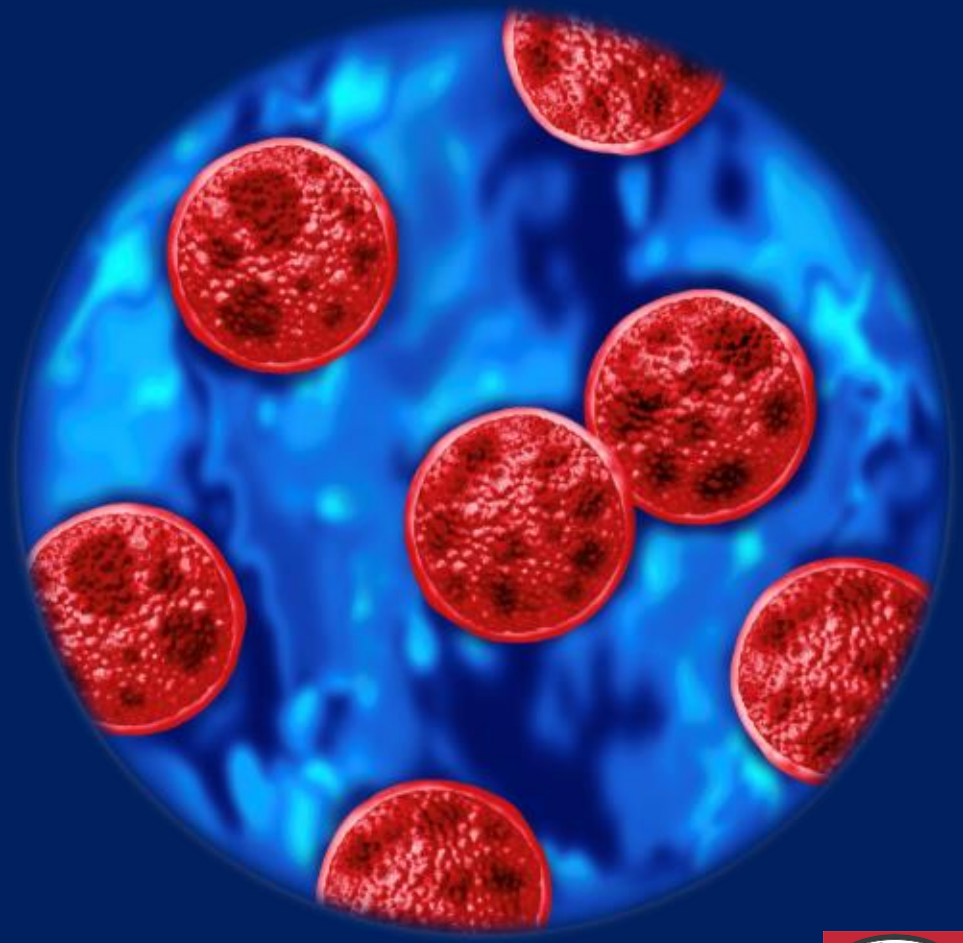
UWTASP
tele-antimicrobial stewardship program

Cyclospora
Stewardship Opportunities & Beyond



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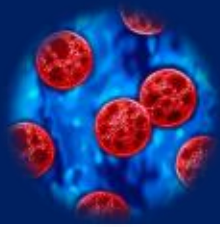
Project ECHO

