

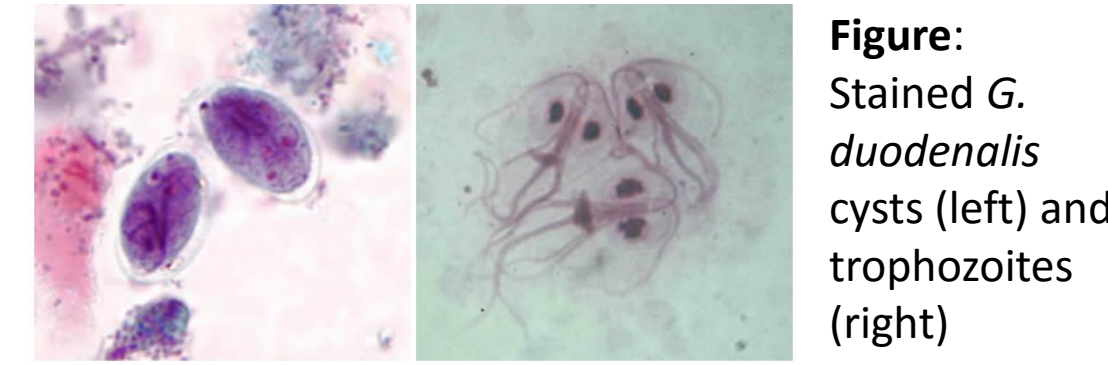
Evaluating the Effectiveness of Giardiasis Surveillance for Immigrant, Refugee and International Adoptee Populations, 2008-2014

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BACKGROUND: Giardiasis

- A nationally notifiable gastrointestinal illness caused by the parasite *Giardia intestinalis*.
- Recognized as a leading cause of waterborne illness in Ohio and the United States.
- The 1997 case definition required only laboratory demonstration of *Giardia* organisms, antigen, or DNA in a biological specimen to be classified as confirmed.
- In 2011, the case definition was revised, also requiring the presence of gastrointestinal symptoms to be classified as confirmed.
- Prior infection:
 - Confers partial immunity to subsequent symptomatic infections.¹
 - Nearly 33% of individuals from developing countries have been previously infected.²
 - Refugee, immigrant, and international adoptee populations (hereby referred to as “foreign-born”) with positive screening tests are often asymptomatic upon entry into the U.S.³
- With the changed case definition, there is an increased need for patient follow-up to determine symptomology; there is concern that limited English proficiency and the resettlement process may limit follow-up, resulting in inappropriate case status classification.



OBJECTIVES

- Characterize the change in number of confirmed cases of giardiasis among foreign-born populations compared to U.S.-born populations.
- Describe the changes in case status classification among foreign-born populations compared to the U.S.-born after the 2011 change in case definition.

METHODS

- Giardiasis case report data were extracted from the Ohio Disease Reporting System (ODRS) for years 2008–2014 (N=5589).
- To identify immigrant, refugee, and international adoptee populations, case notes were searched for text containing key words “immigra*,” “refuge*,” and “adopt*” (n=1341).
- Of all individuals with a positive laboratory test for giardiasis (n=5101), reports classified as “confirmed” with no indicated symptomology were identified (n=3473); “non-cases” with unknown, missing, or evident symptomology (n=194) were also identified.
- Case notes were analyzed for common patterns and themes related to timing of reports, patient follow-up, and interview completion.

