carbohydrate” Allergy

The Lone Star Tick is one of several known ticks worldwide associated with Alpha-gal Syndrome (AGS).



AAAAI American Academy of
Allergy Asthma & Immunology
ANNUAL MEETING
SAN ANTONIO, TX · FEBRUARY 24-27, 2023

TBCU IN THE NEWS



NEW STUDY: TICK BITES PROVEN TO BE RISK FACTOR FOR ALPHA-GAL SYNDROME



Patients with Alpha-gal Syndrome (AGS) have long suspected that their allergy was caused by a tick bite, but it has been difficult to validate scientifically. TBCU CoFounder Dr. Jennifer Platt contributed a "Perspective" on the recent Healio summary of a case-control study led by Dr. Scott Commins and others from UNC.

5 Things To Know About AGS

1

Reactions are usually delayed, up to 8 hours

2

Reactions are variable

3

Reactions may involve all body systems

4

Test positivity does not correlate with reaction severity

5

Up to 20% of patients do not recall a tick bite



Tick-Borne
Conditions United

Symptoms of AGS

- Hives (urticaria)
- Anaphylaxis (a potentially deadly reaction that restricts breathing)
- Angioedema (similar to hives, but at deeper layers of the skin)
- Gastrointestinal distress (e.g. diarrhea, acid reflux, upset stomach, vomiting)
- Rapid decrease in blood pressure
- Swelling of the lips, face, tongue and throat, or other body parts
- Atypical chest symptoms



Tick-Borne
Conditions United

AGS can be life-altering and life- threatening.

“Because of my airborne reactions, I was forced out of a job I had had for over twenty years. People simply do not understand the life-altering consequences of this 'condition.'” — L. Lay

“My workplace put me in a building by myself to avoid potential exposures. I would rather have cancer because at least there's a cure.” — name withheld



Tick-Borne
Conditions United

TBCUnited.org

- Test positivity does not correlate with reaction severity
- Quicker reaction time is significantly associated ($p < .0001$) with lower blood test results.

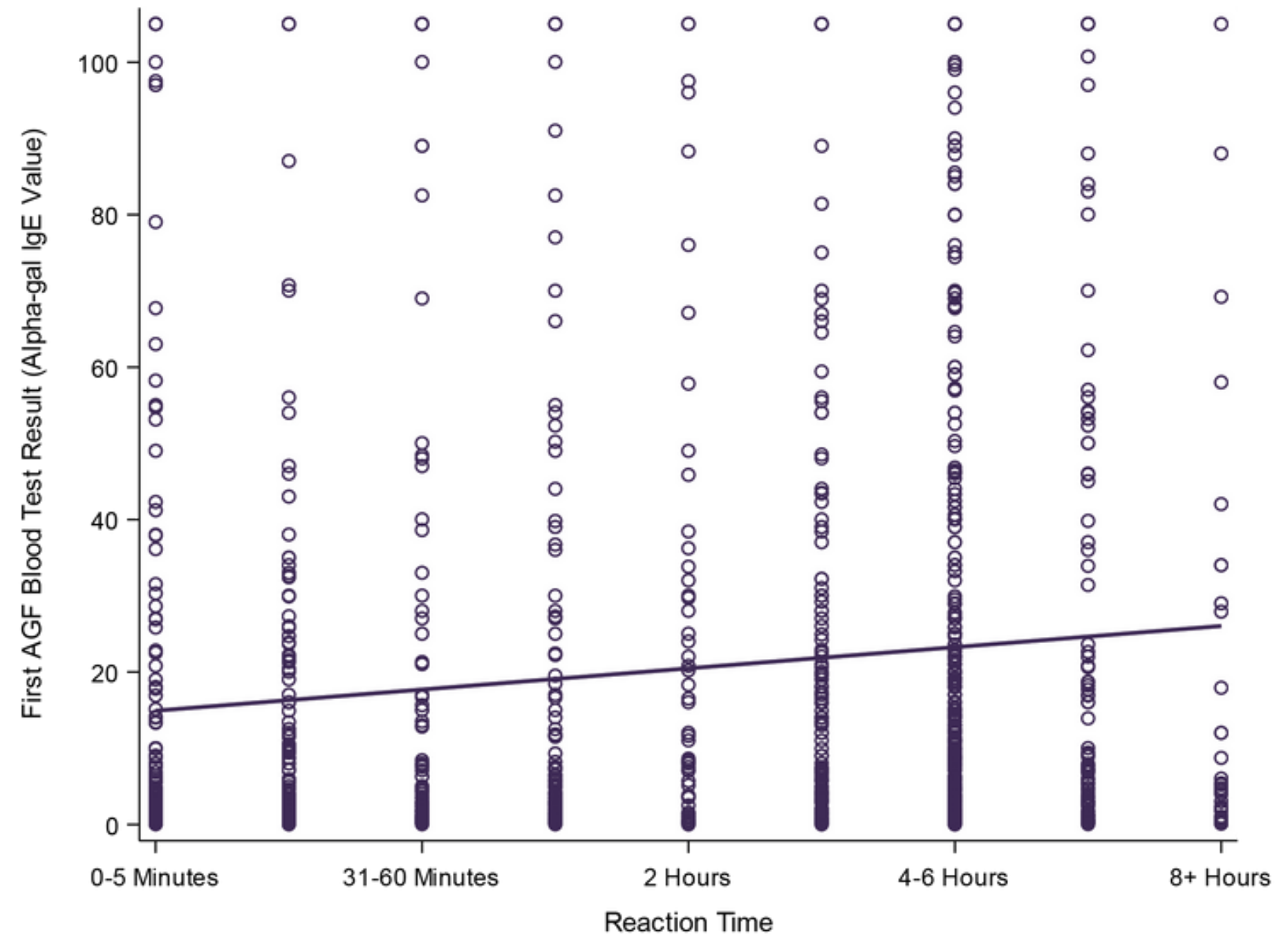


Figure 1. Patient Reported Alpha-gal IgE Blood Test Results vs. Time to Reaction

**If you
think you
may have
AGS...**

Ask your healthcare provider to use the
Viracor AGS CARBOHYDRATE test listed here:

Galactose-alpha-1,3-galactose (Alpha-gal) IgE
Viracor Test Code: 30039 / Lab Corp: 650003

Viracor Eurofins Clinical Diagnostics
(800) 305-5198

CAUTION:

The enzyme test, alpha-galactosidase, is **unrelated**
to Alpha-gal Syndrome.



Tick-Borne
Conditions United

Chatham County Area Tick-Borne Illness Surveys

Gap b/w exposure and understanding

- Conducted July-September 2015 among residents (Chatlist, etc); 2017 at CCCC and Fearington
- Most respondents reported a tick bite personally or in household within the past year (>90%)
- Most common prevention: tick checks/repellents
- Most did not know which TBCs are in Chatham County





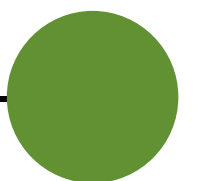






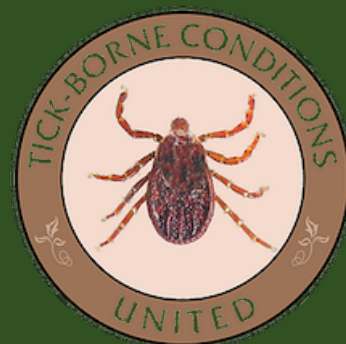
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