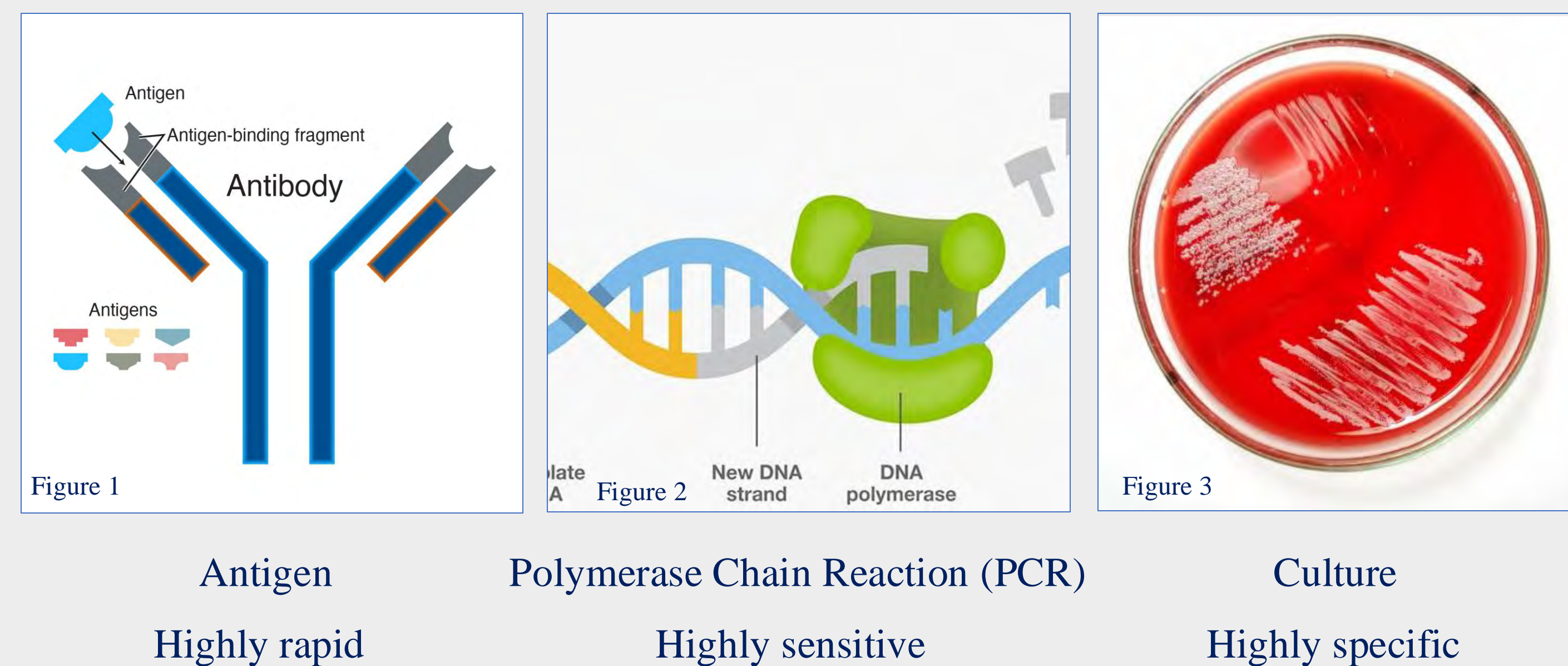# A Comparative Analysis of Campylobacter Testing and Antibiotic Practices in Acute and Chronic Gastrointestinal Cases