Cyclospora: *Disclosures & Objectives*

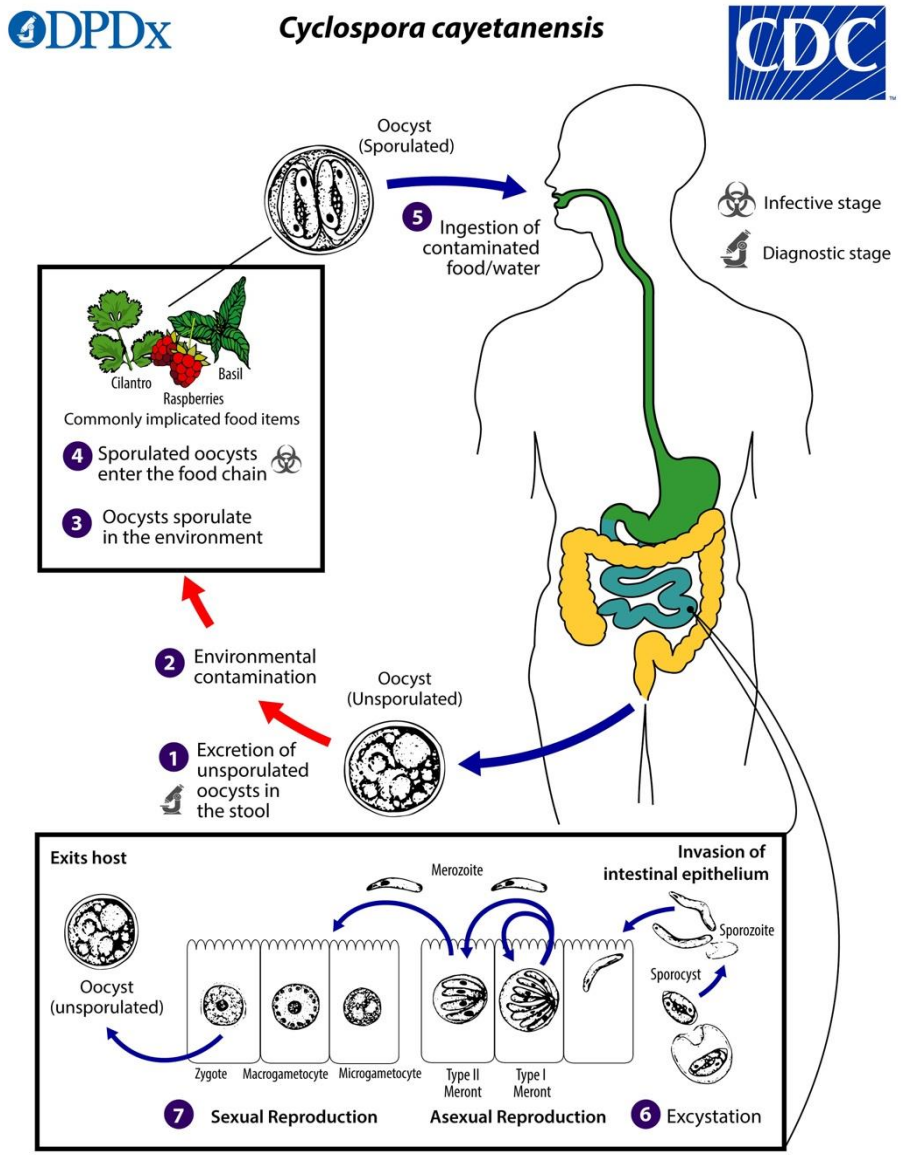


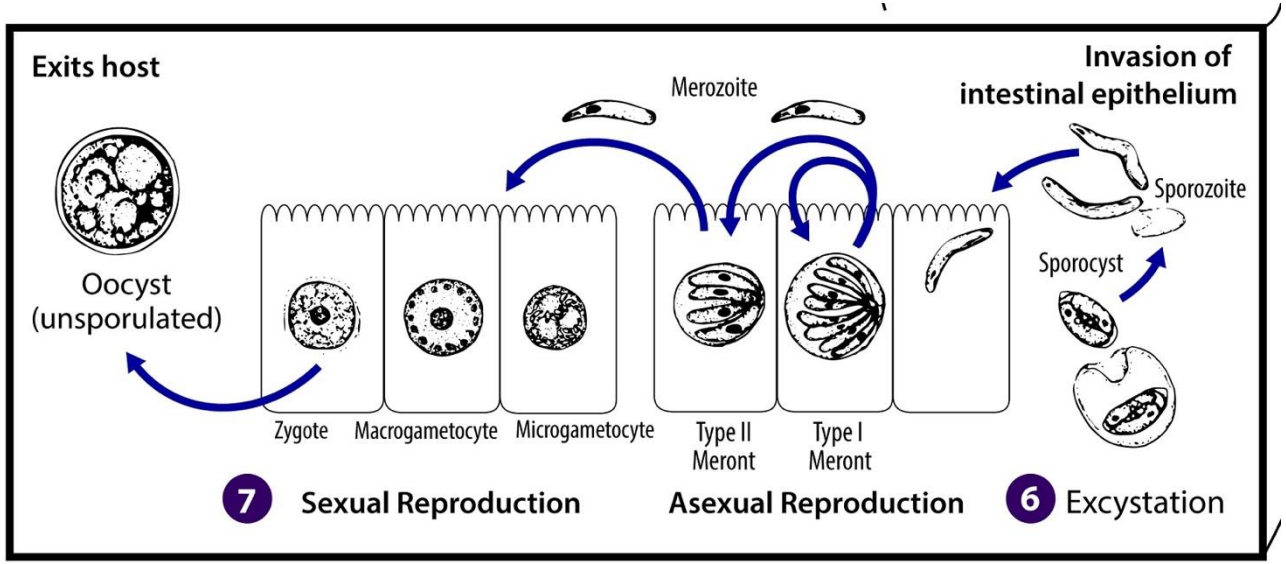
No conflicts of interest

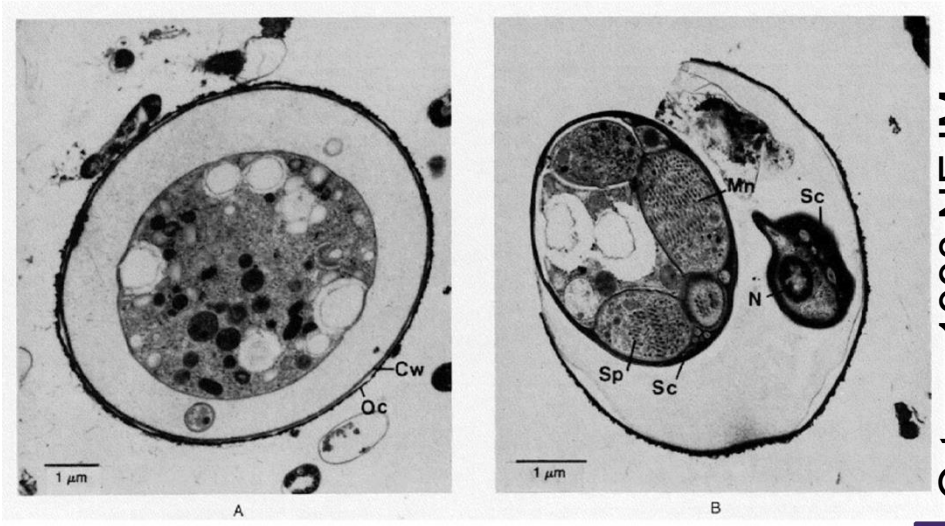
Cyclospora

- Micro: *Know the cause*
- Illness: *Recognize clinically*
- Diagnostics: *Confirm your suspicion*
- Epidemiology: *National update*
- Treatment: *Antiparasitic options*
- Stewardship Opportunities: *Local & beyond*

