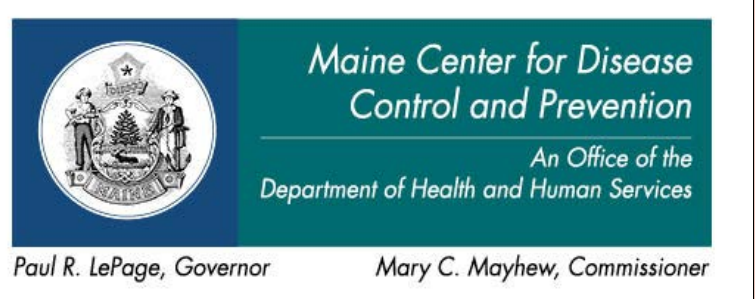


Culture-Independent Diagnostic Testing for *Campylobacter* spp. and *Cryptosporidium* spp. — Maine, 2012

Ralph Cammack, Amy Robbins MPH, Rick Danforth SM (ASCP), Lauren B. Ball DO, MPH, Susan Manning MD, MPH

Maine Center for Disease Control and Prevention



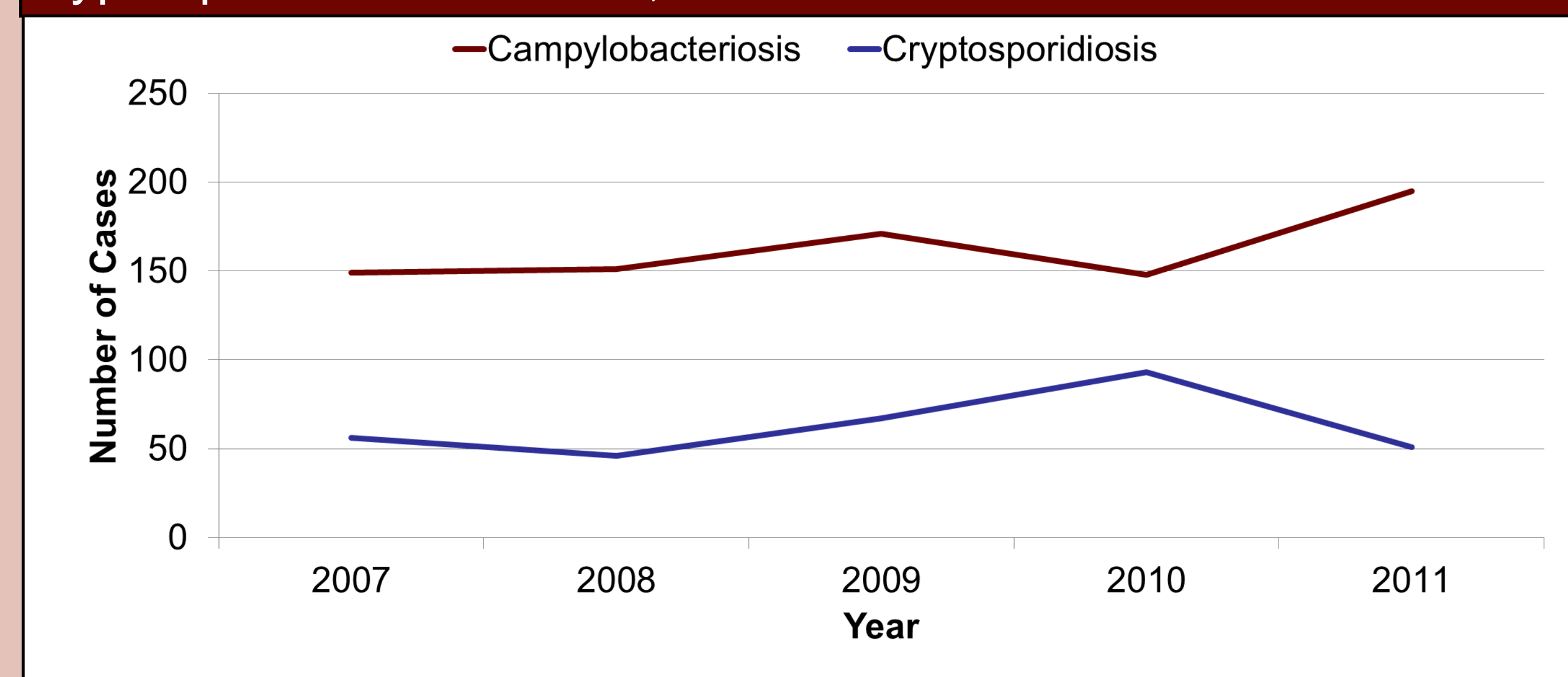
BACKGROUND

- Culture has long been the “gold standard” for diagnostic testing of bacterial enteric pathogens, including *Campylobacter* spp.
- Microscopy has been considered the “gold standard” for diagnostic testing of *Cryptosporidium* spp.
- Culture-independent methods including rapid methods and enzyme immunoassays (EIA) have emerged as commonly used diagnostic tests
- Public health officials use notifiable disease reports to estimate the burden of illness and monitor trends in disease incidence
- Culture-independent methods, which are known to have low specificities and potential for false positives, can result in an overestimation of the burden of disease
- Culture-independent tests (Figure 1) do not yield an isolate, which is needed for speciation, molecular subtyping, and susceptibility testing to monitor antibiotic resistance
- Campylobacteriosis and cryptosporidiosis is reportable in Maine (Table 1). Surveillance case definition for Cryptosporidiosis changed in 2009, 2011 and 2012

