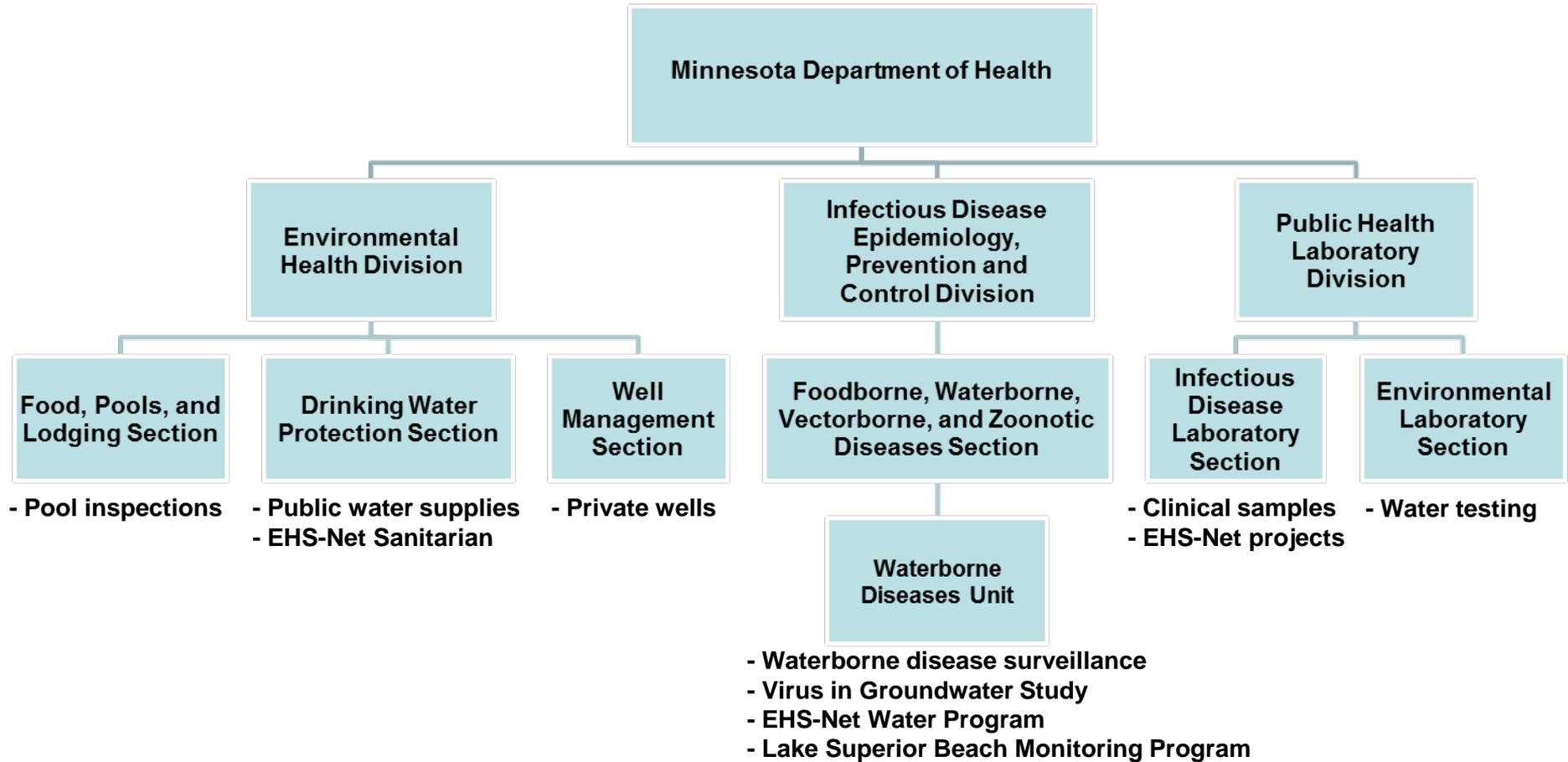




**WATERBORNE ILLNESS:
SURVEILLANCE
AND
OUTBREAK DETECTION
IN MINNESOTA**

**Trisha Robinson, MPH
Supervisor,
Waterborne Diseases Unit
Minnesota Department of Health**

Organizational Structure of Water Safety in Minnesota





ORVILLE L. FREEMAN
STATE OFFICE BUILDING
ROBERT STREET NORTH

ORVILLE L. FREEMAN OFFICE BUILDING

615

Primary Waterborne Disease Outbreak Detection Mechanisms in Minnesota

- **Reportable diseases**
 - **Individual reported cases are interviewed, exposures compared to other reported cases**
- **Notification by health care professional or patient of multiple illnesses from common event**
 - **e.g., camp, family reunion, birthday party**
- **Multiple individual complaints about same pool, beach, or drinking water system**