Cause: *Cyclospora cayetanensis*







Ortega 1993 NEJM

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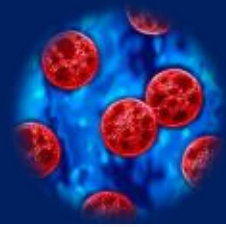
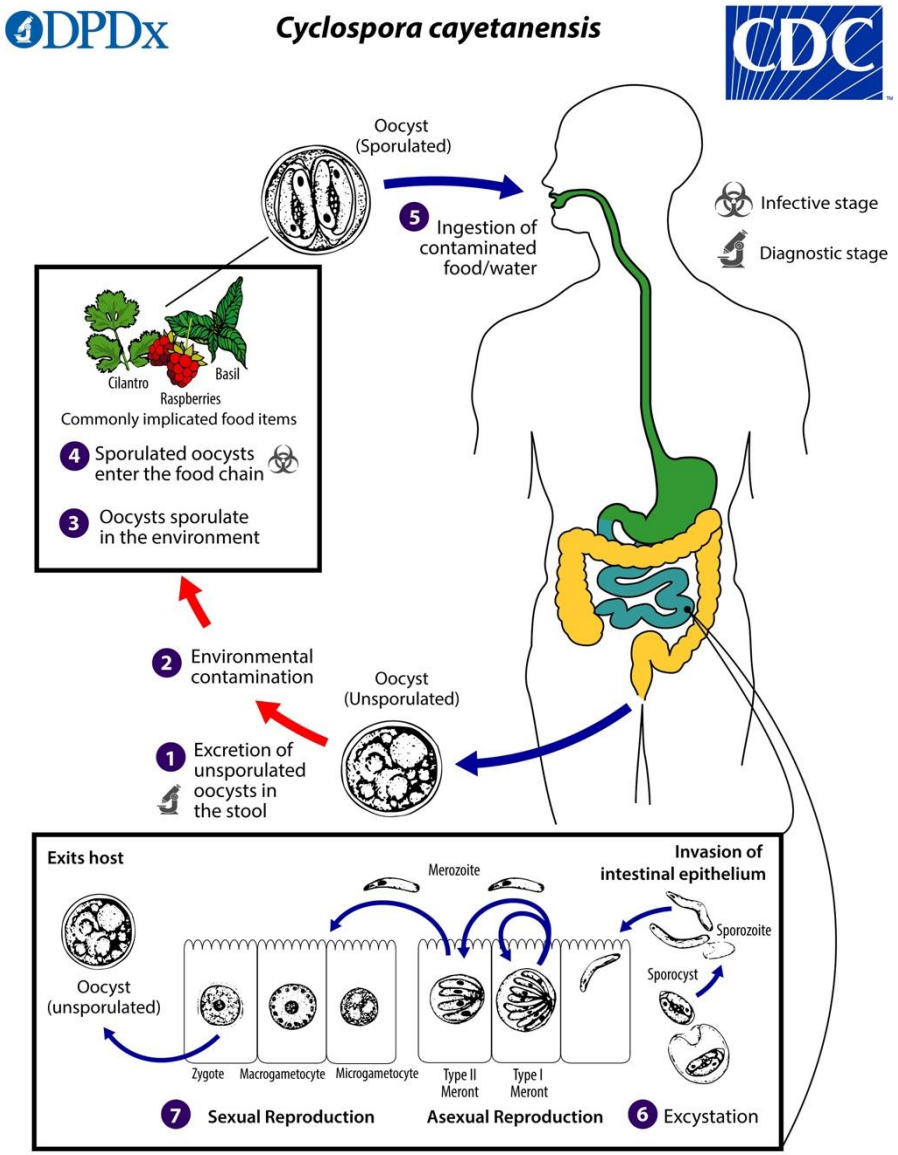
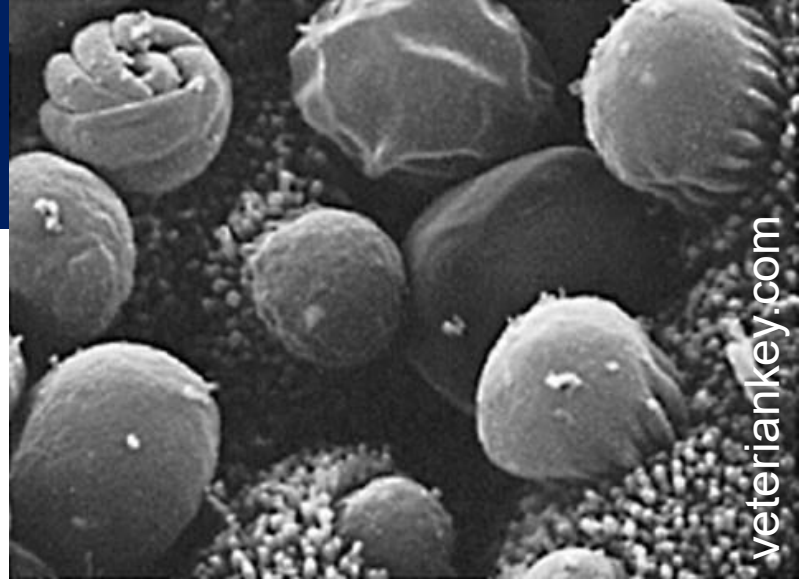
Cause: *Cyclospora cayetanensis*





