



Travellers' Diarrhoea

Introduction

Travellers' diarrhoea (TD) is the most common syndrome affecting travellers. It is caused by many different bacteria, viruses, and parasites, most of which are endemic worldwide. The most common cause is enterotoxigenic *Escherichia coli* (ETEC). Bacteria such as *Campylobacter*, *Salmonella*, *Shigella*, other *E. coli*, viruses (including norovirus and rotavirus), and protozoa (e.g. *Cryptosporidium* spp and *Giardia* spp), also cause travellers' diarrhoea. Cholera is rarely seen in travellers.

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Epidemiology

Global Epidemiology

Globally there are regional differences in the risk of diarrhoea [1]. Low risk countries include USA, Canada, Australia, New Zealand, Japan, and countries in northern and western Europe. Intermediate-risk countries include those in eastern Europe, South Africa, and some of the Caribbean islands. High-risk areas include most of Asia, the Middle East, Africa, Mexico, and Central and South America.

Diarrhoea caused by organisms such as norovirus, rotavirus, non-typhoid *Salmonella* spp, *Campylobacter* spp, *Giardia*, and *Cryptosporidium* are seen throughout the world including resource-rich countries in Europe, North America, and Australia and New Zealand. Other organisms, such as ETEC, *Shigella*, *Salmonella* Typhi and Paratyphi, and *Vibrio cholerae* serogroup O1, are more commonly associated with conditions of poor sanitation in resource-poor countries of Africa, Asia and Latin America.

It has been estimated that travellers' diarrhoea affects 20% to 60% of those who travel from resource-rich to resource-poor countries [2]. Approximately 9 million visits to resource-poor countries were made by UK residents in 2005 [3]. This indicates that as many as 5 million UK travellers may be affected each year. Efforts to determine the aetiology of travellers' diarrhoea in returning travellers encounter several difficulties. Many cases are mild and self-limiting and the patient may not go to the doctor to report it. Second, if the patient does visit their doctor, a sample may not always be obtained for laboratory confirmation. Third, if a sample is taken and analysed, it is not always possible to identify a causative organism. In fact, it has been estimated that in the UK, only 1 in 136 cases of gastrointestinal infection is reported to routine surveillance systems [4].

Epidemiology in UK Travellers

Figure 1: Laboratory reports of gastrointestinal illness by travel history, England, Wales, and Northern Ireland: 1995 – 2004 .