Hemanya Bhatt
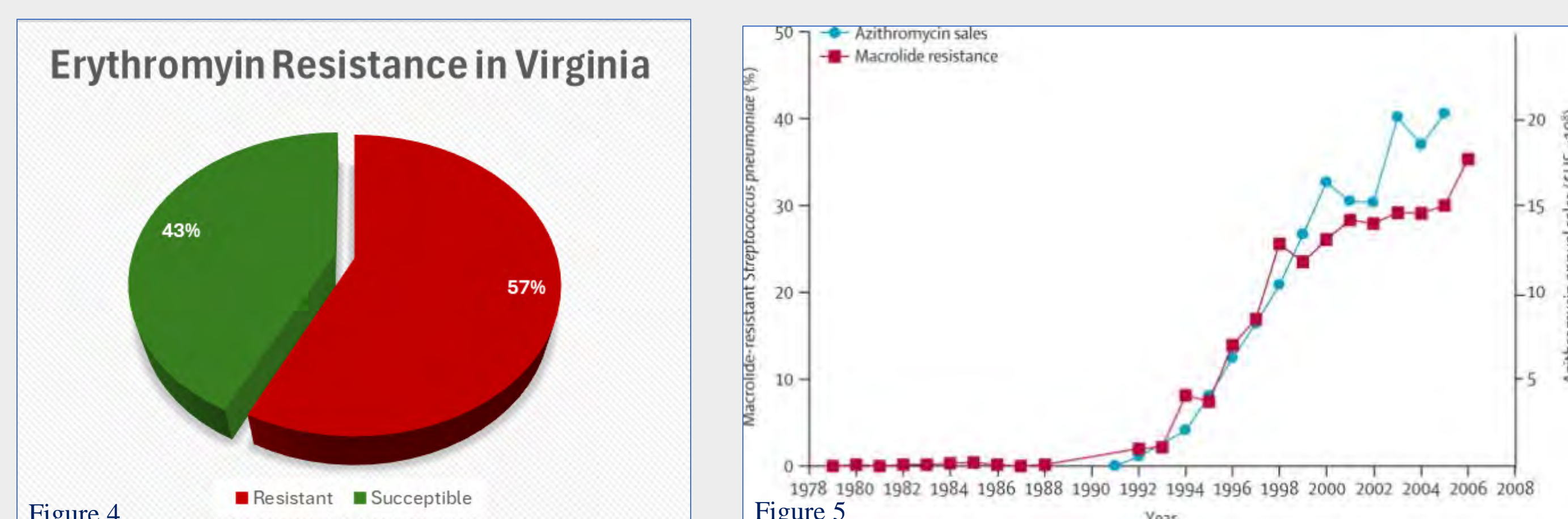Richmond & Henrico Health District
Cohort 3, 2025, Epidemiology

