

Health Protection Report

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Foreign travel-associated illness – a focus on those visiting friends and relatives

A new travel health report, released by the Agency on 9 January, focuses on infectious diseases acquired by those travelling abroad to their country of origin (or that of their family) to visit friends or relatives (VFR)[1]. The report summarises trends in the latest available data related to VFR travel from the Office for National Statistics International Passenger Survey, together with the latest surveillance data available for malaria, enteric fever, and hepatitis A, three important infections associated with VFR travel.

People travel abroad for many reasons and the reason why they travel affects where they go, and therefore their risk of acquiring an infectious disease. In recent years, the number of visits abroad made by United Kingdom residents to visit friends and relatives (VFR) has increased by 67%, compared to 35% for holiday travel and 13% for business travel. VFR travel is now the second most common reason for travelling abroad in the UK and often involves travel to regions that have a higher risk of certain diseases such as malaria, enteric fever (typhoid and paratyphoid), and hepatitis A. A disproportionate number of people who have acquired malaria and enteric fever through foreign travel are those who have undertaken VFR travel (87% for enteric fever and 78% for malaria), though slightly different population groups are affected in each case.

Malaria predominantly affects those who were either born in Africa or are of African ethnicity who have undertaken VFR travel to West Africa, while enteric fever predominantly affects those who were either born in the Indian subcontinent (mainly India, Pakistan, and Bangladesh) or are of Indian subcontinent ethnicity who have undertaken VFR travel to the Indian subcontinent. While there is less information about hepatitis A, studies have shown that for travel-associated cases, travelling to the Indian subcontinent to visit friends and relatives is a significant risk factor.

Contributing factors for the disproportionate burden of typhoid, paratyphoid, and malaria in those travelling for VFR reasons were not seeking travel advice before their trip, and not using adequate prevention measures. VFR cases of enteric fever were less likely to have sought health advice before travel than non-VFR cases, particularly those who were non-UK born. The vast majority of malaria cases associated with VFR travel had not taken any chemoprophylaxis recommended by the HPA Advisory Committee for Malaria Prevention in UK Travellers [2].

Travel-associated illnesses do not generally pose a significant risk of onward transmission to the indigenous UK population. They can be very serious for those travellers affected, however, and to reduce the overall number of such illnesses reported in the UK, particular attention needs to be given to protecting the health of VFR travellers. Travellers visiting friends and relatives in countries with endemic infectious diseases need to be made aware of possible risks to their health. They should ideally seek travel health advice from their GP or a travel clinic at least six weeks before their trip, although it is never too late to seek advice before departure.

The report is available to download from the [National Infectious Diseases Reports](#) section (within the Publications pages) of the Agency website. Hard copies will be available in February 2009 from tmhs@hpa.org.uk.

Advice on all aspects of pre-travel health is available from the National Travel Health Network and Centre at <http://www.nathnac.org/>.

The most up to date surveillance data for travel-associated diseases is available on the [Travel Health page](#) of the HPA website.