OHIO DEPARTMENT OF HEALTH

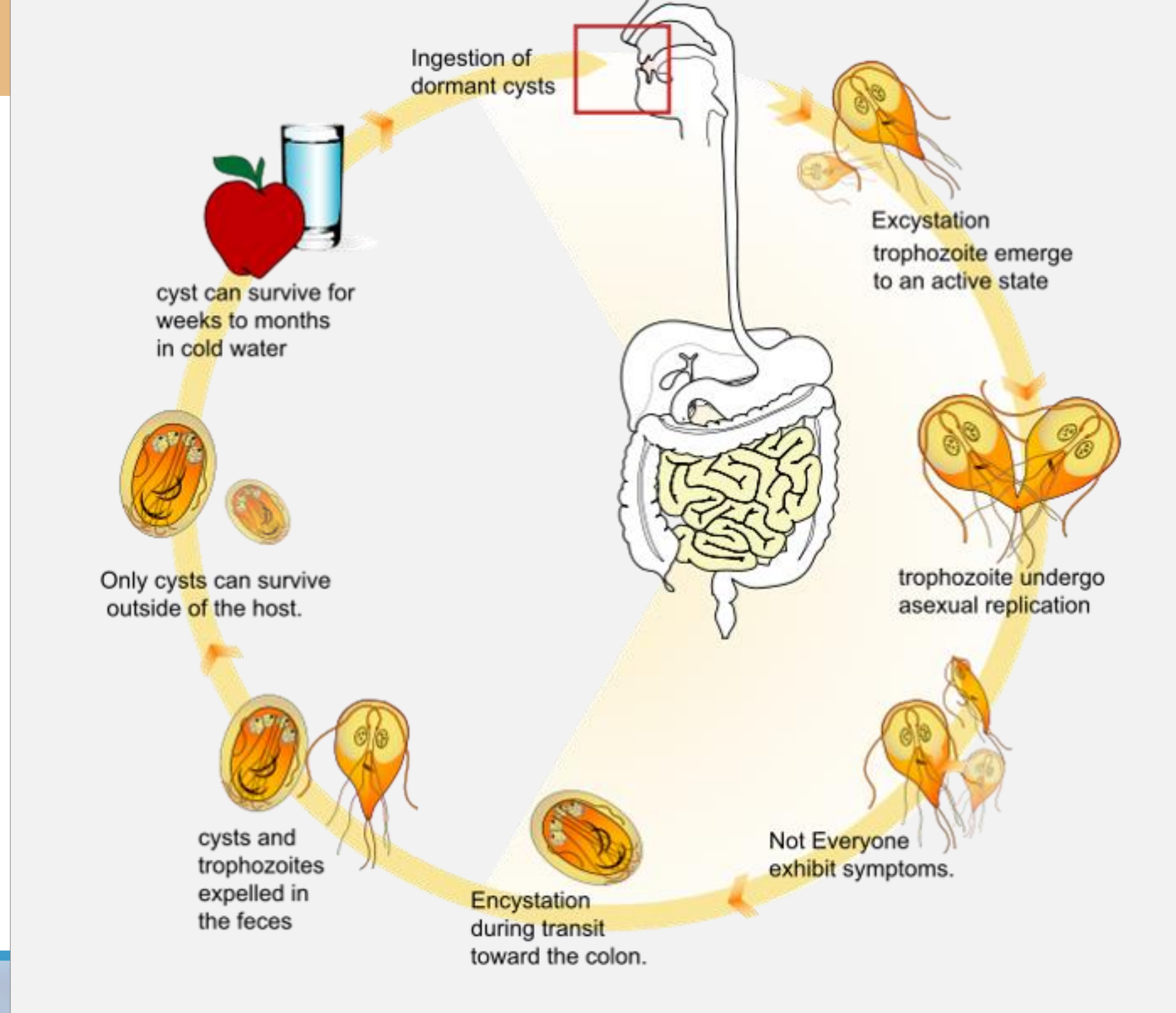
Giardia Case Management

Because *Giardia* cysts can be excreted intermittently, multiple stool collections increase testing sensitivity. Three stool samples should be taken within a 10-day period and spaced 48 hours apart. Use of concentration methods and trichrome staining might not be sufficient to identify *Giardia* because variability in the concentration of organisms in the stool can make this infection difficult to diagnose. Fecal immunoassays that are more sensitive and specific should be used.

Giardiasis diagnostic testing has been intermittently available by the Ohio Department of Health Laboratory from 2008-2014; when not available, local health departments work with medical providers to arrange testing.

All cases reported to a local health department should be followed up with a telephone call to obtain demographic and epidemiologic data, including evidence of symptomology.

Giardia Life Cycle



OHIO DEPARTMENT OF JOB AND FAMILY SERVICES

Refugee Health Screening Program

In Ohio, the Refugee Health Screening process is administered by the Ohio Department of Job and Family Services (ODJFS) Refugee State Coordinator’s Section. The department has a responsibility to ensure that medical screening will be made available to refugees in accordance with the regulations established by the federal Office of Refugee Resettlement (ORR) and requirements detailed in ORR State Letter #04-10 and 45 Code of Federal Regulation (CFR) Part 400.107.

Purpose of the Refugee Health Screening Program is to eliminate health-related barriers to successful resettlement while protecting the health of the U.S. population by:

- Evaluating current health status and identifying health problems.
- Ensuring follow-up of refugees with identified conditions.
- Ensuring refugees are referred for follow-up care.

