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A Case Series of Reports to US Port Health Stations of Travelers With Suspected or Confirmed Cholera, 2005–2024

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Abstract

From 2005 to 2024, the Centers for Disease Control and Prevention's port health stations (PHSs) received 37 reports of travelers with suspected or confirmed cholera. Most reports (29/37, 78%) occurred before 2012, with the majority linked to the 2010 Haiti outbreak. The median age of travelers was 34 years (interquartile range: 21–59 years), and nearly all (35/37, 95%) arrived by

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T.H.N. was the lead author of this paper, responsible for drafting the manuscript, conducting the analysis, and extracting the data. K.B. assisted with data extraction, cleaning, and analysis, and contributed to writing and revising the manuscript. E.R., F.A.R., C.B., and S.M. provided subject matter expertise, reviewed the data, and participated in manuscript revisions. C.C.L. contributed significantly by cross-checking the data used in the analysis against CDC DFWED's records, helping to ensure data accuracy and completeness, thereby strengthening the validity of the findings. A.M.G. served as the senior author, playing a key role in the paper's conceptualization and overall direction, contributing to the study's design, guiding the interpretation of the findings, and actively participating in revising and editing the manuscript for intellectual content.

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This activity, a secondary data analysis of data collected during routine operational work, was reviewed by CDC (STARS ID: 0900f3eb821d861c), deemed non-research, and therefore did not require submission to the CDC Institutional Review Board. The operational work conducted was consistent with applicable federal law and CDC policy. (45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.)

The findings and conclusions of this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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air. Seventeen (46%) cases were laboratory-confirmed as toxigenic *Vibrio cholerae* O1, serotype Ogawa; 16 (94%) patients with confirmed cholera were hospitalized. No deaths were reported. Following the publication in 2011 of notification criteria for communicable diseases in travelers, health department notifications to PHSs of cholera cases declined. Continued coordination with public health partners is important to ensure timely evaluation and follow-up of travelers with suspected cholera. Clinicians should obtain travel histories and consider cholera in recent travelers with severe watery diarrhea who have been in outbreak or endemic areas.

Keywords

air-travel; border health; cholera

Cholera, caused by toxigenic strains of the bacterium *Vibrio cholerae* O1 or O139, is an acute gastrointestinal infection primarily transmitted through fecal-oral routes, such as contaminated food or water, or through person-to-person contact.[1,2] Although it is rare for travelers to contract cholera during visits to endemic regions, cases of infection during travel have been documented in the literature.[1,3,4]

The US Centers for Disease Control and Prevention (CDC) maintains protocols for managing travelers reported during or after travel with suspected or confirmed communicable diseases of public health concern, including cholera. Operators of any aircraft or vessel destined for a US port of entry are required to report to the CDC on any traveler on board whose signs or symptoms of illness meet the regulatory definition of an "ill person."* The CDC additionally receives notifications of communicable diseases of public health concern in recent travelers from US health departments (HDs) when public health action might be needed. In 2011, the CDC and the Council of State and Territorial Epidemiologists (CSTE) jointly published criteria for notifications between HDs and CDC port health stations (PHSs) regarding communicable diseases in travelers on commercial aircraft or maritime vessels, to facilitate public health follow-up.[5] These criteria were most recently updated in 2025.[6] Current protocol advises HDs to consider notifying PHSs of confirmed cholera cases in aircrew or cargo vessel crew if the individual had food or beverage-handling responsibilities while infectious. Notification is also recommended if there was known fecal contamination of surfaces—such as seats or lavatories—and if other travelers were believed to have come into contact with those surfaces.[6] Cases of gastrointestinal illness aboard cruise ships are reported to and managed by the CDC's Vessel Sanitation Program (VSP).

Data reported to CDC PHSs regarding ill travelers are stored in the CDC's secure Port Health Activity Reporting System (PHARS) database, which serves as a record of public health activities and outcomes. This case series describes travelers who entered the United States by air, land border crossing, or maritime vessel and were reported to CDC PHSs as suspected or confirmed to have cholera during or after travel.

*42 C.F.R part 71.1.

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Methods

PHARS was queried to identify records from June 2005 to June 2024 for individuals with recent travel and suspected or confirmed cholera. Variables extracted and analyzed included traveler characteristics, travel information (departure and arrival locations, conveyance type), clinical information (reported symptoms, laboratory results), whether a conveyance contact investigation was conducted, and any secondary cases identified during follow-up. To determine the final destination, we used the destination or US address listed in the report or the reporting state, depending on the availability of data. To identify reports in PHARS, cholera cases were defined as symptoms compatible with cholera and a documented positive laboratory test, while suspected cholera cases were defined as compatible symptoms, but no documented positive laboratory test. De-identified data were analyzed descriptively using Excel, with 2 duplicate reports excluded. In addition, cruise-related cases are not regularly reported in PHARS; therefore, cruise-related reports were excluded from the analysis.