- Protozoan parasite
- Humans only known hosts
- Complex life cycle…
  - ✓ NOT infectious when passed in stool… must sporulate in environment for days or weeks before becoming infectious
  - ✓ Fecal / Soil / Oral infection route
  - ✓ Invade small intestine lining
  - ✓ Diarrhea assists spread

Cyclospora: *Clinical Presentation*

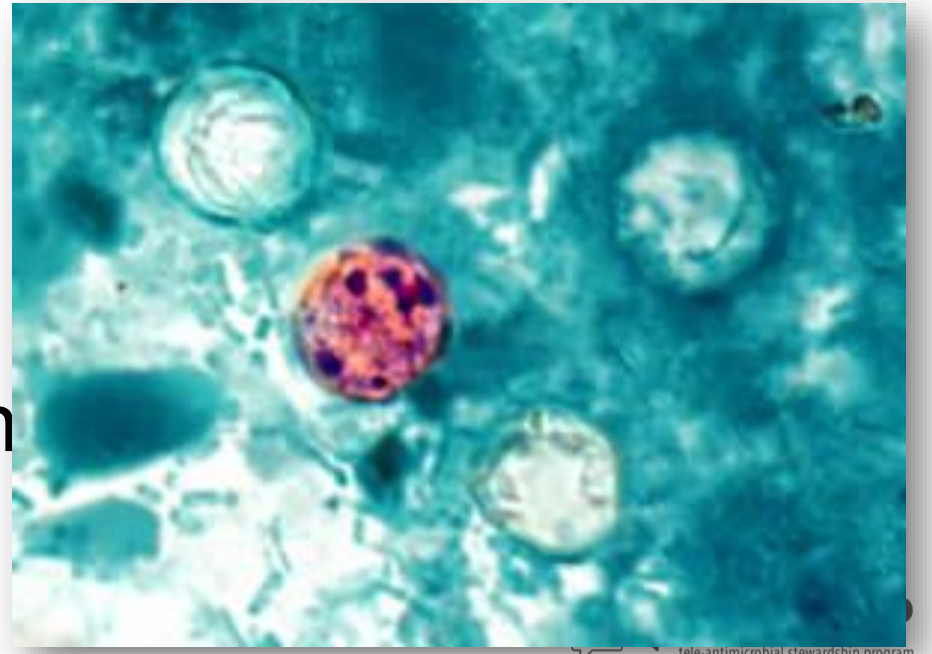


- Incubation: ~ 7 days
- Illness: Profuse watery diarrhea
- Can mimic giardiasis (malabsorption, odor, eructation)
- Dysentery (inflammatory bloody stool) NOT typical
- Severity & Course: Depend on host immunity
  - ✓ Normal: May be mild or bad, last 10-12 weeks
  - ✓ Suppressed (e.g. HIV): May be severe, malnutrition, chronic carriage & passage possible

Cyclospora: *Diagnostics*

Stool specimens (no blood testing)