Figure 1. Example of a culture-independent test



Table 1. Number of cases of campylobacteriosis and cryptosporidiosis in Maine, 2007-2011



OBJECTIVE

The objective of this study was to gain a better understanding of the types of diagnostic tests being utilized in Maine clinical laboratories for the diagnosis of *Campylobacteriosis* and *Cryptosporidiosis* and evaluate impact on surveillance.

METHODS

- A survey was developed with questions focused on culture-independent rapid diagnostic practices for *Campylobacter* spp. and *Cryptosporidium* spp. utilized by Maine clinical laboratories
- Telephone interviews were conducted with 36 Maine clinical laboratories (34 hospitals and 2 commercial laboratories)
- All responses were entered in an Microsoft Excel database
- Descriptive statistics were calculated
- The database serves as a tool for all Maine CDC infectious disease epidemiologists to use as a reference for the type of test utilized by each clinical laboratory and which allows for more accurate case counting

RESULTS

- Among the 36 clinical laboratories that were surveyed, 25 (69%) perform testing for *Campylobacter*; 1 (3%) performed a culture-independent method
 - 18 of 36 (50%) clinical laboratories performed susceptibility testing on isolates.
- Among the 36 clinical laboratories that were surveyed, 15 (42%) perform testing for *Cryptosporidium* using a culture-independent method, with 2 (13%) laboratories using microscopy to confirm the diagnosis
 - 29 (80%) of the laboratories use the immunochromatographic card/rapid card test
 - 7 (47%) laboratories could not accurately describe the type of test used for cryptosporidiosis testing
 - 5 (14%) laboratories were concerned about false positive results with culture-independent methods

Table 2. Methods used to diagnose *Campylobacter* species at thirty-six Maine clinical laboratories, 2012

	Number	Total Labs	Percent
Perform testing	25	36	69%
Culture	24	25	96%
Culture-independent method	1	25	4%
Reference laboratory	11	36	31%

Table 3. Methods used to diagnose *Cryptosporidium* species at thirty-six Maine clinical laboratories, 2012

	Number	Total Labs	Percent
Perform testing	15	36	42%
Microscopy	2	15	13%
Culture-independent method	15	15	100%
Reference laboratory	21	36	58%

Table 4. Stool cultures and the organisms tested for by culture at thirty-six Maine clinical laboratories, 2012

	Number	Total Labs	Percent
Perform stool cultures	25	36	69%
Perform susceptibility testing	18	36	50%
Culture for <i>Salmonella</i> , <i>Shigella</i> , and <i>Campylobacter</i>	25	25	100%
Culture for <i>Vibrio</i>	8	25	32%
Culture for <i>Yersinia</i>	15	25	60%
Culture for an <i>E.coli</i> variant	14	25	56%
Culture for <i>Aeromonas</i> , <i>Plesiomonas</i> or <i>Bacillus cereus</i>	6	25	24%