WATERBORNE DISEASES

Campylobacteriosis (*Campylobacter* sp.)*

Cholera (*Vibrio cholerae*)*

Cryptosporidiosis (*Cryptosporidium* sp.)*

Enteric *Escherichia coli* infection (*E. coli* O157:H7 and other pathogenic *E. coli* from gastrointestinal infections)*

Giardiasis (*Giardia lamblia*)

Hemolytic uremic syndrome

Salmonellosis, including typhoid (*Salmonella* sp.)*

Shigellosis (*Shigella* sp.)*

***Submit isolates or clinical materials to the Minnesota Department of Health**

Reportable Bacterial Enteric Pathogen and *Cryptosporidium* Surveillance in Minnesota

- **Clinical materials must be submitted to the Minnesota Department of Health**
- **Real-time PFGE or PCR subtyping on all specimens**
- **Routine, real-time interviews of all cases**

Minnesota Surveillance Philosophy

- Interview all cases, ASAP
- Collect details on specific exposures
 - Dates
 - Names of restaurants, pools, resorts
 - Addresses
- Investigation of all PFGE and Crypto clusters
 - Intensity/resource expenditure depends on the nature of the cluster
 - Follow leads aggressively

Symptom and Exposure Questions

- Drinking water

- Raw milk

- Travel

- Gatherings

- Animal contact

- Daycare

- Ill contacts

- Recreational water

Date: / / Interviewer: _____ Tennessee

CRYPTOSPORIDIOSIS DISEASE WORKSHEET

Patient's Name (last, first): _____ DOB: / /

Parent's Name (if child): _____

SYMPTOM HISTORY:			
Nausea	Y N	Fever	Y N
Vomiting	Y N	Temp	_____
Diarrhea	Y N	Chills	Y N
Stools/24 hours	_____	Headache	Y N
Bloody	Y N	Loss of appetite	Y N
Duration (days)	_____	Weight loss	Y N
Cramps	Y N	Pounds lost	_____
Other:	_____		

Do you have any medical conditions that may suppress your immune system (e.g., diabetes, renal failure, Crohn's disease, cancer, HIV infection or lupus)? Y N Unk List: _____

Do you take any medication that may suppress your immune system (e.g., corticosteroids or cancer chemotherapy)? Y N Unk List: _____

Were you taking antacids in the 2 weeks prior to your illness? Y N Unk
If yes, what? _____

Were you on any other medications in the 2 weeks prior to your illness? Y N Unk
If yes, what? _____

Were you treated with antibiotics/antiparasitics after the onset of this illness? Y N Unk
If yes, what medication? _____
What date did you start taking your medications? / /
What date did you finish taking your medications? / /

The following questions refer to the 2 weeks before the onset of symptoms:

1. Did you drink water from any of the following sources? Y N Unk

Municipal or city water (directly from tap) Y N Unk

Well water Y N Unk

- Where? (eg. home, cabin) _____
- Address of well _____
- Describe well (eg. single home, multiple home) _____

Bottled Water Brand: _____ Y N Unk

Other (such as from a stream while camping) Y N Unk

- Specify _____

2. Did you drink any unpasteurized/raw milk? Y N Unk
—If yes, where consumed: _____ When? / /
—If yes, where purchased: _____

3. Did you drink any unpasteurized apple cider? Y N Unk
—If yes, where consumed: _____
—If yes, where purchased: _____

4. Did you go swimming in the 2 weeks prior to your illness? Y N Unk
—If yes, when and where (name and location): _____
 Fresh Water (lake, river, stream) / /
 Ocean / /
 Swimming pool / /
 Wading pool / /
 Splash pad / /

5. Have you gone swimming since your symptoms started? Y N Unk
—If yes, when and where (name and location): _____
 Fresh Water (lake, river, stream) / /
 Swimming pool / /
 Wading pool / /
 Splash pad / /

6. Did you consume meat from any place other than the grocery store (butcher shop, hunting)? Y N Unk
Source: _____

7. Did you garden? Y N Unk
—If yes, did you apply animal manure or compost to your garden? Y N Unk
 Compost When? / /
 Manure When? / / Type of manure (cow, sheep, etc.) _____