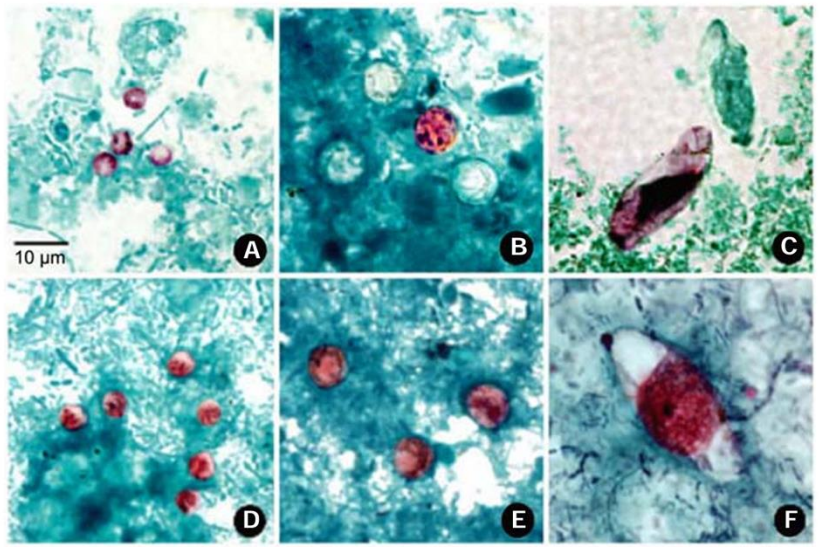
- Cary-Blair medium best… if unpreserved, examine ASAP and keep in fridge if delay
- Direct Wet Exam: Unpigmented, almost invisible
- Gram Stain: Not helpful
- Giemsa or Trichrome: Not helpful
- Modified AFB or Safranin:
  - ✓ NPV: Unreliable on single specimen
  - ✓ Repeat every 2-3 days x 3



Key points for laboratory identification of

Cyclospora, *Cryptosporidium*, and *Cystoisospora belli*

DPDx
Laboratory Identification of Parasites of Public Health Concern



Oocysts in stool smears stained with modified acid-fast stain:

A *Cryptosporidium* sp.
B *Cyclospora cayetanensis*
C *Cystoisospora belli*

Oocysts in stool smears stained with safranin stain:

D *Cryptosporidium* sp.
E *Cyclospora cayetanensis*
F *Cystoisospora belli*

Wet mount preparations

G *Cyclospora cayetanensis* sequence showing sporulation event from unsporulated oocyst (far left) to sporulated oocyst containing 2 sporocysts (far right) under differential interference contrast (DIC)

H *Cystoisospora belli* (UV fluorescence microscopy)

I *Cyclospora cayetanensis* (UV fluorescence microscopy)

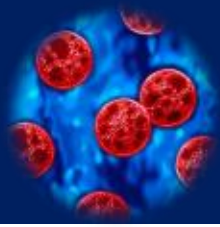
CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION
SAFER·HEALTHIER·PEOPLE™

Cyclospora: *Diagnostics*

Stool specimens (no blood testing)

- Molecular testing benefits
- Automated operation
- Simultaneously seek other pathogens
- “Very High” NPV on single specimen
  - ✓ BioFire: 100% Sensitive & Specific… based on just 19 known positives / > 1,500 negatives
- Repeat molecular testing rarely necessary