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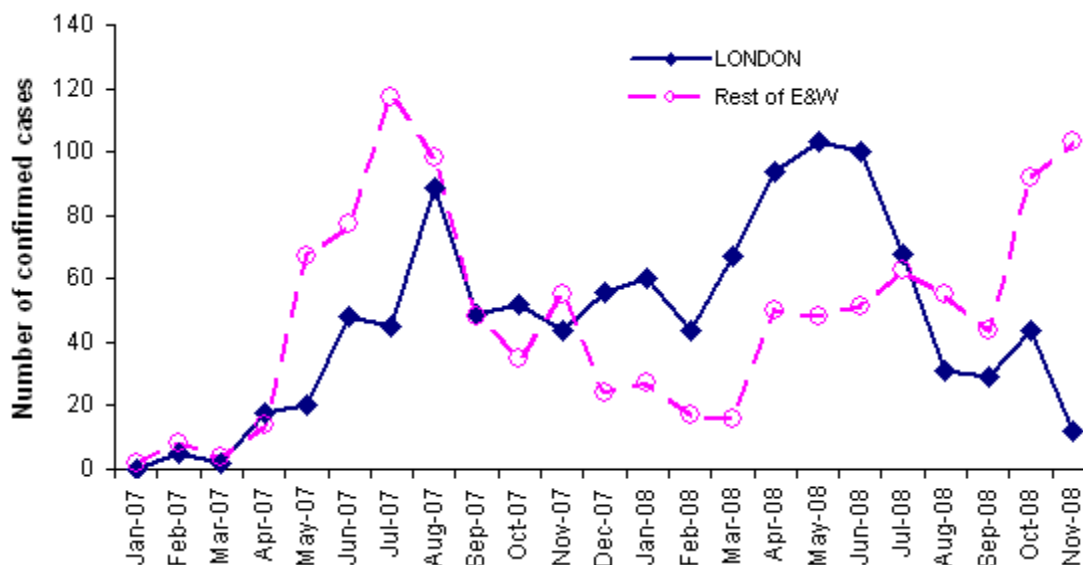
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Confirmed measles cases in England and Wales – an update to end-November 2008

In November 2008, 115 cases of measles were confirmed in England and Wales (see figure 1), an increase on each of the previous two months (83 and 72 respectively). This increase was attributable to cases outside of London: the number of cases in London was the lowest monthly total this year [1].

A provisional total of 1,217 laboratory confirmed measles cases have been reported in 2008 up to the end of November, exceeding the total of 990 reported for the whole of 2007. The proportion of measles notifications confirmed by a positive oral fluid test was 21% in London and 27% in the rest of England and Wales.

Figure 1: Number of laboratory confirmed cases in England and Wales by month of onset: January 2007 to November 2008

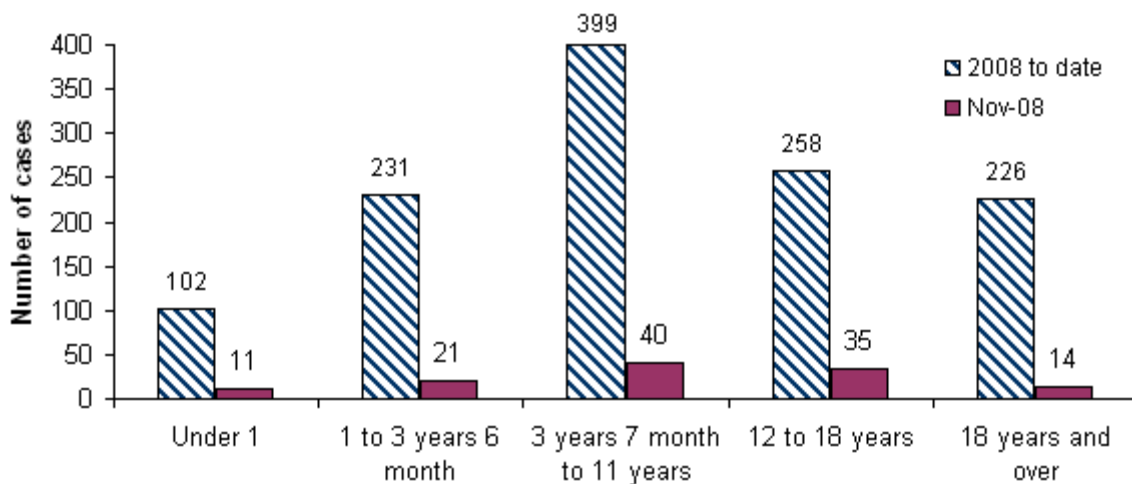


The majority of the November cases (74%) were concentrated in the North West, South East and West Midlands regions (see table). These regions continued to identify cases linked with outbreaks in nurseries, and in primary and secondary schools. In West Midlands and South East regions cases were also linked to outbreaks in traveller communities. In addition, a nosocomial outbreak was identified when a healthcare worker became infected after attending a child with measles.

