# Diarrhoea in travellers

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**Abstract**

Public Health England (PHE) estimates that between 20 and 60% of all international travellers will be affected by a gastrointestinal illness, or traveller's diarrhoea (TD). In most cases this is a self-limiting illness, which improves spontaneously within 3–5 days. Without treatment, 90% will have resolved within a week and 98% within a month of onset. Some individuals develop more severe diarrhoea and become dehydrated or unwell and may experience systemic complications that warrant further attention. The most common causes of diarrhoea in travellers will be described here, along with a general approach to the management of such patients.

**Keywords** diarrhoea; diarrhoea aetiology; diarrhoea treatment; imported fever; traveller's diarrhoea

The diagnosis of traveller's diarrhoea (TD) requires the presence of loose stools on at least three occasions within a 24-hour period, starting either during or shortly after travel abroad. It is commonly associated with nausea and vomiting, less commonly with cramping abdominal pain, fever, urgency, tenesmus and blood or mucus. It can be very disruptive, getting in the way of expensive holiday itineraries and ruining work-related trips. It is important to understand how best to prevent TD, but also how to manage it when the need arises.

## Who gets traveller's diarrhoea?

Host-related factors can predispose to TD, like age, immune status and co-morbidities such as inflammatory bowel disease and diabetes. Medication such as proton pump inhibitors can also predispose to TD by reducing stomach acid, allowing viable organisms to pass in greater numbers into the intestines where they cause disease.

Choice of destination and activity are the most important predictors of disease. Figure 1 shows the three geographical risk zones that have been identified.[1] On the whole, those travelling from resource-rich to resource-poor settings are at greatest risk of TD[2] due to lower quality sanitation. Faeco-oral routes of transmission mean that behaviours such as maintaining hand hygiene can substantially reduce the risk of developing TD.

Choice of food while away is very important. Asymptomatic but infected food handlers are often linked to cases of TD. Avoiding undercooked meat, seafood, salad and ice, eating only fruit one can peel oneself and drinking bottled or purified water rather than tap water will help reduce the risk. Point-source outbreaks can occur with certain types of travel, such as cruise ship holidays.

## What causes traveller's diarrhoea?

Bacteria cause most cases of TD, but a list of organisms have been implicated, which also includes viruses and parasites[3] (Table 1). The organism and the anatomical site at which it is found may determine both the presenting features of the illness (Table 2) and its duration. Acute illnesses that resolve rapidly suggest toxigenic, bacterial and viral causes, while more chronic symptoms may implicate protozoal pathogens and non-infective diagnoses.

## Bacteria (*with toxin-mediated effects)

### *Escherichia coli**

Enterotoxigenic *E. coli* (ETEC) is the most common cause of TD globally. These organisms release either heat-labile or heat-stable toxins. The first of these is structurally related to the cholera toxin, and results in copious amounts of secretary diarrhoea. Other strains include enteroaggregative *E. coli* (EAEC), common in resource-poor settings, and enteroinvasive *E. coli* (EIEC), which is closely related to shigellosis. More recently, the verotoxin produced by enterohaemorrhagic *E. coli* (EHEC), particularly *E. coli* O157, has been associated with haemolytic–uraemic syndrome (HUS).

### *Campylobacter*

This is a common cause of TD associated with eating meat, especially poultry. It presents with fever, abdominal cramps and diarrhoea, and may cause colitis with bloody stool and mucus. It is occasionally associated with complications such as reactive arthritis and Guillain–Barré syndrome, but most often it is self-limiting, requiring treatment only when symptoms are severe or slow to resolve. Unlike most bacterial causes of TD, *Campylobacter* may well not respond to ciprofloxacin.

### *Salmonella*

PHE reports non-typhoidal *Salmonella* spp. as the most common laboratory-confirmed cause of TD,[4] but this relates partly to isolation techniques and reporting of the organism. However, it remains an important cause of TD and while normally self-limiting, may cause more severe disease particularly among those at the extremes of age or who are immunocompromised. *Salmonella typhi* and *S. paratyphi* cause enteric fever rather than TD, but brief diarrhoeal symptoms occasionally precede systemic illness.

### *Shigella**

Humans are the only significant reservoir for this organism and infection can occur with as few as 10 organisms from water contaminated with human faeces. The organism usually affects the colon and is a well-known cause of dysentery (bloody diarrhoea). It is often also associated with fever, abdominal pain and tenesmus. *Shigella dysenteriae* can also cause HUS, mediated by the Shiga toxin. A blood film and renal function tests should be requested when this is suspected.

