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Abbreviations used in this report

AFRO	WHO African region
AIDS	Acquired Immune Deficiency Syndrome
CCDC	Consultant in Communicable Disease Control
Cfi	Centre for Infections
CFR	Case Fatality Rate
CI	Confidence Interval
CL	Cutaneous Leishmaniasis
CLASSP	Coordinated Local Authority Sentinel Surveillance of Pathogens
CDSC	Communicable Disease Surveillance Centre (Northern Ireland)
DALYs	Disability-Adjusted Life Years
DEET	N,N-diethyl-m-toluamide
DHSSPH	Department of Health, Social Services and Public Safety
EU15	European Union before accession countries entered in 2004
EU25	Current European Union
EURO	WHO European region
EWGLINET	European Surveillance Scheme for Travel Associated Legionnaires' Disease
FCO	Foreign and Commonwealth Office
GP	General Practitioner
GRASP	Gonococcal Resistance to Antimicrobials Surveillance Programme
GUM	GenitoUrinary Medicine
HIV	Human Immunodeficiency Virus
HSE	Healthy and Safety Executive
IgG	Immunoglobulin G
IgM	Immunoglobulin M
IHR	International Health Regulations

IPS	International Passenger Survey
ISC	Indian Sub-Continent
LACORS	Local Authorities Coordinators of Regulatory Services
LF	Lymphatic Filariasis
MRL	Malaria Reference Laboratory
MSM	Men who have sex with men
NaTHNaC	National Travel Health Network and Centre
NGO	Non-Governmental Organisation
NHS	National Health Service
NIS	Newly independent states of the former Soviet Union
NOIDS	Notifications of Infectious Diseases
ONS	Office of National Statistics
PCR	Polymerase Chain Reaction
RIDDOR	Reporting of Injuries, Diseases and Dangerous Occurrences Regulations
SARS	Severe Acute Respiratory Syndrome
SEARO	WHO South East Asia region
SPRU	Special Pathogens Reference Unit
STBRL	Sexually-Transmitted Bacterial Reference Laboratory
STI	Sexually-Transmitted Infection
TMHS	Travel and Migrant Health Section
UK	United Kingdom
UN	United Nations
VFR	Visiting Friends and Relatives
VL	Visceral Leishmaniasis
WHO	World Health Organization
WNV	West Nile Virus
WTO	World Tourism Organization

Executive summary

This is the biennial report of data on foreign travel-associated illness for 2004 and 2005 produced by the Travel and Migrant Health Section (TMHS) of the Health Protection Agency, Centre for Infections, a partner in the National Travel Health Network and Centre. The aim of this report is to give an overview of the global epidemiology of various travel-associated infections together with a summary of the burden of travel-associated diseases in England, Wales, and Northern Ireland. Each chapter links with relevant sources of information for travellers and their health advisers on pre-travel advice. This report follows on from the reports *Foreign travel-associated illness. England, Wales, and Northern Ireland: annual report 2005*¹ and *Illness in England, Wales and Northern Ireland associated with foreign travel – a baseline report to 2002*², to which reference is made.

Global travel trends showed a record increase in 2004, and in 2005, in recognition of the increasing facility with which disease can spread around the globe, the World Health Assembly agreed upon a new set of International Health Regulations which came into force in June 2007³.

In line with the international trend, travel abroad by United Kingdom (UK) residents continued to increase in 2004 and 2005. There were 66.4 million visits abroad made by UK residents in 2005, more than two thirds of which were to the European Union. Travel to more tropical destinations is also increasing rapidly however, and while holidays remain the most common reason for travel, trips to visit friends and relatives abroad are the second most important reason. Such trips are generally made by migrants to the UK, and in recognition of the strong overlap between travel and migration, the Travel Health Surveillance Section of the Centre for Infections expanded its remit in 2005 and changed its name to the Travel and Migrant Health Section. The section published its baseline report on migrant health in 2006⁴.