Confirmed cases of measles by region and month of onset, England and Wales: January 2008 to November 2008

Month	Lond-on	East Mids	East of Engl'd	North East	North West	South East	South West	West Mids	Wales	York. & Humber
Jan	60	1	8	1	1	1	–	3	1	11
Feb	44	–	4	3	–	7	–	–	–	3
Mar	67	1	1	–	–	6	1	1	1	5
Apr	94	–	8	3	1	6	15	2	–	15
May	103	1	6	–	23	4	7	3	–	4
Jun	100	–	10	1	22	7	3	5	–	3
Jul	68	1	10	–	22	17	3	8	–	2
Aug	31	8	8	–	14	17	–	6	–	2
Sep	29	3	3	–	7	2	–	9	20	–
Oct	44	13	5	2	35	10	1	10	14	1
Nov	12	7	10	2	27	24	1	30	1	1
Total	652	35	73	12	152	101	31	77	37	47

Figure 2: Confirmed cases by age groups targeted by the MMR catch-up programme, England and Wales: January 2008 to November 2008*



* Includes one case with unknown age.

Sixty-five percent of cases reported to November 2008 have been children less than 15 years of age: 1 to 4 years (301 cases), 5 to 9 (274 cases) and 10 to 14 (222 cases). Local MMR catch-up campaigns targeting children and youngsters up to the age of 18 years are ongoing in many areas [2, 3].

Both strains of the D4 genotype (MVs/Enfield/14.07 and MVs/Chester/38.08) are continuing to circulate in different parts of England and Wales.

An article published in *The Lancet* this week suggests that, due to suboptimum vaccination coverage in some countries, there is a real possibility that the European region may fail to meet the measles elimination goal set by the World Health Organization (WHO) [4]. The paper examines epidemiological data submitted by 32 countries in Europe to EUVAC.NET (a European surveillance network for vaccine preventable diseases) for 2006 and 2007. Over 12 thousand measles cases were reported, most of which (85%) were in Romania, Germany, Switzerland, Italy and UK.

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Intestinal helminths								
<i>Strongyloides</i> spp	–	12	1	5	2	25	2	17
Hookworm	2	16	1	8	10	32	3	16
<i>Ascaris</i> spp (round worm)	2	18	2	22	4	42	7	45
<i>Trichuris</i> spp (whip worm)	3	15	1	7	6	26	2	14
<i>Hymenolepis</i> spp	2	7	–	–	2	7	1	3
<i>Taenia</i> spp (tape worm)	2	28	4	18	6	69	14	71
<i>Gnathostoma</i> spp	–	–	–	–	–	–	–	1
<i>Diphyllobothrium latum</i> (fish tape worm)	–	–	1	1	1	3	1	1
Arthropod-borne infections								
Malaria - total †	495	495	499	499	1036	1036	1123	1123
<i>Plasmodium falciparum</i>	390	390	367	367	824	824	809	809
<i>Pl. vivax</i>	79	79	93	93	141	141	201	201
<i>Pl. malariae</i>	5	5	9	9	12	12	22	22
<i>Pl. ovale</i>	18	18	27	27	53	53	80	80
<i>Pl. unspesified</i>	–	–	–	–	–	–	–	–
Mixed	3	3	3	3	6	6	11	11
Arboviruses								
Dengue virus ††	43	57	42	52	82	106	78	98
Chikungunya virus ††	2	2	8	11	7	8	19	25
Ross river virus ††	–	–	–	–	–	–	–	–
Sandfly fever virus ††	7	8	–	–	9	10	1	1
Eastern Equine Encephalitis ††	–	–	1	1	–	–	1	1
West Nile virus ††	–	–	–	–	–	–	–	–
Unspecified	29	31	19	22	72	82	60	66
Leishmaniases								
Cutaneous	8	8	3	5	19	19	11	13
Visceral	3	6	3	3	11	15	9	12
Unspecified	–	4	1	7	–	9	5	12
Filariases								
<i>Loa loa</i>	–	–	–	1	–	1	–	1
<i>Wuchereria bancrofti</i>	–	–	–	–	–	–	–	–
<i>Mansonella perstans</i>	–	–	1	1	1	1	1	1
<i>Onchocerca volvulus</i>	–	–	–	–	–	–	–	–
Unspecified	1	1	–	–	1	1	–	–
Trypanosomiasis								
	1	1	1	2	1	1	2	3