Cases identified in PHARS were cross-referenced with CDC cholera laboratory data to confirm positive results for toxigenic *Vibrio cholerae*. To report these results, we defined "confirmed cholera" as those for which a laboratory result confirmed the presence of toxigenic *Vibrio cholerae*, and we defined "non-cholera" as any cases that did not have a confirmed toxigenic laboratory result.

This activity, a secondary data analysis of data collected during routine operational work, was reviewed by the CDC (STARS ID: 0900f3eb821d861c) and deemed non-research; therefore, it did not require submission to the CDC Institutional Review Board. The operational work conducted was consistent with applicable federal law and CDC policy.[†]

Results

Thirty-seven non-duplicate reports for travelers with a suspicion of cholera were identified in PHARS during the analysis period. The majority (29/37, 78%) of reports were received before 2012, and of those, almost all (26/29, 90%) were reported during 2010–2011 (Supplementary Digital Content Figure 1, available at http://links.lww.com/JPHMP/B561).

Of the 37 reports, 35 (95%) involved air travel, 1 (3%) involved land travel, and 1 (3%) had an unknown mode of travel. For the 32 reports that included age, the median age reported was 34 years (interquartile range: 21–59 years). CDC PHSs were notified by HDs (26/37, 70%), US Customs and Border Protection (3/37, 8%), other CDC programs (2/37, 5%), fire rescue (1/37, 3%), an airline (1/37, 3%), and a hospital (1/37, 3%). Among the 30 reports that included country of travel origin, 22 (73%) indicated Haiti as the origin (Table 1). Nineteen of the 37 reports (51%) listed Florida as the traveler's final destination and 22 (59%) were reported to the Miami PHS (Table 1). Additional information on travel origins, US destinations, demographics, and reported symptoms is summarized in Table 1.

Twenty-three of the 37 (62%) reports included laboratory results, and 17 (46%) cases were confirmed as positive for toxigenic *Vibrio cholerae* by CDC laboratory records. The

[†]45 C.F.R. part 46.102(l)(2), 21 C.F.R. part 56; 42 U.S.C. Sect. 241(d); 5 U.S.C. Sect. 552a; 44 U.S.C. Sect. 3501 et seq.

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remaining 6 reports listed the following laboratory results: 3 (50%) had negative test results, 2 (33%) had positive results for non-toxigenic *Vibrio cholerae*, and 1 (17%) had positive results but could not be confirmed in CDC laboratory records. All 17 confirmed cases were identified as *Vibrio cholerae* serogroup O1, serotype Ogawa. Sixteen (94%) of the travelers with confirmed cholera were hospitalized. Of the 14 hospitalized individuals for whom age was available, 2 (14%) were pediatric (range: 2–9 years), 9 (64%) were aged 18–61 years, and 3 (21%) were older adults (range: 70–73 years).

None of the reports indicated that a contact investigation was warranted on any conveyance according to CDC protocol. Cholera infection did not result in any deaths in this cohort.

Discussion

Over the past 19 years, CDC PHSs have received 37 reports of suspected cholera among travelers (after exclusion of a cruise-related case), with nearly half of those cases confirmed as toxigenic *Vibrio cholerae* through laboratory testing. The majority of cases occurred before 2012 and were linked to the 2010 Haiti outbreak.

There are a number of limitations to this analysis. Data reported to PHSs were manually entered into PHARS by PHS staff, and some entries were incomplete or contained errors. Many reports lacked laboratory confirmation, meaning some illnesses may have been caused by pathogens other than toxigenic *Vibrio cholerae*, and some cholera cases may have been missed. Even among cases with reported positive lab results, some lacked sufficient documentation to confirm whether the case definition was met.[7] This was partly due to the broad case definition and the frequent lack of clinical specificity in report entries, which often listed only general symptoms such as “diarrhea.” Cases may have gone unreported or were incompletely reported to HDs due to variations in clinical presentation and other factors, limiting the effectiveness of surveillance efforts. Cruise-related cases were excluded from this analysis, as they are reported to the CDC’s VSP. Furthermore, a 2011 change in CDC reporting guidance limited the requirement to notify PHSs of cholera cases in travelers to specific circumstances, resulting in a decrease in the number of reports to PHSs. However, since cholera cases are typically reported to CDC via the Cholera and Other Vibrio Illness Surveillance (COVIS) system—the primary reporting system for US *Vibrio* infections—this reduction in PHS reports likely did not result in missed cases that posed a true transmission risk during travel. No contact investigations were conducted on conveyances, in accordance with CDC protocols, and no secondary cases were identified. This limits the ability to assess potential transmission dynamics or undetected secondary spread in travel-related settings. Relevant contextual information, such as migration status or whether individuals were visiting friends and relatives (VFR) in cholera-endemic areas, was often missing or not systematically collected, potentially obscuring important risk factors. Occupation data, including whether individuals were engaged in humanitarian response or other high-risk settings, were also inconsistently reported and should be interpreted with caution. Ongoing training for port and airline staff to recognize and report potential infectious illnesses in travelers, especially during outbreaks, remains critical for supporting timely detection and public health response.