8. Did you have contact with household pets, either in your home or elsewhere? Y N Unk
Pets and description of contact: _____

9. During the 2 weeks prior to your illness, did you live on, work on, or visit a farm? Y N Unk
—If yes, name, location, and dates at farm (other than home farm): _____
 Live on farm _____
 Work on farm: _____ When? _____
 Visit farm: _____ When? _____

10. Did you visit a petting zoo, educational exhibit, fair, or other venue with animals? Y N Unk
—If yes, name/location: _____ When? _____

11. If yes to questions 9 or 10: Were any of the following animals present? If yes, did you have any contact with them?

	Home		Work		Other Farm		Petting Zoo/Exhibit	
	Present	Describe Contact						
Cow	<input type="checkbox"/>							
Goat	<input type="checkbox"/>							
Sheep	<input type="checkbox"/>							
Pig	<input type="checkbox"/>							
Other:	<input type="checkbox"/>							

12. Did you travel anywhere during the 2 weeks prior to your illness? Y N Unk
—If yes, where? _____
—If yes, what dates did you travel? Start Date / / End Date / /

13. Did you attend any large gatherings (weddings, showers, parties, festivals, fairs, etc.)? Y N Unk
—If yes, what type of event? _____
—Where? _____ When? / /

14. Do you know of anyone else with a diarrheal illness prior to or following your illness? Y N Unk
Who? _____ When? _____