Gastro-intestinal infections remained the most reported travel-associated infectious hazard in 2005, though reports of *Salmonella* spp, *Campylobacter* spp, and hepatitis A associated with travel continue to decline. This is in part due to persistently poor capture of travel history in routine laboratory reports and so must be interpreted with caution. Cases of enteric fevers and malaria have, however, increased and for both of these diseases, those visiting friends and relatives are likely to be at highest risk. The largest proportion of malaria cases continues to be associated with failure to use chemoprophylaxis. One of the biggest challenges for travel medicine and public health professionals is to reach groups who may not perceive that their health is at risk from travel to countries familiar to them or their families, and who may therefore not seek medical advice when planning their trip.

While enhanced surveillance systems exist, or are being developed, for some travel-associated illnesses, the capture of travel history in routine surveillance remains poor. This further limits the usefulness of the data generated, which in any case, generally represents only the more severe end of the clinical spectrum of infections acquired abroad and therefore underestimates the true number of cases.

Furthermore, routine laboratory reporting does not collect the information required to determine which particular groups are at risk, nor which preventive measures may be most effective. In order to better understand the epidemiology of infectious disease acquired abroad and determine an appropriate public health response, it is essential that a high priority is given to capturing information on cases to include country of birth, country of likely acquisition of disease, reason for travel and type of trip, and preventive measures taken. This is likely to become increasingly important with ever changing global trends in travel and migration. The current development of NHS information systems represents an important opportunity to facilitate the robust provision of information by health professionals for adequate surveillance of infection acquired abroad.

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Summary of key points

- Although some infections have enhanced surveillance (eg malaria, Legionnaires' disease, Lyme disease, leptospirosis), travel history reporting through routine surveillance systems continues to be poor for some important travel-associated infections, such as typhoid, hepatitis A, and gastrointestinal infections, making trends difficult to interpret. Travel history reporting needs to be improved. Additionally, further epidemiological information (eg reason for travel, country of birth), is required to contribute to the evidence base for appropriately targeted pre-travel advice, and to distinguish between illness in short term travellers as opposed to migrants or foreign visitors to the UK.
- International travel has continued to increase with a record increase in 2004, with particular recovery in travel to South East Asia after the Severe Acute Respiratory Syndrome (SARS) epidemic. Travel abroad by United Kingdom (UK) residents followed the international trend and continued to increase in 2004 and 2005. More males than females travelled from the UK and were, on average, between 35 and 44 years of age. Around two-thirds of UK residents travelled for holidays, the majority to the European Union (EU). Since 2003, visits to tropical destinations increased by 28% compared to a decrease of 0.2% for visits to EU15. All other regions saw an overall increase except Sub-Saharan and Southern Africa. The number of visits made to see friends and relatives continued to increase at a higher rate (23% since 2003).
- On average, nearly 4,000 deaths of British nationals required consular action by the Foreign and Commonwealth Office (FCO) each year between 2001/02 and 2005/06. This is likely to be an underestimate of total deaths occurring abroad and does not distinguish between deaths in short term travellers and expatriates. Specific studies have shown that younger people tend to die from road traffic accidents while older people are more likely to die from illness resulting from pre-existing conditions. In terms of incidents abroad requiring consular assistance by the FCO, the majority were registered in Spain.
- There has been a general decline in gastrointestinal illness (GI) reported since 1997, GI is still, however, the most commonly reported travel-associated infection in England, Wales, and Northern Ireland. Around 4,500 laboratory reports of GI, where recent travel abroad was stated, were received by the Agency in 2005. *Salmonella* spp were the most commonly reported GI associated with recent travel abroad in England, Wales, and Northern Ireland; this is in contrast to the 1990s when *Campylobacter* spp were the most reported. Although some improvement has been made over the previous eight years, Labbase 2 underestimates travel-associated cases of GI (10% of reports had any information about travel); special studies or sentinel surveillance may show a truer impact of travel on GI. For *Salmonella* spp, *Campylobacter* spp, and *Cryptosporidium*, which are common worldwide, Europe was the most reported region of travel in 2004 and 2005, in particular travel to Spain and Greece; the Indian sub-continent came a close second. This reflects travelling patterns of UK residents. For *Shigella* spp, *Entamoeba* spp, and *Giardia*, the Indian sub-continent and Sub-Saharan and Southern Africa were the most commonly reported regions of travel.
- Since 2002, laboratory reports of *Salmonella* Typhi and *S. Paratyphi* have increased. Around two-thirds of *S. Typhi* and *S. Paratyphi* have any information about travel history and this has not changed significantly since the mid-1990s. Non-travel-associated *S. Typhi* and *S. Paratyphi* increased in 2004 and 2005. Of those reports of *S. Typhi* and *S. Paratyphi* A, where recent travel abroad was stated, the Indian sub-continent has been the most reported region of travel over recent years, with Sub-Saharan and Southern Africa also being an important region of travel for acquisition of paratyphoid A in 2004 and 2005, and South America being the most reported region of travel for paratyphoid B.