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The risk of cholera transmission during air travel is likely low, and cholera does not pose a substantial risk in countries with improved water and sanitation systems, such as the United States.[8] Current PHS reporting recommendations appear sufficient to capture travelers infected with cholera who truly pose a transmission risk. Public health action for travelers with suspected cholera may be necessary on occasion based on individual assessments. When airlines or other port partners notify PHSs about travelers with watery diarrhea, CDC staff can conduct a public health risk assessment, including determination of recent travel to cholera-endemic or outbreak areas. If cholera is suspected, travelers may be referred for medical evaluation and testing in coordination with HDs to ensure cases are not missed and appropriate follow-up care is provided.[9] Clinicians evaluating patients with severe watery diarrhea should obtain a complete travel history and consider cholera testing if the patient reports travel to outbreak or endemic areas.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Implications for Policy & Practice

- Reinforces the importance of maintaining surveillance systems that engage airlines and port authorities in notifying public health staff of travelers presenting with severe watery diarrhea.
- Highlights the need for standardized protocols for public health risk assessments of potentially cholera-infected travelers arriving from outbreak or endemic regions.
- Supports interagency coordination between the CDC, public health departments, and medical providers to ensure prompt evaluation, testing, and appropriate care for suspected cases.
- Emphasizes the critical role of obtaining thorough travel histories during clinical evaluations of patients with acute watery diarrhea to aid in early identification and containment of imported cholera cases.
- Suggests that routine policy reviews and training for frontline personnel at ports of entry could enhance preparedness and reduce the risk of delayed detection of cholera importation events.

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TABLE 1

Characteristics of Air and Land Travelers With Suspected or Confirmed Cholera Reported to the US Centers for Disease Control and Prevention's Port Health Stations From June 2005 to June 2024 (N = 37).

	Confirmed Cholera[a] (n = 17)	Non-Cholera[a] (n = 20)
Characteristics	**N (%)**	**N (%)**
Report sources		
Health department	12 (71)	14 (70)
US Customs and Border Protection	1 (6)	2 (10)
CDC	0	2 (10)
Fire rescue	0	1 (5)
Airline	1 (6)	0
Hospital	0	1 (5)
Unknown	3 (18)	0
Sex		
Male	12 (71)	10 (50)
Female	5 (29)	6 (30)
Unknown	0	4 (20)
Citizenship status		
US citizen or lawful permanent resident	3 (18)	2 (10)
Immigrant	1 (6)	0
Refugee	0	1 (5)
Asylee	0	1 (5)
Unknown	13 (76)	16 (80)
Country of travel origin		
Haiti	12 (71)	10 (50)
Dominican Republic	2 (12)	1 (5)
Pakistan	0	2 (10)
Ghana	0	1 (5)
Ethiopia	0	1 (5)
Taiwan	1 (6)	0
Unknown	2 (12)	5 (25)
Final destination		
Florida	10 (59)	9 (45)
Texas	1 (6)	1 (5)
Virginia	1 (6)	1 (5)
California	1 (6)	1 (5)
Puerto Rico	1 (6)	1 (5)
New York	1 (6)	0
Haiti	1 (6)	0
Massachusetts	0	1 (5)
North Carolina	0	1 (5)
United Kingdom	0	1 (5)

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Characteristics	Confirmed Cholera[a] (n = 17) N (%)	Non-Cholera[a] (n = 20) N (%)
Arkansas	0	1 (5)
Mexico	0	1 (5)
Arizona	0	1 (5)
Maryland	0	1 (5)
Pennsylvania	1 (6)	0
Port health station		
Miami	11 (65)	11 (55)
Los Angeles	1 (6)	1 (5)
New York	2 (12)	0
Houston	1 (6)	1 (5)
San Diego	0	2 (10)
San Juan	1 (6)	1 (5)
Washington, DC	0	2 (10)
Philadelphia	1 (6)	0
Atlanta	0	1 (5)
Chicago	0	1 (5)
Occupation		
Physician	1 (6)	1 (5)
Missionary	1 (6)	1 (5)
Student	1 (6)	0
Retired humanitarian worker	1 (6)	0
Radio journalist	1 (6)	0
Airport clerk	1 (6)	0
Unknown	11 (65)	18 (90)
Traveler symptoms		
Diarrhea	14 (82)	17 (85)
Vomiting	6 (35)	5 (25)
Abdominal pain	4 (24)	3 (15)
Dehydration	3 (18)	1 (5)
Nausea	4 (24)	2 (10)
Other[b]	4 (24)	7 (35)
Unspecified[c]	2 (12)	1 (5)

CDC = Centers for Disease Control and Prevention

[a]Confirmed cholera cases were those with laboratory documentation of toxigenic *Vibrio cholerae*. "Non-cholera" cases were those for which CDC did not have laboratory documentation of toxigenic *Vibrio cholerae*.

[b]Other symptoms reported included sore throat, lethargy, fever, acute renal failure, fatigue, malaise, muscle pain, headache, dizziness, paralysis, flank pain, chest pain, and conjunctivitis.

[c]No symptoms were specified.