CONCLUSIONS

- The 2011 change in case definition has substantially impacted case classification for refugees, immigrants, and international adoptees, but not for U.S.-born populations.
- Foreign-born populations with positive laboratory results for giardiasis have distinct barriers to follow-up (e.g., resettlement, limited English proficiency, etc.), which has led to case loss to follow-up.
- Failure to classify reports of giardiasis according to the revised case definition undermines surveillance data for the state and results in a portion of the population being overlooked for follow-up and treatment.
- Promotes the possibility of continued giardiasis transmission; infected persons have been reported to shed 10^8 - 10^9 cysts in their stool per day and to excrete cysts for months, even in the absence of symptoms.¹

RECOMMENDATIONS

- Add a question to the ODRS investigation report form that would allow for early identification of case reports by national origin in much the same way race and ethnicity are identified.
- Partner with the ODJFS Refugee Health Screening Program for improved reporting of giardiasis screening results, symptomology, and patient follow-up into ODRS.

LIMITATIONS

- Case reports have incomplete data on race, ethnicity, and national origin; it was possible that some refugees, immigrants, and international adoptees were missing from this analysis.
- The causality of the dramatic decrease in number of confirmed cases among foreign-born could not be determined. Hypotheses include inability to contact (1.3%), language barriers (1.0%), or use of inappropriate laboratory screening assays (11.4%).

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REFERENCES

- Painter JE, Gargano JW, Collier SA, Yoder JS. Giardiasis Surveillance — United States, 2011–2012. *MMWR*. 2015; 64(SS03):15-25.
- Centers for Disease Control and Prevention (CDC). Parasites – Giardia: Sources of Infection & Risk Factors. <http://www.cdc.gov/parasites/giardia/infection-sources.html>. Updated Jul 21, 2015. Accessed Feb 22, 2016.
- Center for Food Safety and Public Health. Giardia Enteritis, Lambliasis, Beaver Fever. <http://www.cfsph.iastate.edu/Factsheets/pdfs/giardiasis.pdf>. Updated 2012. Accessed Mar 10, 2016.

RESULTS

Table 1: Demographics of all Individuals with Positive Laboratory Test Results for Giardiasis, by Nationality, 2008-2014

	U.S.-Born		Foreign-Born	
	N	%	N	%
Total	3760	73.7	1341	26.3
Sex				
Male	2094	55.7	730	54.4
Female	1651	43.9	555	41.4
Age (years)				
0-4	623	16.6	471	35.1
5-10	356	9.5	309	23.0
11-14	151	4.0	114	8.5
15-19	179	4.8	110	8.2
20-24	235	6.3	93	6.9
25-29	191	5.1	68	5.1
30-34	226	6.0	53	4.0
35-39	227	6.0	32	2.4
40-44	265	7.1	19	1.4
45-49	266	7.1	21	1.6
50-54	223	5.9	12	0.9
55-59	221	5.9	17	1.3
60-64	175	4.7	5	0.4
65-69	158	4.2	8	0.6
70-74	97	2.6	4	0.3
75-79	64	1.7	1	0.1
>80	99	2.6	3	0.2
Race				
White	2293	61.0	185	13.8
Black	427	11.4	265	19.8
Asian	95	2.5	276	20.6
Multiple	27	0.7	30	2.2
Other	105	2.8	114	8.5
Ethnicity				
Hispanic	78	2.1	25	1.9
Non-Hispanic	1903	50.6	590	44.0
Ohio Region				
Northwest	449	11.9	53	4.0
Northeast	1523	40.5	496	37.0
Central	756	20.1	557	41.5
Southwest	804	21.4	213	15.9
Southeast	228	6.1	22	1.6

Table 2: Giardiasis Reports Classified as “Confirmed” with None, Missing, or Unknown Symptomology, by Year and Nationality, 2008-2014

Year	U.S.-Born		Foreign-Born		Total
	N	%	N	%	
2008	729	100.0	146	100.0	875
2009	609	100.0	180	100.0	789
2010	644	100.0	211	100.0	855
2011	607	99.8	88	97.8	695
2012	128	29.2	51	54.4*	179
2013	54	13.2	25	43.1*	79
2014	1	0.3	0	0.0	1
Total	2772	79.8	701	20.2	3473

*Difference in proportions is statistically significant ($p < 0.01$)

Qualitative Analysis of Case Notes for Themes Related to Timing of Reports, Patient Follow-up, & Interview Completion

“Have left a number of voice messages for ordering physician [at screening facility] and have not received a phone call back. This case is lost to follow-up and will be closed.”

“Since no additional information has been received from the health care provider or local health department, and the communicable period has lapsed, this case is being closed with a status of “NOT A CASE.”