Cyclospora: *Epidemiology*



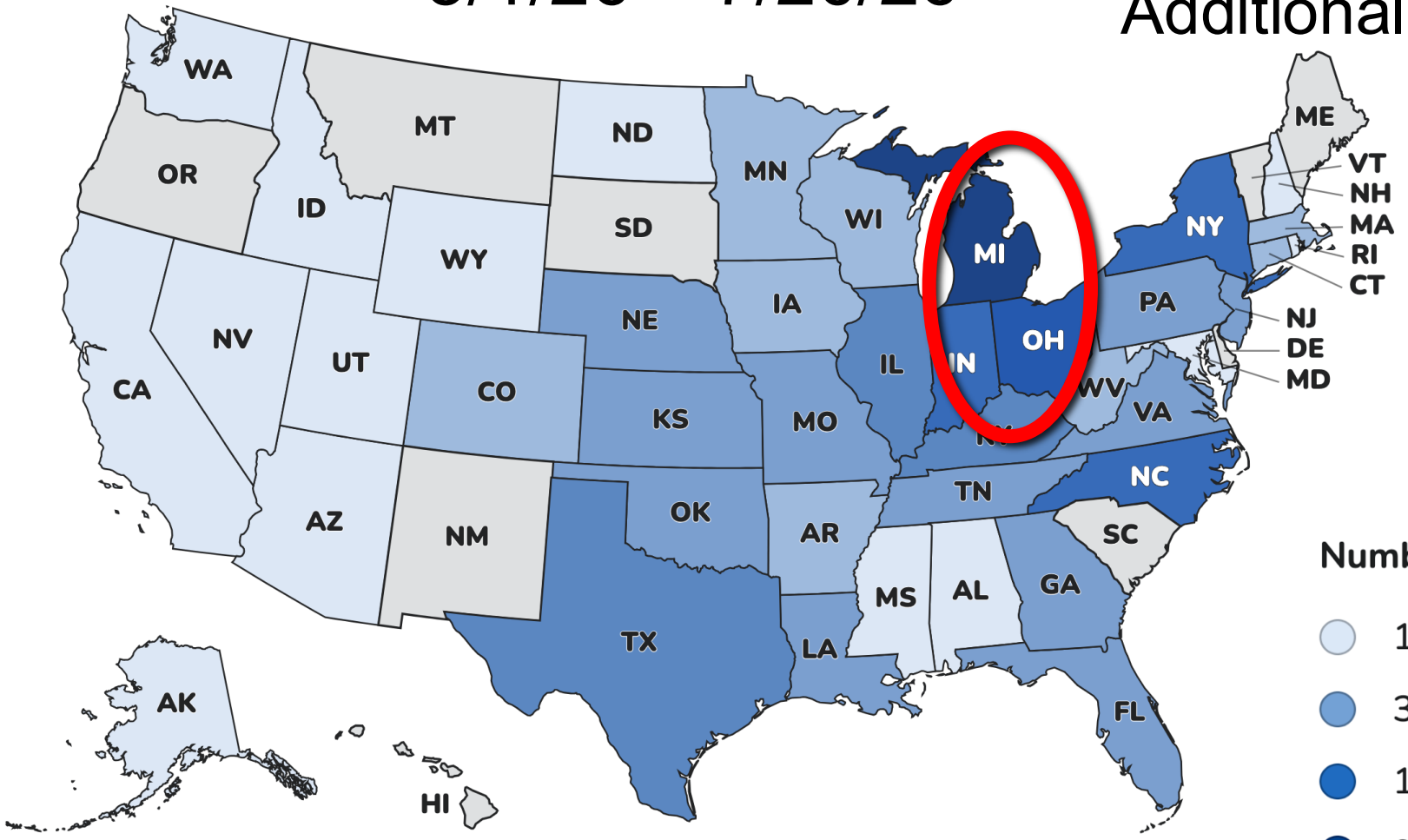
- Spring & summer predominance
- Often linked to imported produce (raspberries, cilantro, basil, lettuce)
- Annual case range: 500-2,000
- Recent peak year: 2019 (~4,700 cases)
- Mandatory reporting to CDC in 47 states (hello, Idaho?)
- Optional reporting via FoodNet Surveillance System as of 2025 (current focus: Salmonella & STEC).

https://www.cdc.gov/foodnet/about/index.html

Cyclospora: *US-Acquired* Cases 2026

5/1/26 – 7/20/26

Confirmed cases: 4173
Additional suspected cases: > 7400



States: 41
Ages: 2-95 years
Median Age: 44
Female: 56%
Deaths: 0

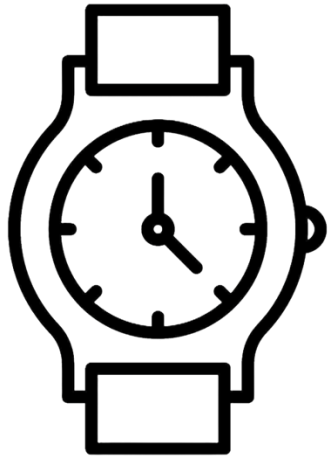
Number of Cases

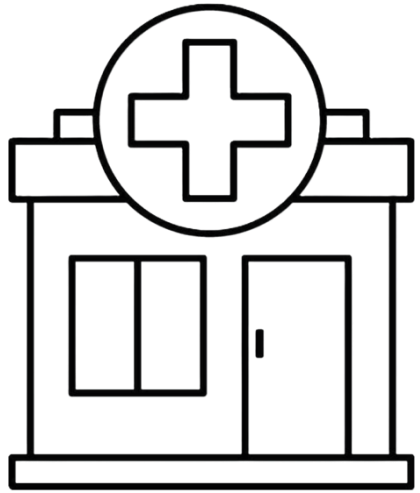
- 1 to 10
- 11 to 30
- 31 to 80
- 81 to 160
- 161 to 300
- 301 to 500
- 901 to 2100