Background

- Campylobacteriosis is the leading bacterial cause of acute gastroenteritis globally caused by *Campylobacter jejuni* and *Campylobacter coli*
- Acquired by consuming contaminated food or water or through improper meat handling practices
- Symptoms may include diarrhea, nausea, vomiting, abdominal pain, and fever. In rare cases, a Campylobacter infection can lead to Guillain-Barré Syndrome
- Usually do not require antibiotics and resolve with oral rehydration therapy (drinking water and electrolytes)
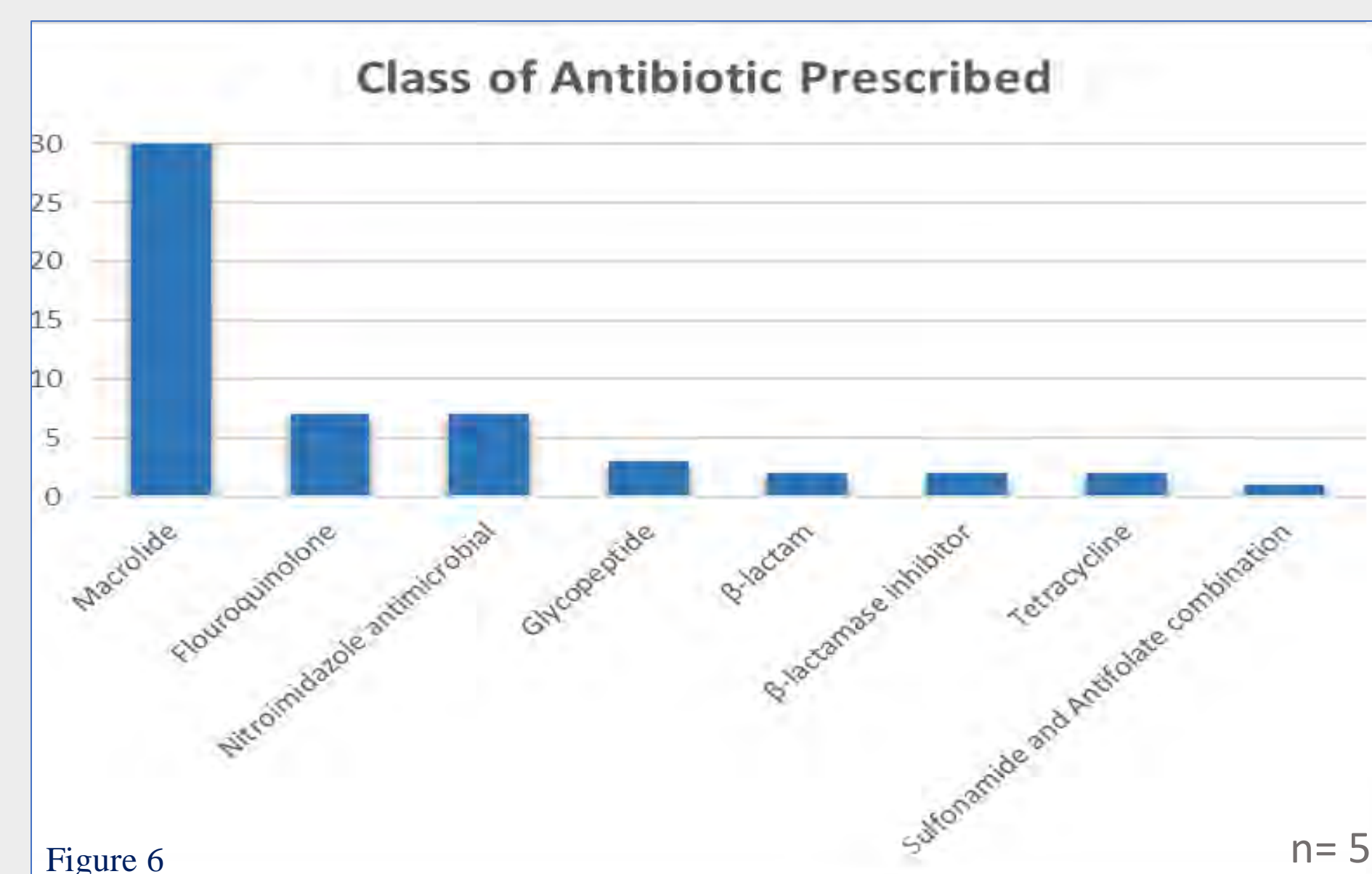
Diagnostic Tests

Figure 1 — Antigen — Highly rapid

Figure 2 — Polymerase Chain Reaction (PCR) — Highly sensitive

Figure 3 — Culture — Highly specific

Antibiotic Resistance

Figure 4 — Erythromyin Resistance in Virginia — 43% Succeptible, 57% Resistant

Figure 5

- Erythromycin resistance is predictive of azithromycin resistance
- Data was compiled using the VA State and Regional Cumulative Antibiogram of 2018
- Average of resistance rates from each disease was used
- Cross-resistance between erythromycin and azithromycin can limit treatment options for macrolide-resistant infections

- The rise in Macrolide resistance as azithromycin sales increased over time
- Mass use of macrolides in agriculture and animal husbandry has contributed to environmental reservoirs of resistant bacteria
- Resistance can happen through overuse, misuse, spontaneous mutations, or transmitted resistance
- Overuse and misuse are the easiest to address