Student Workers



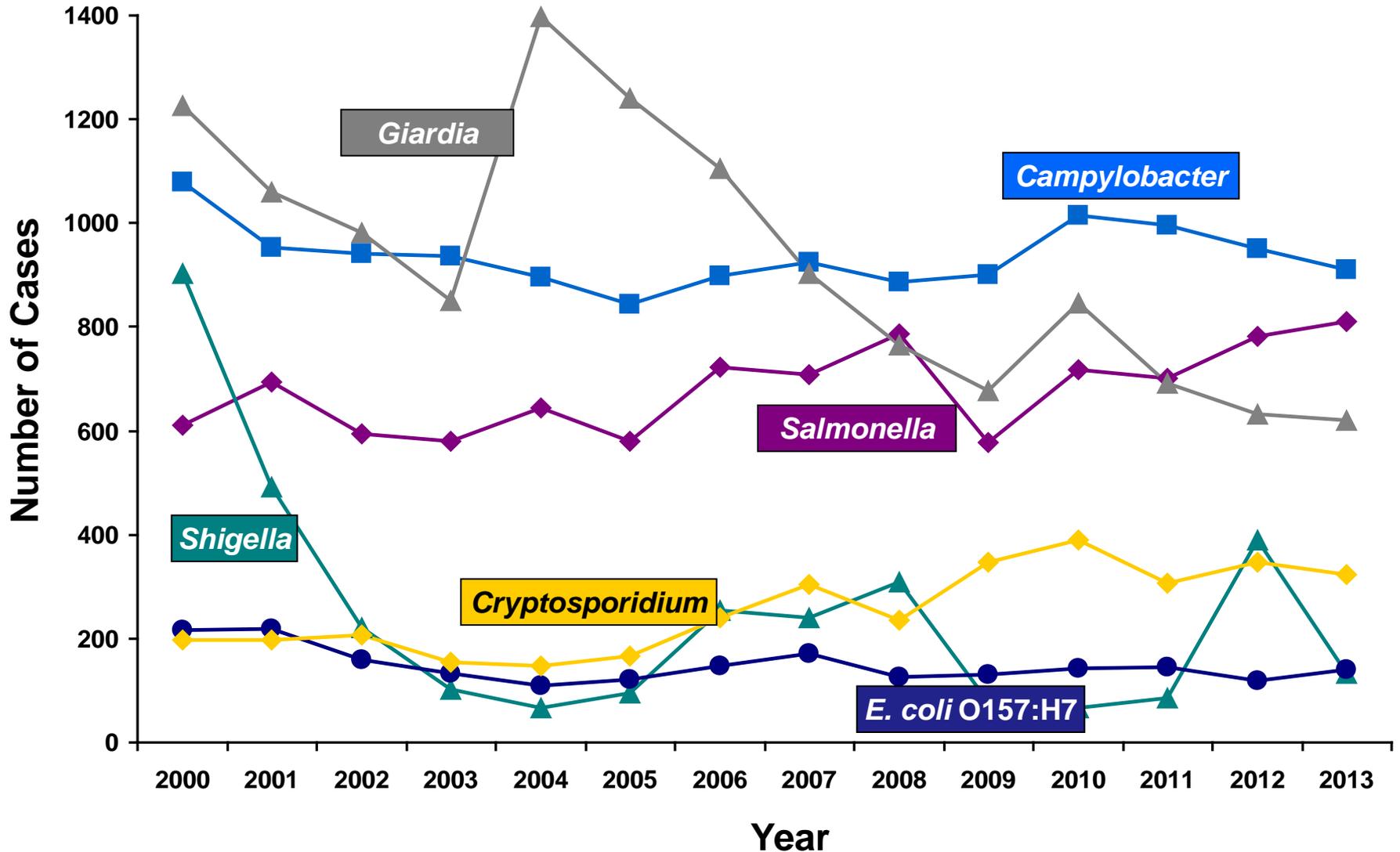
Water Students



Team Diarrhea

- **MPH students from U of MN SPH**
- **Hired as temporary MDH employees**
- **~20 hours/week**
- **Intensive training, oversight by MDH epidemiologists**
- **Person-power to rapidly interview all cases; do calls for cluster investigations**

Selected Enteric Pathogens Reported to MDH, 2000-2013



Minnesota Foodborne & Waterborne Hotline

Call to report
foodborne &
waterborne illness

Toll free statewide:

1-877-366-3455

1-877-FOOD ILL



625 N Robert St.
St. Paul, MN 55155
www.health.state.mn.us

- Centralized at State Health Department
- Coordinated by one person
- Complaints received from public directly or from public via local health departments

