$P < 0.0001$] and severe hunger in the household (AOR 1.71, 95% CI 1.42–2.05; $P < 0.0001$) were significantly associated with reported history of cholera in the household after controlling for urban setting, household size, wealth index, water source, time to water source, latrine, and housing materials. Severe hunger in the household (AOR 2.81, 95% CI 1.58–5.00; $P = 0.0005$), but not moderate hunger in the household, was independently associated with reported death from cholera in the household.

Conclusion. This is the first study to identify an independent relationship between household food insecurity and reported history of cholera and death from cholera. The directionality of this relationship is uncertain and should be further explored in future prospective research.

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1104. Deployment-Associated Infectious Gastroenteritis and Associations With Irritable Bowel Syndrome, Post-Traumatic Stress Disorder, and Combat Stress: A Retrospective Cohort Study Among Deployed United States Military Personnel

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Background. Previous studies have shown an association between post-traumatic stress disorder (PTSD) and the development of irritable bowel syndrome (IBS) in deployed service members. Deployment places soldiers at risk for chemical, physical, psychological, and infectious stressors. Acute stress can alter the gastrointestinal barrier leading to gut barrier dysfunction, which is an independent risk factor for infectious gastroenteritis (IGE). We sought to assess if there was an association between IBS and PTSD in military deployed in support of recent and ongoing military operations.

Methods. We conducted a retrospective cohort study of United States service members who participated in a combat deployment to the Middle East from 2001 to 2013 with no prior Axis I disorders or PTSD diagnoses based on data from the Defense Medical Surveillance System. Univariate and multivariate logistic regression models were used to assess the differential risk of PTSD following a combat deployment among those with and without a predeployment diagnosis of IBS. These models were controlled for confounders/covariates of interest (IGE, age, duration of deployment, sex, race, marital status, education level, military rank, branch of service, number of deployments).

Results. Among the 3825 subjects, those who developed IGE had a 34% ($P = 0.02$) increased risk of PTSD compared with those with no IGE during deployment. Additionally, those with IBS predeployment had a 40% ($P = 0.001$) increased risk of PTSD upon return from deployment compared with those without IBS predeployment. Duration of deployment was significantly ($P < 0.0001$) associated with PTSD with an increasing risk with increasing duration of deployment.

Conclusion. IGE and IBS were significantly associated with PTSD further supporting previous studies describing their association. Baseline chronic dysbiosis and acute stress-related microbiota perturbations may lead to short- and long-term resilience and performance deficits in our soldiers that may compromise mission capabilities and decrease the quality of life in returning soldiers. Further understanding the potential interactions between the gut–brain–microbiome may have immediate and long-term impacts on improving warfighter health and performance.

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1105. Vibriocidal Titer Variation and Likelihood of Protection in Children Compared With Adults in a Cholera Endemic Area

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Background. *Vibrio cholerae*, the causative agent of cholera, is responsible for significant morbidity and mortality worldwide. Children less than 5 years old have the highest disease burden of cholera in endemic areas. While children develop serum vibriocidal antibody responses to cholera vaccines, they derive less protection from vaccination compared with adults. The aim of our study was to determine whether the vibriocidal immune responses to *V. cholerae* infection are equally accurate as markers of protection in all age groups.

Methods. Cholera patients and their household contacts, who are known to be at high risk of *V. cholerae* infection, were enrolled between 2001 and 2017 in Dhaka, Bangladesh. Baseline vibriocidal titers were measured at the time of enrollment of household contacts, and participants were followed prospectively for development of *V. cholerae* infection.

Results. We studied 50 contacts < 5 years old ("young children"), 228 contacts 5–16 years old ("older children"), and 548 contacts > 16 years old ("adults"). The baseline serum vibriocidal titer was higher in contacts who remained uninfected from all age groups than in contacts who developed cholera during the follow-up period (young children: $P = 0.0092$; older children: $P = 0.0003$, adults: $P = 0.0012$).

Conclusion. We found that higher vibriocidal antibody titers were associated with protection against *V. cholerae* infection across all three age categories. These findings may help increase our understanding of the protective immune response against *V. cholerae* infection and have importance for future vaccine development strategies.

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1106. Infectious Etiologies of Acute Gastroenteritis in Children during the First 100 Days Post-Allogeneic Hematopoietic Cell Transplant

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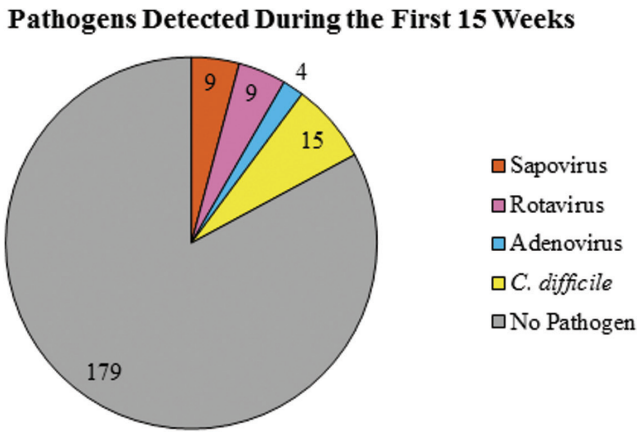
Background. Acute gastroenteritis (AGE) is a frequent sequela in children undergoing hematopoietic cell transplant (HCT). Although rotavirus and norovirus have been implicated as important causes of AGE, the frequency of other pathogens is unknown. Little data exist on longitudinal prevalence of infectious AGE in HCT.

Methods. From February 2015 to May 2016, subjects <18 years undergoing allogeneic HCT were enrolled at four CDC-NVSN sites: Oakland, Kansas City, Seattle, and Nashville. Stool samples were collected at enrollment, weekly until discharge or day 100 (whichever occurred earliest), during re-admissions within the first 100 days, and day 100. AGE was defined as unexplained ≥3 episodes diarrhea and/or ≥1 episode vomiting/24 hours. Specimens were tested using Luminex xTAG Gastrointestinal Pathogen Panel (Austin, TX) and real-time PCR for adenovirus, astrovirus, norovirus, and sapovirus.

Results. Thirty-one patients were enrolled at four sites (Seattle: 13, Kansas City: 8, Oakland: 6, Nashville: (4) with median age 5 (IQR 3–10) years. Two hundred sixteen samples were obtained with median 7 samples/subject. During the first 100 days, 29 (94%) subjects met the AGE definition. Thirty-six single pathogen detections occurred in 16 (52%) subjects. *Clostridium difficile* was the most frequent pathogen (Figure 1), with 14 detections in nine patients, all ≥3 years; 50% of detections were asymptomatic. Seven (50%) detections occurred at HCT onset and none received targeted *C. difficile* therapy. Sapovirus was detected nine times in four patients, with seven (78%) detections associated with AGE symptoms. Rotavirus was detected nine times, during five symptomatic episodes, in three patients. Adenovirus was detected four times in three patients and all were symptomatic.

Conclusion. We longitudinally characterized the etiology of infectious AGE in children undergoing HCT. Despite the majority of patients meeting the definition for AGE, only half had a pathogen detected, suggesting that differentiating infectious vs. noninfectious AGE (e.g., medication induced) in this population is difficult. Although all subjects with adenovirus and most with sapovirus were symptomatic, asymptomatic *C. difficile* detection was common. Interestingly, norovirus was not detected. Further investigation of AGE is warranted in this population.

Figure 1. Pathogens detected during the first 100 days post-HCT.



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