## Data Collection and Analysis

- Data from Virginia Electronic Disease Surveillance System (VEDSS) and paper case report forms from 2024 were compiled into a spreadsheet. Trends are shown below:
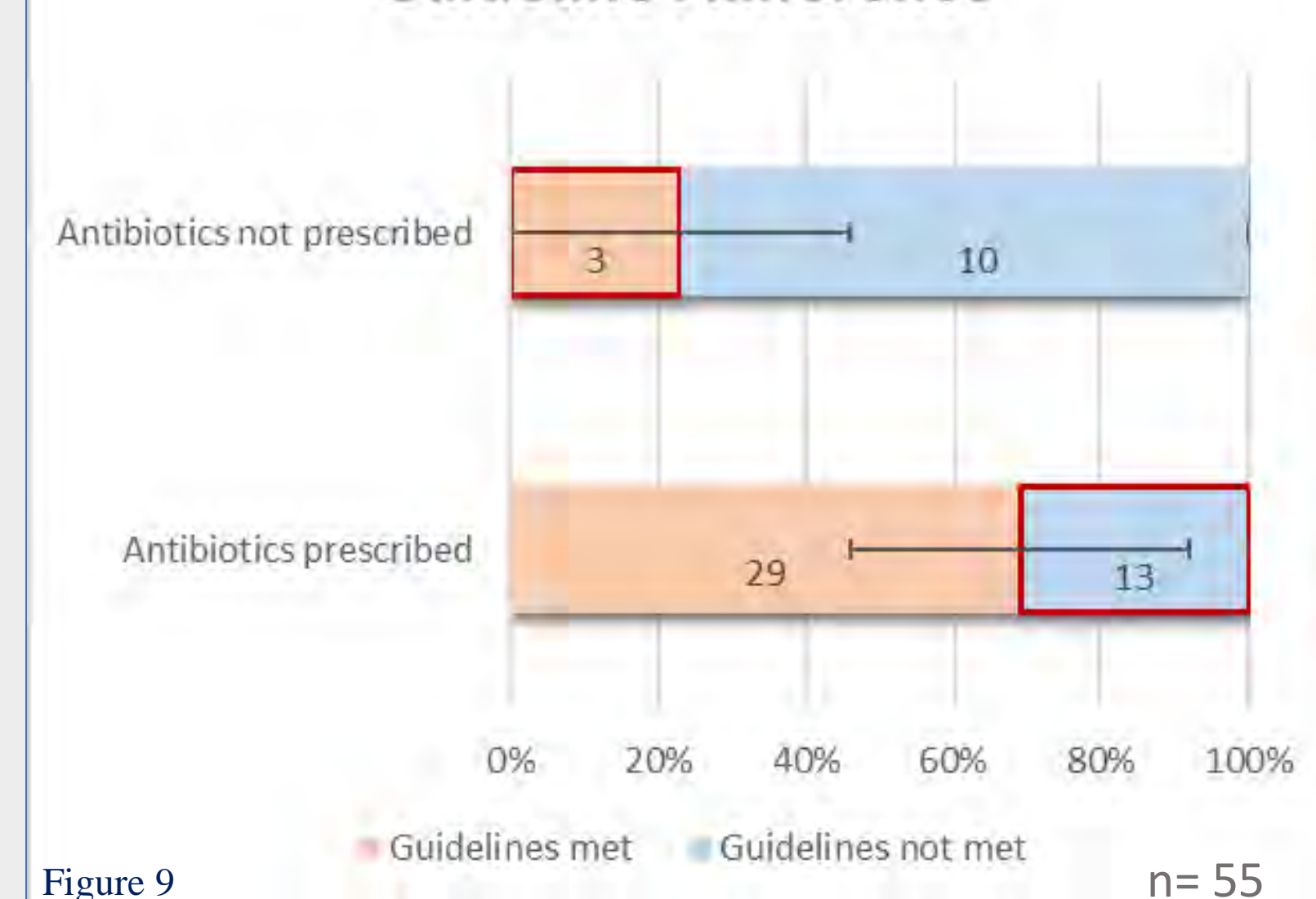