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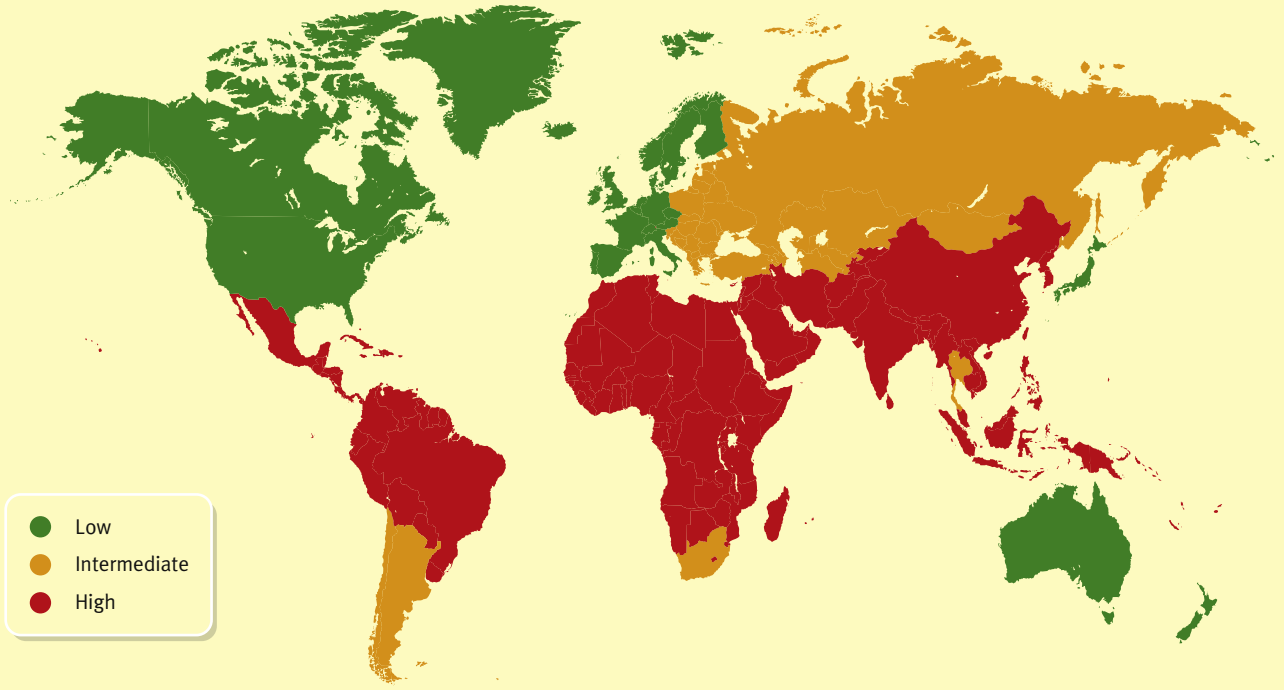
## Variation in risk of acquiring traveller's diarrhoea among international visitors from low-risk regions




High-risk regions include Latin America, Africa and Southern Asia (diarrhoea rates ~40%), moderate-risk regions include China, Russia, the Middle East, Caribbean Islands such as Jamaica, South Africa, southern cone of South America and Thailand (diarrhoea rates 8–15%) and low-risk areas include the USA, northwestern Europe, Japan, Australia and New Zealand (diarrhoea rates <4%)

**Figure 1** From DuPont HL. Systematic review: prevention of travellers' diarrhoea. *Aliment Pharmacol Ther.* 2008;**27**:741—751. With kind permission from John Wiley & Sons.

## Regional distribution of the most common pathogens that cause traveller's diarrhoea

| | Asia | Latin America | Africa |
|---|---|---|---|
| **Bacterial** | | | |
| Enterotoxigenic *Escherichia coli* | 6—37% | 17—70% | 8—42% |
| Other *E. coli* | 3—4% | 7—22% | 2—9% |
| *Campylobacter jejuni* | 9—39% | 1—5% | 1—28% |
| *Salmonella* spp. | 1—33% | 1—16% | 4—25% |
| *Shigella* spp. | 0—17% | 2—30% | 0—9% |
| *Plesiomonas shigelloides* | 3—13% | 0—6% | 3—5% |
| *Aeromonas* spp. | 1—57% | 1—5% | 0—9% |
| **Viral** | | | |
| Rotavirus | 1—8% | 0—6% | 0—36% |
| **Parasitic** | | | |
| *Entamoeba histolytica* | 5—11% | <1% | 2—9% |
| *Giardia lamblia* | 1—12% | 1—2% | 0—1% |
| *Cryptosporidium* spp. | 1—5% | <1% | 2% |
| *Cyclospora cayetanensis* | 1—5%? | <1%? | <1%? |
| No pathogen identified | 10—56% | 24—62% | 15—53% |

From Al-Abri SS, Beeching NJ, Nye FJ. Traveller's diarrhoea. *Lancet Infect Dis* 2005; 5: 349—60. With kind permission from Elsevier.

**Table 1**