Assessing Waterborne Illness Complaints

- **Number ill**
- **Other common exposures?**
- **Incubation period and specific symptoms – do they fit together?**
- **Also get complete food history – complainant may not be targeting correct exposure**
- **Enter complaints into a database, and then continuously compare to identify independent complaints about same establishment**

Other Waterborne Disease Outbreak Detection Mechanisms in Minnesota

- Notification of water events
 - Boil water notices
 - Low pressure events
- Media

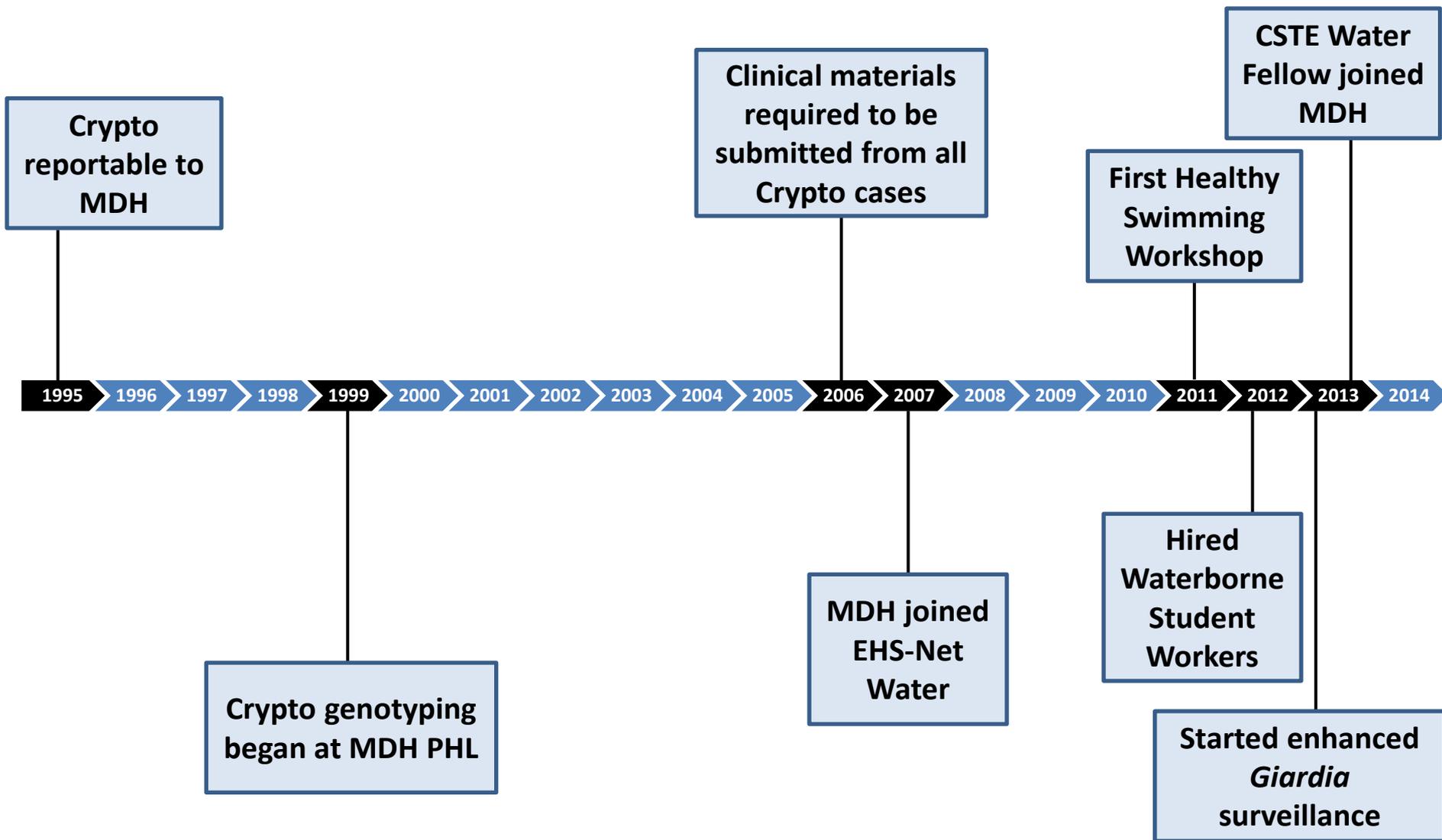
Pool @HolidayInn Owatonna closed today after families say they became sick, cough, vomiting. No response from hotel.