Figure 6 — Class of Antibiotic Prescribed — n= 55

Figure 7 — Antibiotic Prescription Rates in Acute and Chronic Campylobacter Cases — n= 59
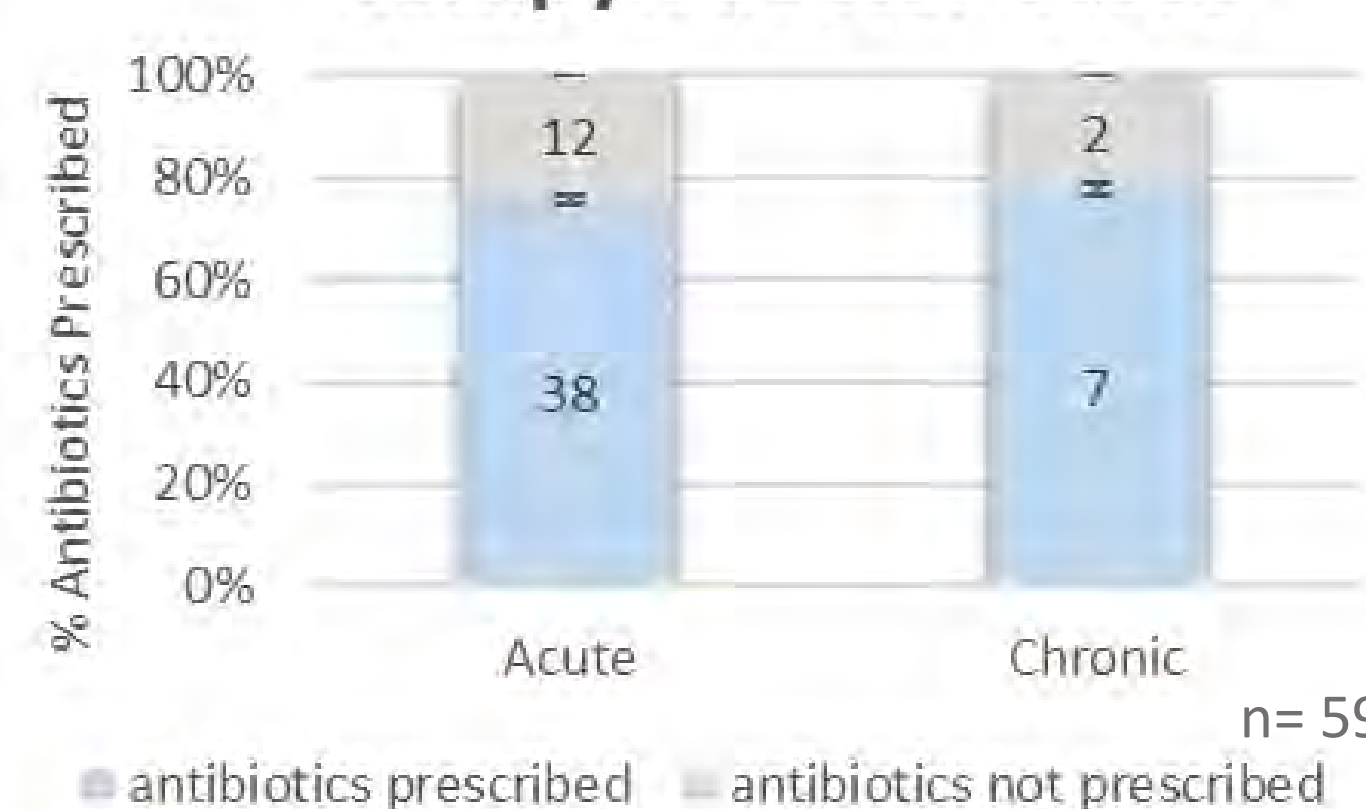
Figure 8 — Choice of Diagnostic Test in Acute and Chronic Campylobacter Cases — n= 59
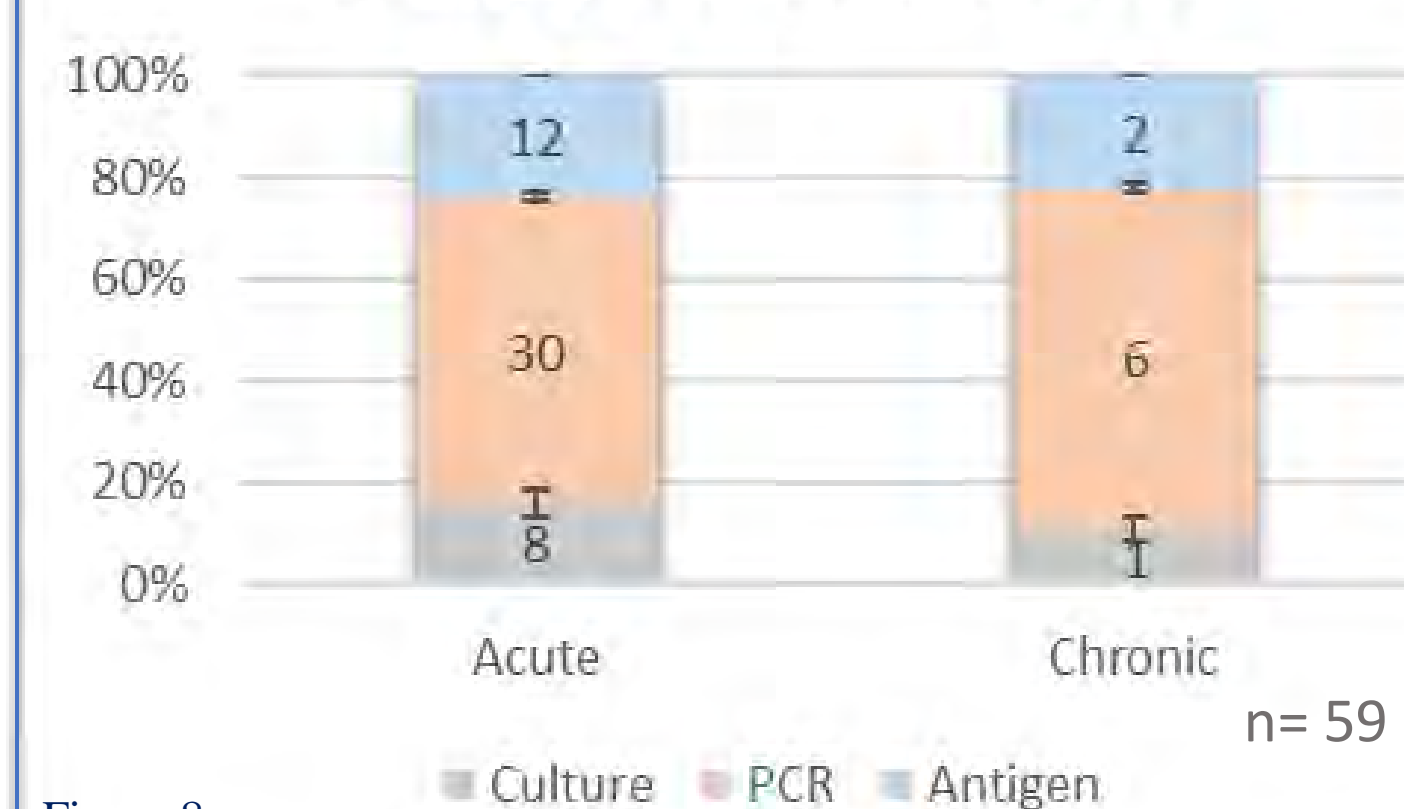
Figure 9 — Antibiotic Prescription vs Guideline Adherence — n= 55