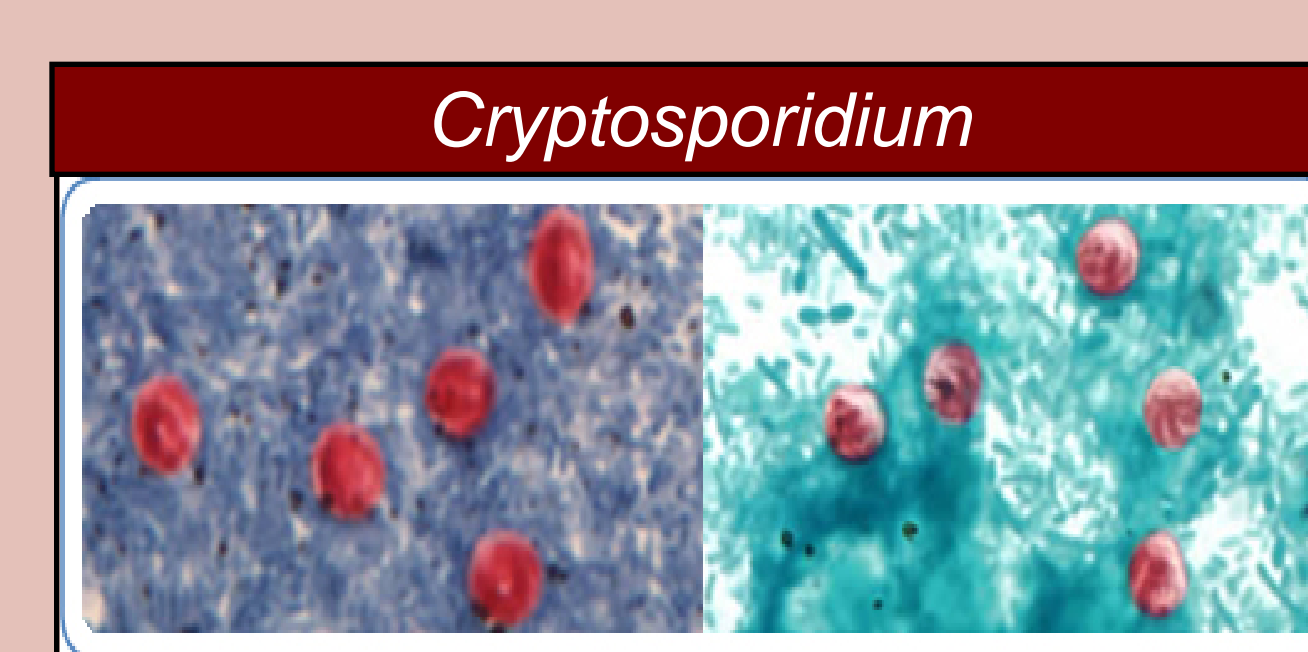
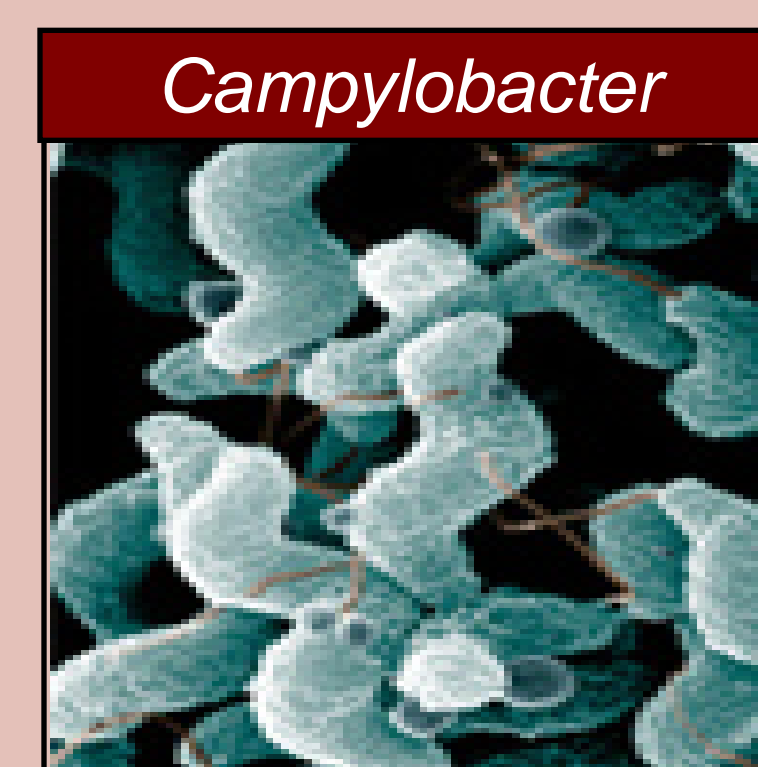


Table 5. Reference laboratories used for *Campylobacter* specimen testing by Maine clinical laboratories, 2012

	Number	Total Labs	Percent
Reference lab	11	36	31%
ALI	6	11	55%
Quest	2	11	18%
CMMC	2	11	18%
NorDx	1	11	9%
HETL for confirmation	12	36	33%

Table 6. Reference laboratories used for *Cryptosporidium* specimen testing by Maine clinical laboratories, 2012

	Number	Total Labs	Percent
Reference lab	21	36	58%
ALI	6	21	29%
Quest	7	21	33%
CMMC	1	21	5%
NorDx	3	21	14%
ARUP	12	21	57%
Mayo	2	21	10%
HETL for confirmation	8	36	22%

CONCLUSIONS

- The information captured in this survey provides a better understanding of the types of diagnostic tests utilized in Maine clinical laboratories. With this information public health officials throughout the state will have a better sense of the accuracy of reports of enteric disease and the burden of illness.
- The immunochromatographic card/rapid card test is not a confirmatory test for public health surveillance.
- The database is used to review and update surveillance classifications for campylobacteriosis and cryptosporidiosis statewide.
- Maine CDC staff is collaborating with national organizations concerning the impact of culture-independent testing methods for public health surveillance.

ACKNOWLEDGMENTS

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