- In 2005, the number of reports and notifications of hepatitis A were the lowest seen since the 1990s. Only 6.5% of reports in 2005 had any information about travel history so it is probable that travel-associated hepatitis A is under reported. Where information on foreign travel was available, the Indian sub-continent (particularly India and Pakistan) was the most commonly reported region of travel.
- A clear rise in the number of cases of hepatitis E reported in England, Wales and Northern Ireland was apparent in 2005 with the onset of enhanced surveillance. Travel history through routine surveillance is under reported; enhanced surveillance and other studies suggest that those visiting friends and relatives in the Indian sub-continent are at a high risk of infection. Cases that have no travel history have different demographic characteristics and were infected with different genotypes of hepatitis E virus than those associated with travel abroad; a zoonotic route of infection has been suggested for non-travel-associated cases.
- Cases of cholera acquired abroad are reported in England and Wales in small numbers with no clear trends over time. The most common serotype reported in England and Wales is *Vibrio cholerae* O1 El Tor Ogawa. The most important region of acquisition is the Indian sub-continent.
- In England, Wales, and Northern Ireland, the most commonly reported intestinal helminths associated with travel abroad in 2005 were *Taenia* spp, *Trichuris* spp, and *Ascaris* spp. Travel history is very poorly recorded for these organisms through routine surveillance systems.
- Malaria is the most important arthropod borne infection reported in the UK. In total, 1,754 cases of malaria were reported in 2005, a 6% increase compared to 2004. Seventy-six percent of all malaria cases reported in 2005 was caused by *Plasmodium falciparum*, three-quarters of which were acquired in Sub-Saharan and Southern Africa, the majority in West Africa. Where information was available, over half of malaria cases reported had travelled to visit friends and relatives, the majority of them from ethnic minority groups. There were 11 deaths from malaria in 2005. Where information was available the majority of these deaths occurred in people who had taken no or inappropriate chemoprophylaxis. Only 53% of all malaria cases in 2005 had information about chemoprophylaxis taken; of those, 78% took no chemoprophylaxis.
- Between 2004 and 2005, there was a 13% rise in confirmed, probable, and suspected/possible cases of dengue fever reported in the UK. South East Asia, the Caribbean, and South and Central America are regions of the world where UK tourists are likely to contract dengue fever if they are not protected against mosquito bites.
- Chikungunya was rarely reported in travellers returning from endemic areas up to and including 2005.
- Leishmaniasis in England, Wales, and Northern Ireland has steadily increased between 1996 and 2005. The Middle East and South and Central America are important regions for acquisition of leishmaniasis. Military personnel may be at increased risk due to their deployment to endemic areas.
- Lyme borreliosis has continued to rise in recent years, with 658 reports of serologically diagnosed cases of *B. burgdorferi* infection in the UK. Most of this increase is in cases acquired in the UK. Increased numbers of infections have also been acquired abroad, in a variety of European countries and parts of the United States, and are particularly associated with outdoor activity holidays.
- Rickettsial diseases do not occur in the UK but small numbers are reported in England, Wales, and Northern Ireland each year. An increased number was reported in 2005. These infections are presumed to have been acquired abroad, though travel history information is lacking. Data from previous years have suggested that travel to South Africa in particular may be a risk factor for acquisition of rickettsial diseases.
- Trypanosomiasis is an extremely rare disease in travellers. Cases reported in the UK are usually acute African trypanosomiasis.
- West Nile virus is rarely reported in UK travellers but they should be made aware of the potential risk in endemic areas and take measures to protect themselves from mosquito bites.
- Filariasis is rare in UK travellers and reported cases have been decreasing since 2002. Data on travel history are lacking and it is not possible to tell from the data available if short-term travellers to endemic countries are at equal risk from filariasis as migrants from endemic areas.