- **In summary:**
  - The most common type of antibiotic prescribed were **macrolides**, which **VA is building resistance against** (Fig. 4)
  - **Chronicity does not seem to play a role** in whether **antibiotics** are prescribed, or which **diagnostic method** is used
  - Around **22%** of cases had **antibiotics not prescribed** when they **met the guidelines** for prescription
  - Around **30%** of cases had **antibiotics prescribed** when they **did not meet the guidelines** for prescription

Antibiotics may have been prescribed for other conditions
Threshold for chronicity was 3 months

Clinical Application

- Most common **enteric diseases** (campylobacter, salmonella, yersinia, etc.) **resolve without antibiotics**, so doctors should be cautious about prescribing them, especially when guidelines are not met
- **Avoid** using **antibiotics** to treat **colonization or contamination**
- When diagnosing a **chronic infection**, steer away from less sensitive tests such as antigen tests
- Consider **stool cultures** and sensitivity testing before initiating antibiotics whenever possible
- If antibiotics are truly needed, **educate patients** on misuse and overuse
- Use the **narrowest spectrum** antibiotic for the patient's condition
  - General antibiotics are often prescribed and later changed

Follow the ABCs of antibiotics!

Ask yourself — Were these antibiotics needed?
Bacteria — Get a culture to confirm a bacteria is causing the illness, not a virus
Conserve — Prescribe for shortest duration possible
Don't give in — Don't let patients pressure you into prescribing antibiotics
Educate — Tell your patients WHY antibiotics are not needed for:
- cold, flus, and most coughs
- bronchitis
- sore throats not caused by strep
- most ear aches

Figure 10

Other Responsibilities

- Conducting **disease investigations** for enteric disease cases reported in the Henrico County Health District
- Assisting in a **point prevalence survey** for long-term acute care facility and testing patients for *Candida auris*
- Attending **advanced genetic epidemiology training** to gain insight on how genomics plays a role in disease surveillance and investigation
- Creating a **disease investigation guide** for incoming interns

Acknowledgements