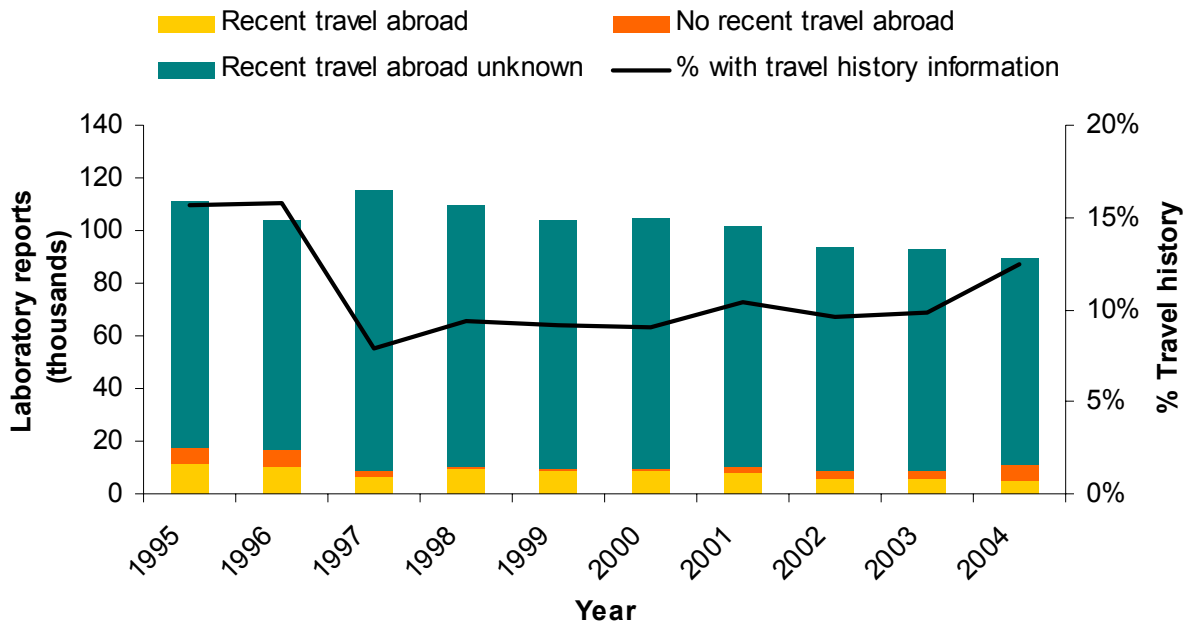


Figure 1 shows the total number of laboratory reports to the HPA Centre for Infections of organisms commonly causing gastrointestinal illness in England, Wales, and Northern Ireland from 1995 to 2004. Travel history reporting for gastrointestinal infections is incomplete; since 1997, on average, only 10% of reports had any travel history information. Enhanced surveillance of *Campylobacter* estimated that around 20% of the total reports for *Campylobacter* were associated with foreign travel, and that routine surveillance systems greatly underestimate this figure [5]. Between 1995 and 2004, on average, 7.6% of gastrointestinal infections were associated with travel abroad each year. However, because of under reporting, trends in travel-related infections should be interpreted with caution.

In 2004, there were 4,558 reports of gastrointestinal infections associated with travel abroad. Of these, 52% were due to *Salmonella* spp infection, 29% were due to *Campylobacter* spp, 7% to *Giardia lamblia*, 6% to *Shigella* spp, 2% to *Cryptosporidium*, and 4% were due to other organisms.

Although studies have shown that ETEC is the most frequent cause of TD [6], this is not evident from the data presented. It is difficult to attribute travellers' diarrhoea to ETEC, as *E. coli* are part of the normal bowel flora and specialised testing needs to be performed to distinguish toxigenic strains of *E. coli*. Furthermore, ETEC may cause less severe disease (in healthy adults). Therefore, most cases are not laboratory confirmed [7].

Table 1: Laboratory reports of the most commonly reported bacterial infections where there was known recent travel abroad, by region of travel, England, Wales, and Northern Ireland: 2004

Region of world	<i>Campylobacter</i>	<i>Salmonella</i>	<i>Shigella</i>
Europe	535	878	5
Indian sub-continent (ISC)	281	314	110
North Africa and the Middle East	175	405	81
South east Asia and far east	80	166	9
Sub-Saharan and southern	46	137	27

Africa			
Caribbean	18	93	12
South and Central America	44	38	9
More than one region	3	-	1
Other	29	50	4
Unspecified country	94	272	9
Total	1305	2353	267

Table 2: Laboratory reports of the most commonly reported protozoal infections where there was known recent travel abroad by region of travel, England, Wales, and Northern Ireland: 2004

Region of world	<i>Cryptosporidium</i>	<i>Giardia</i>	<i>Entamoeba</i>
Europe	35	33	1
Indian sub-continent	32	132	15
North Africa and the Middle East	17	34	4
South east Asia and far East	2	17	4
Sub-Saharan and southern Africa	6	45	17
Caribbean	11	6	1
South and central America	-	16	3
More than one region	1	7	2
Other	-	12	4
Unspecified country	7	19	3
Total	112	321	54

Tables 1 and 2 show the laboratory reports of bacterial and protozoal gastrointestinal illness in 2004 that specified recent travel abroad by world region of recent travel. Regions of travel varied by organism; the majority of *Campylobacter* spp, *Salmonella* spp, and *Cryptosporidium* spp were associated with travel to Europe, with Spain the most common country reported. For *Giardia lamblia* and *Shigella* spp, the most reported region of travel was the Indian sub-continent (ISC), with India and Pakistan being the most commonly reported countries. North Africa and the Middle East (in particular Egypt) were also commonly reported regions of travel for *Shigella* spp infections. *Entamoeba* spp were seen mainly in those travelling to sub-Saharan and southern Africa, and to the ISC.

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Risk for Travellers

Travellers' diarrhoea is the most common illness in those travelling from resource-rich to resource-poor countries and occurs in 20%-60% of travellers [2], with destination one of the most important determinants of risk [1]. The standard of hygiene in restaurants also contributes to diarrhoea risk [8, 9]. Those who travel rough, and are adventurous in their eating habits are likely to be at higher risk. The effects of diarrhoea are generally greater in the very young, the elderly, and those with special health needs.