pic.twitter.com/svDZ49GweX

↩ Reply ↻ Retweet ★ Favorite ⋮ More



Highlights of Waterborne Disease Surveillance Improvements in Minnesota, 1995-2014



The Final Step...Reporting

CDC Home



Centers for Disease Control and Prevention
Your Online Source for Credible Health Information



Log In

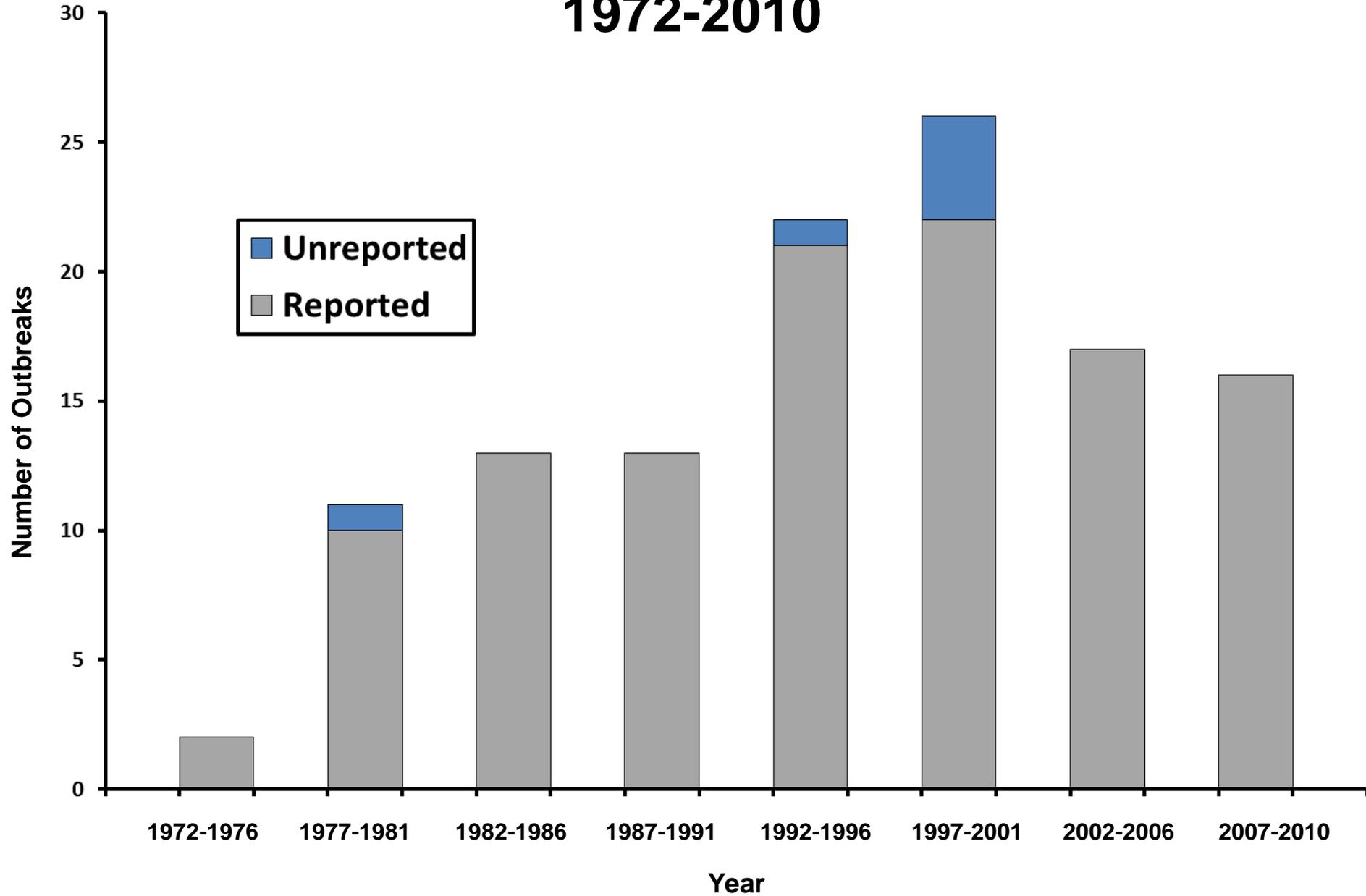
Username:

Password:

Log In

Help: [I am having problems logging in or I forgot my password](#)

Waterborne Outbreaks by Reporting Status, 1972-2010



Questions?

Stone Soup

Tom Swick



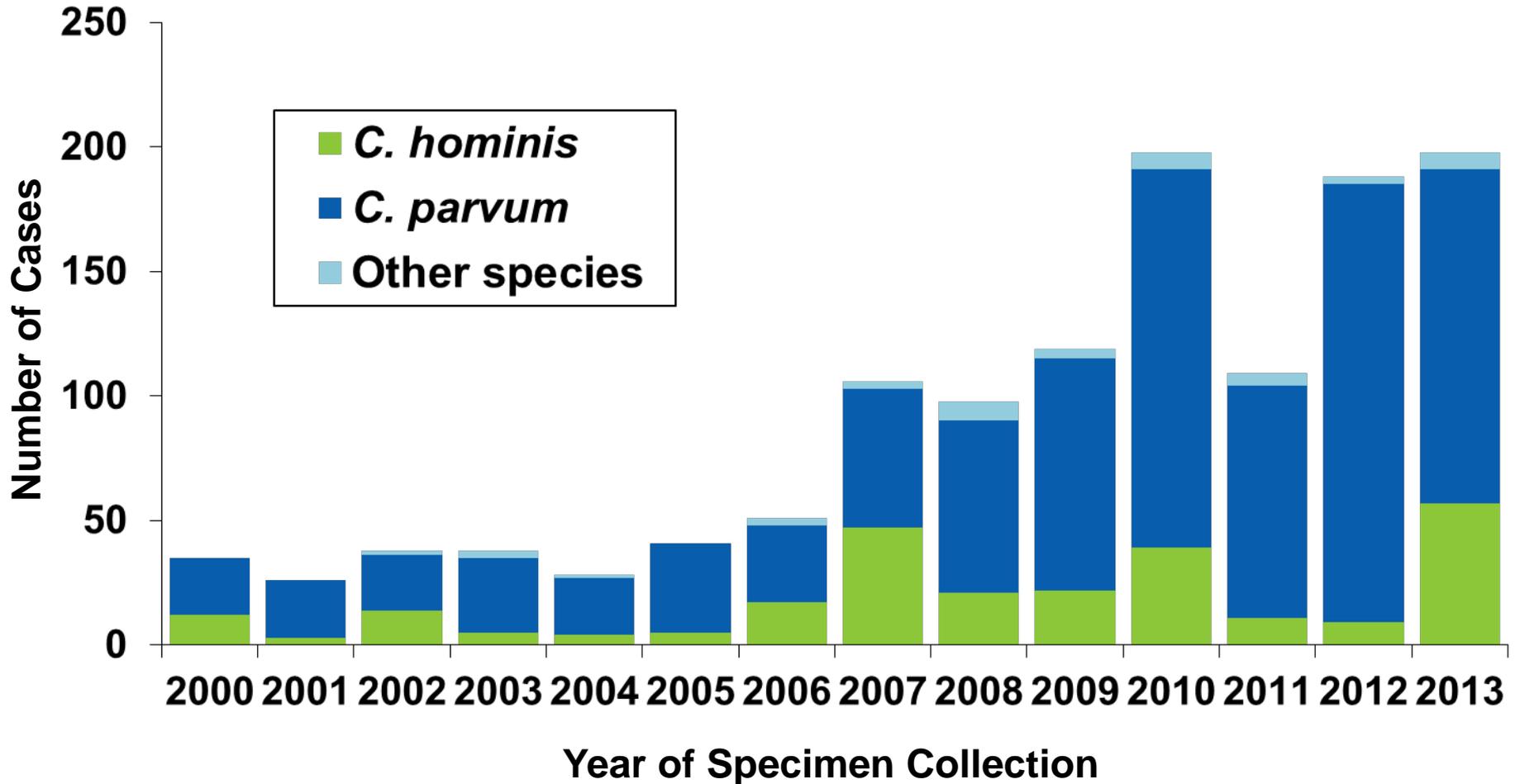
STONE SOUP © 2014 JAN BLITZ / GET UNIVERSAL UCLUBK