“No response [from patient] to repeated phone calls and messages for investigation. Letter mailed after failure to contact by phone; no response. Case is lost to follow-up.”

“Due to patient not speaking English, an interview will not be conducted, also a letter will not be able to be sent to the patient. Patient will be considered lost to follow-up.”

Figure 1: Change in Giardiasis Reports Classified as “Confirmed,” by Year and Nationality, 2008-2014

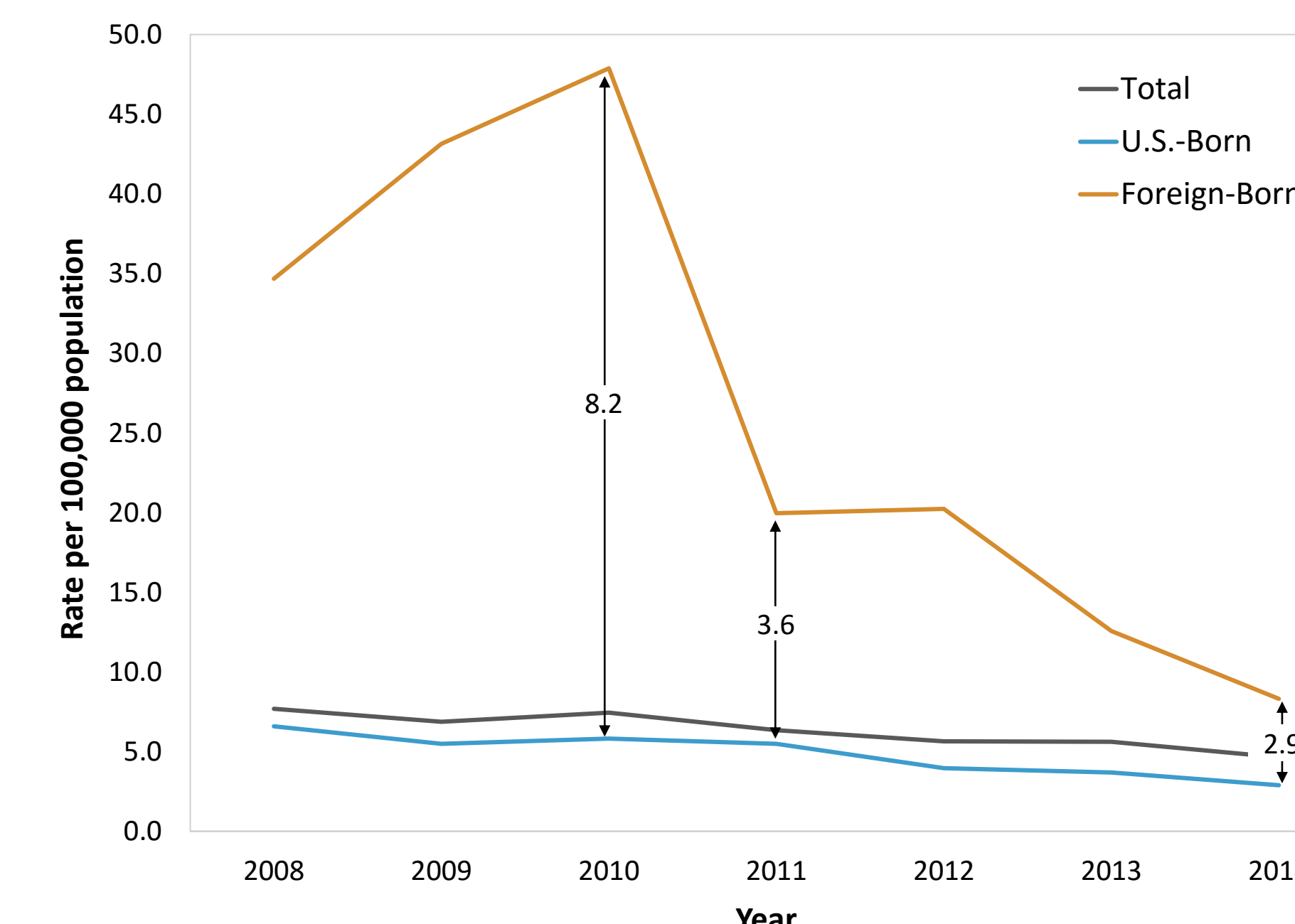


Figure 2: Foreign-Born Giardiasis Reports Classified as “Not a Case,” by Year and Follow-Up, 2008-2014