- Of all individuals newly diagnosed with HIV infection in England and Wales between 2001 and 2005, who acquired their infection through sexual contact and for whom country of infection was reported, 74% probably acquired their infection abroad. This proportion varies by sexual orientation and country of birth. Of all UK-born heterosexuals who were infected with HIV abroad, 43% were probably infected in an African country and 29% in Thailand.
- Of all reference laboratory-confirmed cases of gonorrhoea reported to the gonococcal resistance to antimicrobials surveillance programme, 12% probably acquired their infection abroad and region of infection is dependent on sexual orientation.
- The majority (90%) of syphilis cases reported in England and Wales are acquired in the United Kingdom. There is limited information available about syphilis acquired abroad. Of the small numbers that are probably acquired abroad, however, the majority are reported from London and North West England.
- Measles, mumps, and rubella are prevalent to varying degrees throughout the world depending on vaccine coverage. Every year a small number of cases are reported in England and Wales that have been acquired in countries where vaccine coverage is low.
- Diphtheria acquired abroad is rarely reported in the UK, the last two cases reported in England and Wales were in 2003 and were acquired in Asia.
- Polio has been eradicated in most countries of the world. The last reported case in the UK was in 1993 associated with travel to India.
- In general, just under half of all Legionnaires' disease cases reported in England, Wales, and Northern Ireland are acquired abroad. The number of cases reported in the UK and in the rest of Europe that were acquired abroad has increased steadily over recent years, with 2004 seeing the highest number reported in England, Wales, and Northern Ireland since 1996. In 2004 and 2005, Europe was the most reported region of acquisition for Legionnaires' disease acquired abroad in England, Wales, and Northern Ireland.
- Between 1996 and 2005, reports of schistosomiasis in England, Wales, and Northern Ireland have declined. The most important region of acquisition for schistosomiasis continues to be Sub-Saharan and Southern Africa.
- There was an overall increase during the period 1997 to 2005 in the number of patients with leptospirosis acquired during travel to both tropical and European countries compared to 1992 to 1996. This may be associated with the worldwide increase in travel, and adventure holidays in particular. Cases are acquired abroad each year especially in travellers to South East Asia and Australasia in whom the serovars encountered may differ from those found in the UK. These are most likely to occur in travellers who have participated in recreational watersports activities.
- Travel-associated rabies is rarely seen in the UK, but cases have occasionally occurred. The disease (and death) occurs in people who have failed to receive appropriate pre- or post-exposure prophylaxis.

Sources of data and their limitations

International perspective

Each disease chapter begins with a brief summary and update of the global epidemiology of the infection up to and including 2005. This information is usually obtained from the World Health Organization (WHO) fact sheets¹ or other WHO publications as well as from other national surveillance centres and peer-reviewed literature.