6-8

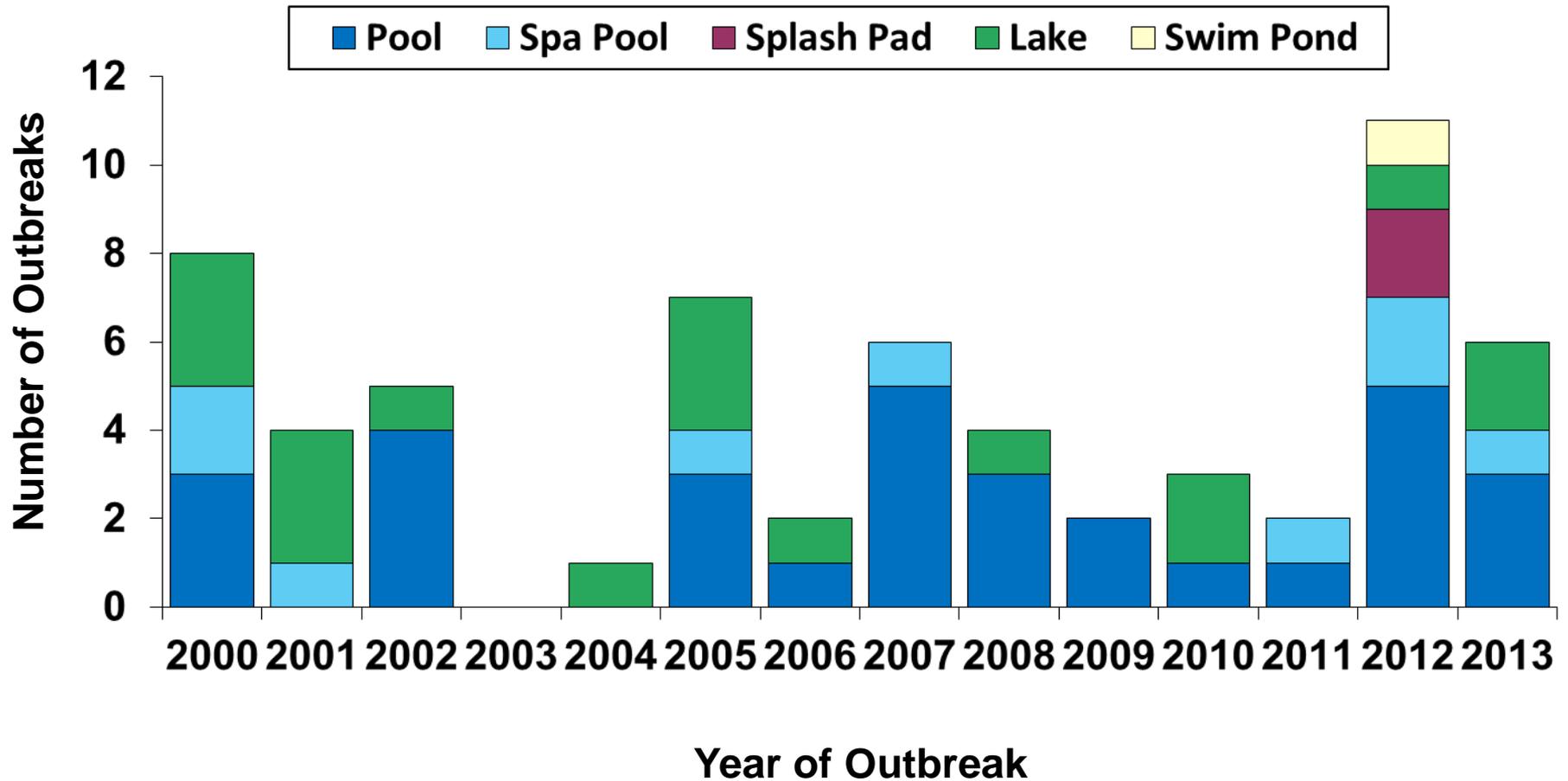
WWW.STONESOUPCARTOONS.COM / @COMICS.DOV

Tom Swick

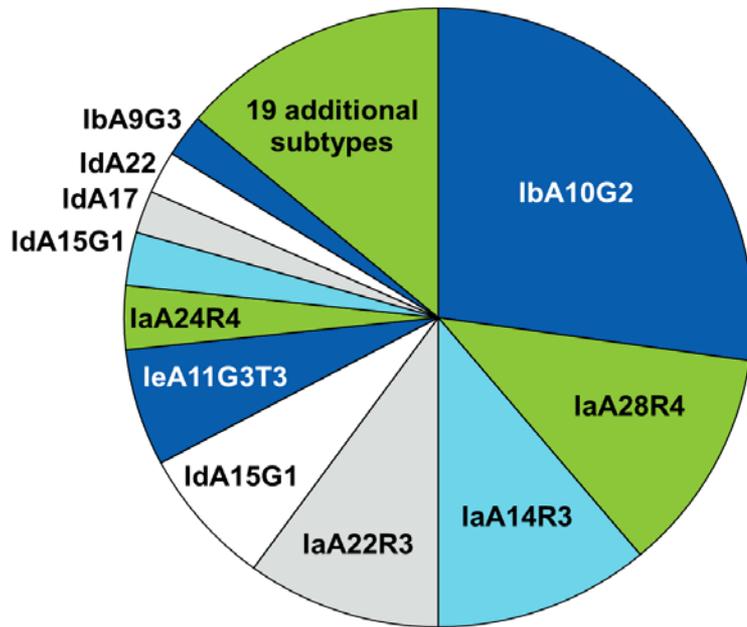
Number of *Cryptosporidium* Cases in Minnesota by Year and Species, 2000-2013



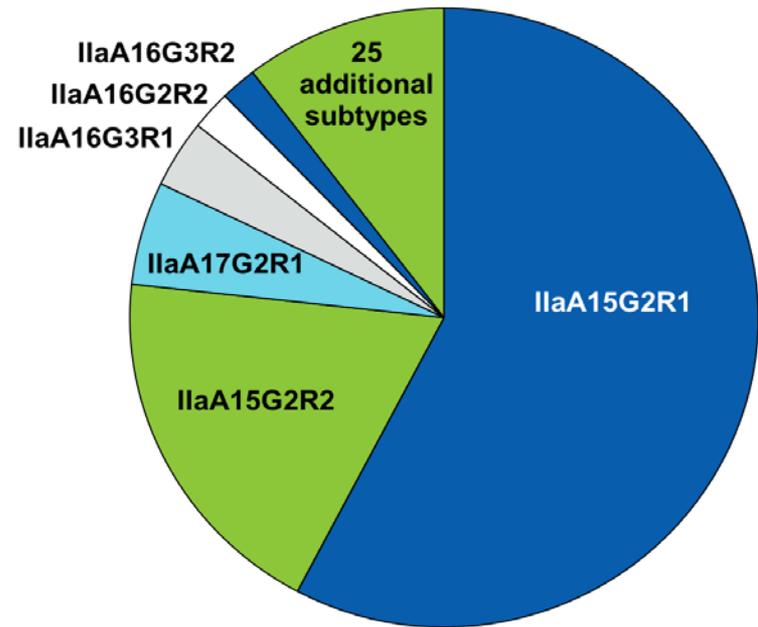
Recreational Water Outbreaks in Minnesota, by Venue, 2000-2013



***Cryptosporidium hominis* and *C. parvum* Subtypes, Minnesota, 2000-2010**



***C. hominis* Subtypes (n=30)**



***C. parvum* Subtypes (n=31)**