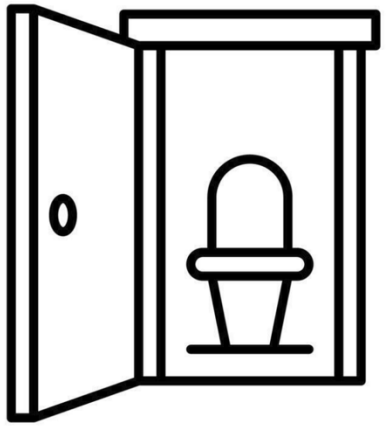
https://www.cdc.gov/cyclosporiasis/php/surveillance/index.html

Cyclospora: *US-Acquired* Cases 2026

Cyclospora: *Root Causes… and Solutions?*







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Cyclospora: *Treatment*

TMP/SMX 1 DS PO BID x 7 days

- DB-RCT: Stool eradication 94% (vs 12% placebo)
- Extend to 10 days +/- TIW prophy for immunocompromised

Cipro 500mg PO BID x 7 days

- DB-RCT: Inferior to TMP/SMX (Symptom improvement 87% vs 100%... stool clearance 70% vs 100%)

Nitazoxinide 500mg PO BID

- Poor evidence from parasite clearance study in Mexico

Hoge *Lancet* 1995; Verdier *Annals Int Med* 2000; Diaz *AJTMH* 2003

Cyclospora: *Treatment Summary*

Population	Regimen	Dose	Duration	Refs
Immunocompetent adults	TMP-SMX (first-line)	1 DS tablet (160/800 mg) BID	7 days	[1-3]
HIV/AIDS patients	TMP-SMX (first-line)	1 DS tablet QID	10 days, then 3×/week prophylaxis	[2, 4-5]
Solid organ transplant recipients	TMP-SMX (first-line)	1 DS tablet BID–QID	7–10 days + secondary prophylaxis	[6]
Sulfa-intolerant patients	Ciprofloxacin ($2^{nd\text{-}line}$)	500 mg BID	7 days, then 3×/week prophylaxis	[1, 5-6]
Sulfa- and cipro-intolerant	Nitazoxanide ($3^{rd\text{-}line}$)	500 mg BID	7 days (limited data)	[7]
Children (endemic areas)	TMP-SMX	5/25 mg/kg/day	3–7 days	[1, 8]

Cyclospora: *Stewardship Opportunities*

Diagnostic: Molecular vs Microscopy

- Upfront vs Ongoing costs
- Simplified training & QC
- Leverage for other pathogens (& specimens)
- When to test… or retest?

Cyclospora: *Stewardship Opportunities*

Treatment: TMP/SMX vs Alternative

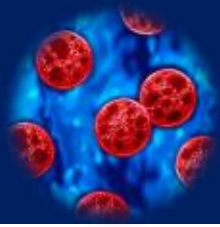
- Bactrim cheap, available, best evidence
- Cipro side effects & toxicities…
- Nitazoxanide pricey & not stocked
- TMP/SMX may have toxicities too
- “Sulfa allergy” a common concern
- High-burden regions: stock all 3 drugs?

Cyclospora: *Stewardship Opportunities*

Prevention: Safety vs Big Agriculture?

- Public Health investments always pay major dividends in long run
- Caring for agricultural workers is smart for many reasons
- Growing our food and taking our money should be a privilege for corporations

Cyclospora: *Disclosures & Objectives*



- **Micro:** *Protozoan parasite, human –soil – oral*
- **Illness:** *Watery diarrhea, ~ 7 days after infection, may last weeks without therapy*
- **Diagnostics:** *Microscopy on multiple stools or multiplex molecular usually 1 specimen*
- **Epidemiology:** *MUCH higher domestic case load vs baseline, many (not all!) linked to lettuce*
- **Treatment:** *TMP/SMX top option*
- **Stewardship Opportunities:** *Let's discuss*

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