

Use of the Cyclosporiasis National Hypothesis Generating Questionnaire by U.S. Public Health Jurisdictions, 2014–2016

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BACKGROUND

- Cyclosporiasis is an intestinal illness caused by the parasite *Cyclospora cayentanensis*, which is transmitted through ingestion of fecally contaminated food or water.
- Cyclosporiasis is most common in tropical and subtropical regions and is not known to be endemic in the United States.
 - U.S. foodborne outbreaks have been linked to imported fresh produce (e.g., basil, cilantro, raspberries).
 - Molecular typing methods, which could facilitate linkage of cyclosporiasis cases, are not yet available for *C. cayentanensis*.
- Cyclosporiasis became a nationally notifiable condition in 1999. As of 2016, it was a reportable condition in 45 jurisdictions: 43 states, the District of Columbia (D.C.), and New York City (NYC) (Figure 1).
 - Health departments notify CDC, via the National Notifiable Disease Surveillance System, of cases that meet the case definition and provide additional information using a CDC Case Report Form.
 - During peak months of reported cases (typically, May–August), CDC requests that health departments administer the Cyclosporiasis National Hypothesis Generating Questionnaire (CNHGQ) to persons with laboratory-confirmed or probable (epidemiologically linked) cases.

CNHGQ

- Developed to improve timeliness and consistency of data collection, to facilitate detection and investigation of outbreaks of cyclosporiasis.
- First used during the 2014 spring/summer outbreak season as a fillable PDF; electronic version available beginning in 2015.
 - For the electronic version, jurisdictions request a unique URL and passcode from CDC for each case.
 - If requested by a jurisdiction, a line-list of data submitted electronically can be provided via Excel for local analysis.
- Designed to be administered over the telephone by public health officials to case-patients or their proxies and to be submitted thereafter to CDC.
- Collects demographic information and data about exposures of potential relevance during the period of interest (typically, the 14-day period before illness onset), such as travel history, social events, fresh produce consumption, and points of service (e.g., grocery stores and restaurants).
 - Food frequencies (nationally and by region) are calculated for each fresh produce exposure; data are used to calculate odds ratios and to test for significance of findings.

Objective

- Assess usage of the CNHGQ by public health jurisdictions during the first 3 years of implementation.

METHODS

- Restricted the analyses to laboratory-confirmed and probable cases of cyclosporiasis that were reported to CDC that occurred in persons with illness onset during May–August, 2014–2016.
- Classified jurisdictions that notified CDC of ≥ 1 case according to whether the jurisdiction used the CNHGQ (or a state-adapted version) for at least 1 case-patient; jurisdictions that reported ≥ 1 case were included in the analyses regardless of whether cyclosporiasis was a reportable condition during the pertinent year (see footnote, Figure 2).
- Calculated aggregate annual proportion of case-patients to whom the CNHGQ (PDF or electronic) was administered, the subset administered the electronic version, and the subset who reported no history of international travel during the pertinent exposure period.
- Calculated annual proportion of jurisdictions that used the CNHGQ (PDF or electronic) at least once, as well as the subset that used the electronic version at least once.

RESULTS

- For the 3-year period of 2014–2016, 37 (88%) of the 42 jurisdictions that notified CDC of ≥ 1 case used the CNHGQ at least once (Figure 2).
- Among the 41 jurisdictions that reported ≥ 1 case for the period of 2015–2016 (i.e., when the electronic CNHGQ was available), 36 jurisdictions (88%) utilized the CNHGQ (PDF or electronic) at least once, 22 (61%) of which utilized the electronic version at least once.
- Over the 3-year period:
 - The annual proportion of case-patients to whom the CNHGQ was administered increased from 17% in 2014 to 62% in 2016 (Figure 3; Table 1).
 - Among case-patients who reported no history of international travel during the pertinent exposure period, the proportion who were administered the CNHGQ increased from 19% in 2014 to 82% in 2016 (data not shown).
 - The annual proportion of jurisdictions that used the CNHGQ at least once increased from 43% in 2014 to 86% in 2016 (Table 1).
 - Among jurisdictions that used the CNHGQ (PDF or electronic) at least once, the proportion that used the electronic version at least once increased from 47% in 2015 to 56% in 2016 (Table 2).

Figure 2. Use of the CNHGQ by U.S. public health jurisdictions* for at least one case-patient with illness onset during May–August, 2014–2016