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Transmission

Eating contaminated food and, to a lesser degree, drinking contaminated liquids are the predominant way of acquiring travellers' diarrhoea [10]. Although a change in bowel habit can be caused by stress, a change in diet, increased alcohol consumption, and hot weather; most episodes of diarrhoea are related to infection.

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Signs and Symptoms

Travellers' diarrhoea is usually defined as the passage of three or more unformed stools in a 24-hour period, or any number of loose stools if accompanied by abdominal pain, fever, nausea, or vomiting [2]. Travellers' diarrhoea typically occurs during the first week of arrival and is often self-limiting, lasting three to four days. Approximately 3% of travellers' diarrhoea persists for longer than a month. Some travellers will develop a post-infectious irritable bowel syndrome [11].

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Treatment

Generally, travellers' diarrhoea is a self-limiting illness lasting between one and several days.

Diet and Fluid. The most important aspect of management in all cases of diarrhoea is to maintain adequate hydration. Oral rehydration powders (e.g. Dioralyte® or Electrolade®) can be diluted into clean drinking water to remedy electrolyte imbalances and hydrate the traveller. Adults without underlying medical problems can rehydrate with available fluids or a salt and sugar solution of eight level teaspoons of sugar and ½ teaspoon of salt to a litre of clean water. Fluids are all that is required for most cases of diarrhoea that are mild and self-limiting. Dehydration in adults is unusual, but is the greatest risk for young children with diarrhoea [1]. The elderly and those with pre-existing illness are also more susceptible to complications. Breastfeeding should be continued for infants. As improvement occurs, bland foods, for example bread, cereals, potatoes, soup, rice, bananas, chicken, should be introduced as tolerated. Milk-containing products should be avoided for several days after recovery.

Loperamide. Loperamide may be considered for those travellers in whom frequent diarrhoea is inconvenient, e.g. those travelling on long bus journeys, or for business meetings. However, it should not be used if the traveller has active inflammatory bowel disease (e.g. ulcerative colitis), a fever or bloody diarrhoea [12]. Loperamide should be used with caution. It is licensed for children and adults age four years and older.

Antibiotics. Antibiotic treatment can be considered for treatment of moderate to severe travellers' diarrhoea. A Cochrane Review examined studies of the use of antibiotics for acute diarrhoea in travellers and determined that there were significant benefits from taking antibiotics [13]. Those who took antibiotics had a shorter duration of diarrhoea, decreased severity of illness, and were more frequently cured by 72 hours. Although there were more adverse effects in those being treated compared with those taking placebo, these were mostly minor or resolved once the antibiotic had been discontinued.

Fluoroquinolones are typically the drugs of choice [2]. Examples include ciprofloxacin 750mg as a single dose or 500mg twice daily for three days; or azithromycin 1,000mg single dose or 500mg once daily for three days. The combination of loperamide with an antibiotic in moderate travellers' diarrhoea may lead to more rapid clinical improvement compared with

either agent alone [2, 10]. *Campylobacter* is frequently resistant to fluoroquinolones [14, 15], and is a relatively higher risk for travellers to Southeast Asia and South Asia. In these cases as well as for other travellers, azithromycin is an appropriate choice.

Medical Care. Travellers should seek medical care if symptoms do not improve within a day or two, or they are passing blood and/or mucous and do not have prompt resolution. Medical care should be sought earlier for the elderly, and immediately for children whose diarrhoea is accompanied by dehydration, vomiting, fever or blood.

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Prevention

Following common sense guidelines on [food and water hygiene](#) [16] can help reduce the risk of travellers' diarrhoea.

The highest risk foods are those that have not been thoroughly cooked or that have been left out at room temperature. It is recommended that food is completely cooked and served piping hot, as most enteropathogens are inactivated at temperatures above 60°C. Precautions also need to be taken with drinking water by drinking only sealed bottled water, or water that has been purified by boiling or filtration combined with halogenation [17].

Antibiotic chemoprophylaxis is not recommended for most travellers. If a traveller is considering this, the risks and benefits of such a course should be thoroughly discussed.