Information on international outbreaks depends on good surveillance systems within the affected country, a good communication network, and reliable reporting and/or media coverage. Outbreak information that is available is therefore biased towards those countries with robust health and reporting systems and will not be representative of the global situation in terms of the epidemiology of a disease. Furthermore, many outbreaks of infectious diseases reported abroad are not necessarily relevant to the UK traveller. Therefore for this report, international outbreaks will not be summarised in the disease chapters. Those wishing to know more information about international outbreaks can refer to either the World Health Organization Disease Outbreak News page² or the National Travel Health Network and Centre website³, which will shortly be making available their international outbreak database (searchable by disease and country). Outbreaks are also reported on the ProMED website⁴.

Mortality data

Data on deaths occurring abroad in 2004 and 2005 were obtained from the Foreign and Commonwealth Office. The data refer to deaths that required action by consular staff; more information about this is available in the *Mortality and non-infectious morbidity in travellers* chapter. The data are unlikely to represent the entirety of deaths that occur abroad, nor is information on cause of death currently available. It is also not possible to distinguish between deaths that occurred in expatriates as opposed to deaths in shorter term travellers.

Data on non-infectious travel-associated morbidity

Data was not routinely available on non-infectious hazards in travellers in 2004 and 2005 although some limited information was available from the Foreign and Commonwealth Office.

Data on travel-associated infections

Where possible, data are presented for England, Wales, and Northern Ireland. In some cases data may only be available for England and Wales or, as in the case for malaria and dengue fever, data may be presented for the whole of the United Kingdom.

NOIDS

Statutory Notifications of Infectious Diseases (NOIDS) are collated by the Information and Knowledge Management Department at the Centre for Infections. The advantages and limitations of these data are outlined in *Illness in England, Wales, and Northern Ireland – a baseline report to 2002*⁵. In most cases NOIDS are used as an illustration of historical disease trends rather than analysis of actual disease numbers.

Laboratory reports

The laboratory reporting system is a voluntary system into which up to 400 NHS source laboratories report. Each laboratory has its own laboratory information management system where the data are entered; the data are then extracted electronically by Co-Surv and collated centrally via Labbase 2. Information available via this system regarding whether an infection may be acquired abroad is very variable, and the data it generates therefore need to be interpreted with caution. In particular it must be noted that travel history is poorly captured and reason for travel and country of birth are not routinely collected. This means that it is generally not possible to distinguish between disease in UK travellers and new entrants to the UK; nor is it possible to determine which groups of UK travellers going to which countries may be most at risk. More information on the advantages and limitations of this system is available in the baseline report⁵.

Supplementary information and other routine surveillance systems

Enhanced surveillance or specific studies may be conducted for some infections, which can provide supplementary information about travel history as well as a more accurate ascertainment of cases of a particular infection. In these cases, information has been provided by the relevant department that has conducted the study and/or enhanced surveillance. Infections for which this is the case are listed below. Specific information on the sources of data is detailed within the relevant chapter.

- Cholera
- Malaria
- Dengue fever
- Leishmaniasis
- Lyme disease
- Leptospirosis
- HIV and STIs
- Legionnaires' disease
- Measles, mumps, and rubella

Denominator data

The Office of National Statistics (ONS) collects information on how many visits abroad are made by UK residents, using the annual International Passenger Survey (IPS). This has been used to provide data on how and where UK residents travel but has not generally been used as a denominator to calculate rates of disease in travellers. This is for two main reasons. Firstly, the numerator data are not sufficiently robust in most cases for rates to give an accurate picture of disease in travellers to a particular country. Secondly, the IPS is a survey based on 250,000 travellers conducted primarily for economic reasons, and some less frequently visited countries, eg in Sub-Saharan Africa, which may be very important in terms of travel-associated infections, may be under-represented in this survey. It is hoped that when more robust travel history becomes available (eg in the enhanced surveillance of typhoid and paratyphoid that began in May 2006), that rates and relative risks of acquiring disease in different countries can be calculated.

Analyses

Analysis in this report is descriptive and is limited in most cases to crude numbers of cases reported in England, Wales, and Northern Ireland, where available. Countries of travel were classified using the classifications in the UK 'yellow book', *Health information for overseas travel*⁶. Further information on how the data are analysed is detailed in the baseline report⁵.

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