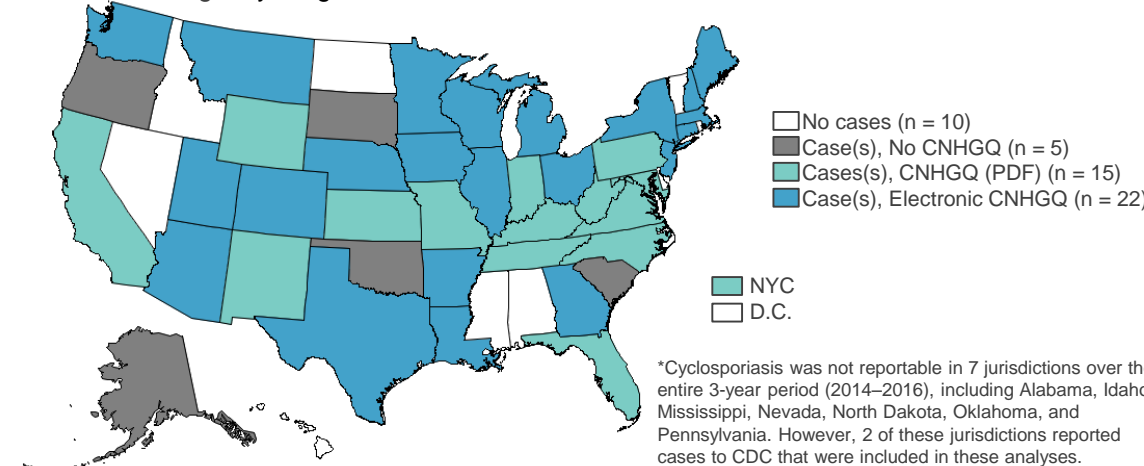


Figure 1. Cyclosporiasis reportability,* 2016

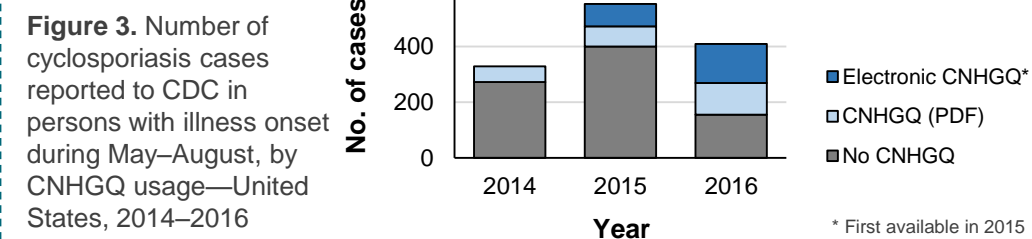
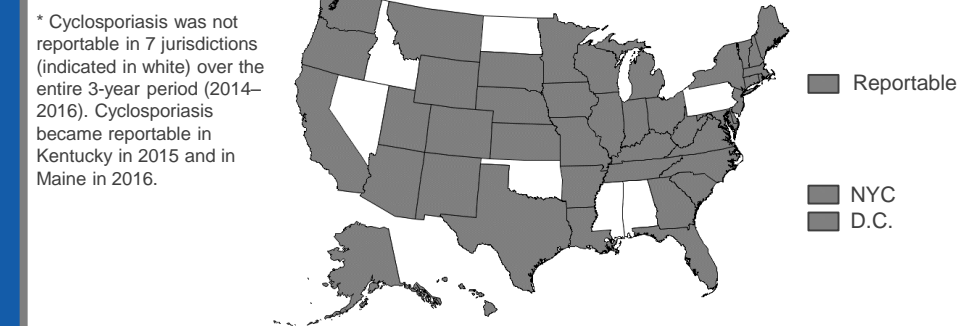


Table 1. CNHGQ usage by case count and jurisdiction, among case-patients with illness onset during May–August—United States, 2014–2016

Year	Total no. cases	No. case-patients administered CNHGQ		%	Total no. jurisdictions that reported cases	No. jurisdictions that used CNHGQ		%
		No. case-patients administered CNHGQ	%			No. jurisdictions that used CNHGQ	%	
2014	328	56	17%		30	13	43%	
2015	552	152	28%		32	19	59%	
2016	409	254	62%		37	32	86%	
Total	1,289	462	36%					

Table 2. Electronic* CNHGQ usage among case-patients who were administered the CNHGQ and jurisdictions that used the CNHGQ at least once, in persons with illness onset during May–August—United States, 2015–2016

Year	Total no. case-patients administered CNHGQ	No. case-patients administered electronic CNHGQ		%	Total no. jurisdictions that used CNHGQ	No. jurisdictions that used electronic CNHGQ		%
		No. case-patients administered electronic CNHGQ	%			No. jurisdictions that used electronic CNHGQ	%	
2015	152	80	53%		19	9	47%	
2016	254	140	55%		32	18	56%	
Total	406	220	54%					

* First available in 2015

CONCLUSIONS

- Use of the CNHGQ increased each year after it was first introduced in 2014.
 - A higher proportion of case-patients were administered the CNHGQ each year from 2014 to 2016; use of the electronic version also increased.
 - Most jurisdictions that reported ≥ 1 case in a person with illness onset during May–August used the CNHGQ at least once during 2014–2016.
 - The proportion of jurisdictions that used the CNHGQ at least once doubled from 2014 to 2016.
- Among case-patients with no reported history of international travel during the pertinent exposure period, the proportion administered the CNHGQ increased 63% from 2014 to 2016; the proportion of all case-patients administered the CNHGQ during this same period increased 45%.
 - Compared with all case-patients, a higher proportion of case-patients who reported no history of international travel during the pertinent exposure period were administered the CNHGQ.
- The electronic CNHGQ eliminates the data entry step at CDC, which allows CDC epidemiologists to analyze aggregate data and share relevant epidemiologic findings with health departments and FDA more quickly (data not shown).
- Use of the CNHGQ by jurisdictions is expected to improve outbreak detection and the identification of potential vehicles of infection.

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