Travellers should avoid excess alcohol and sample unfamiliar foods in moderation, as both of these can contribute to diarrhoea.

There is no vaccine available in the UK for the syndrome of travellers' diarrhoea. There are vaccines available for some faecal-orally transmitted organisms such as *Salmonella* Typhi, poliomyelitis, hepatitis A, and *Vibrio cholerae*.

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References

1. Centers for Disease Control and Prevention (CDC). Chapter 4; Travelers' diarrhea. Health Information for International Travel 2005-2006. Atlanta: CDC; 2006. Available at http://www2.ncid.cdc.gov/travel/yb/utills/ybGet.asp?section=dis&obj=travelers_diarrhea.htm&cssNav=browseoyb.
2. Al-Abri S, Beeching N, Nye F. Traveller's diarrhoea. *Lancet Infect Dis* 2005; 5 (6):349-60.
3. National Statistics. Travel Trends. A report on the 2005 International Passenger Survey. London: Palgrave Mcmillan. Available at http://www.statistics.gov.uk/downloads/theme_transport/traveltrends2005.pdf
4. Ericsson CD, DuPont HL. Travelers' diarrhoea: approaches to prevention and treatment. *Clin Infect Dis* 1993; 16: 616-24.
5. The *Campylobacter* Sentinel Surveillance Scheme Collaboration. Foreign and domestic travel and the risk of *Campylobacter* infection: results from a population-based sentinel surveillance scheme. *J Travel Med* 2003; 10: 136-8.
6. Brewster SJ, Taylor DN. Epidemiology of Travelers' Diarrhea. In Keystone JS, Kosarzky PE, Freedman DO et al. *Travel Medicine*. Mosby 2004. pp. 174-184.
7. Health Protection Agency (HPA). Foreign travel-associated illness; England, Wales, and Northern Ireland – Annual Report 2005. London: HPA; 2005. Available at <http://www.hpa.org.uk/publications/2005/travel/default.htm>.



8. Cartwright RY. Food and waterborne infections associated with package holidays. *J Appl Microbiol* 2003;94 Suppl:12S-24S;
9. Shlim DR. Looking for evidence that personal hygiene precautions prevent traveler's diarrhea. *Clin Infect Dis* 2005;41 Suppl 8:S531-5
10. Hill DR, Ericsson CD, Pearson RD, et al. The practice of travel medicine: Guidelines by the Infectious Diseases Society of America. *Clin Infect Dis* 2006;43:1499-1539
11. Stermer E, Lubezky A, Potasman I, Paster E, Lavy A. Is traveler's diarrhea a significant risk factor for the development of irritable bowel syndrome? A prospective study. *Clin Infect Dis* 2006;43:898-901
12. Which? What to do about travellers' diarrhoea. *Drugs and Therapeutics Bulletin*. 2002; 5:36-8.
13. De Bruyn G, Hahn S, Borwick A. Antibiotic treatment for travellers' diarrhoea. *Cochrane Database of Systemic Reviews* 2000; Issue 3; Art. No:CD002242. Available at:
http://www.mrw.interscience.wiley.com/cochrane/clsysrev/articles/CD002242/pdf_fs.html
14. Hoge CW, Gambel JM, Srijan A, Pitarangsi C, Echeverria P. Trends in antibiotic resistance among diarrheal pathogens isolated in Thailand over 15 years. *Clin Infect Dis* 1998;26:341-345
15. Gaunt PN, Piddock LJV. Ciprofloxacin resistant *Campylobacter* spp. in humans: an epidemiological and laboratory study. *J Antimicrob Chemother* 1996;37:747-757
16. NaTHNaC Health Information Sheet; Food and water hygiene. November 2006 [accessed 3 April 2007] Available at <http://www.nathnac.org/pro/factsheets/food.htm>.
17. World Health Organization. Preventing Travellers' Diarrhoea: How to Make Drinking Water Safe. Geneva: WHO; 2005. Available at:
http://www.who.int/water_sanitation_health/hygiene/envsan/sdwtravel.pdf.

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Reading List

Ericsson C, DuPont H, Steffen R. Travelers' Diarrhea. BC Decker 2003.

Heymann D, editor. Control of Communicable Diseases Manual. 18th ed. Washington DC: American Public Health Association 2004

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