Sub-total	69	40	61	37	37	30	65	-	339
Other (N=42)	10	16	6	5	9	3	25	13	87
Country not stated	12	22	5	19	11	10	20	4	103
Total	91	78	72	61	57	43	110	17	529

There were over 80 other *Salmonella* serovars reported during the third quarter, those with the highest numbers included *S. Typhimurium* (109/1044, 10%), *S. Kentucky* (43/1044, 4%), *S. Virchow* (42, 4%), *S. Infantis* (21/1044, 2%), *S. Stanley* (20, 2%), and *S. Newport* (20, 2%). Both *S. Kentucky* and *S. Virchow* were mainly associated with travel to North Africa and the Middle East (33 and 22 respectively) and *S. Stanley* was mainly associated with travel to Thailand (seven) and Pakistan (six).

***Campylobacter* spp**

There were 15,989 laboratory reports of *Campylobacter* spp, of which 366 (2%) were associated with recent travel abroad. Countries of travel associated with travel-associated *Campylobacter* spp, tend to reflect travel patterns of UK residents [table 3].

Table 3. Laboratory reports of *Campylobacter* spp associated with foreign travel, England and Wales: third quarter 2008.

Country of travel	Total
Spain	77
Turkey	46
Portugal	24
India	22
Morocco	18
France	17
Thailand	12
Pakistan	10
Tunisia	8
Poland	7
Greece	6
Egypt	6
Cyprus	6
Indonesia	5
Kenya	4
Sub-total	268
Other (N=45)	77
Country not stated	21
Total	366

***Shigella* spp**

In total, there 454 reports of shigella infection in the third quarter of 2008, of which 67 (15%) were associated with foreign travel. Travel history information was available for 58% of both *S. boydii* and *S. dysenteriae* reports, but for only 23% for *S. sonnei* and *S. flexneri*. Countries of travel are listed for each species in table 4.

Table 4. Laboratory reports of *Shigella* spp associated with foreign travel, England and Wales: third quarter 2008

Country of travel	<i>Shigella</i> species					Total
	<i>S. flexneri</i>	<i>S. sonnei</i>	<i>S. sp</i>	<i>S. boydii</i>	<i>S. dysenteriae</i>	
Egypt	–	14	1	2	–	17
Pakistan	4	–	–	2	1	7
India	1	3	–	3	2	9
Morocco	–	4	–	2	–	6
Mexico	1	2	–	–	–	3
Spain	1	–	1	–	–	2
Portugal	–	2	–	–	–	2
Tunisia	–	2	–	–	–	2
Greece	–	2	–	–	–	2
Kenya	1	–	–	1	–	2
Africa unspecified	1	–	–	–	1	2
Cape Verde	–	–	–	2	–	2
Sub-total	9	29	2	12	4	56
Other countries	2	3	1	1	2	9
Country not stated	1	–	–	1	–	2
Total	12	32	3	14	6	67

Cholera

There were eight reports of *Vibrio cholerae* serogroup O1, compared to five reported in the same period in 2007; countries of travel reported were Pakistan (three), India (two), Egypt (one), Asia unspecified (one), and one had no country of travel stated.

Cryptosporidium

During the third quarter, there were 1,530 reports of *Cryptosporidium* (via Co-Surv) of which, 85 reports (6%) stated recent travel abroad. Countries of travel reported are listed in table 5.

Table 5 . Laboratory reports of *Cryptosporidium* spp associated with foreign travel, England and Wales: third quarter 2008.

Country of travel	Laboratory reports
Turkey	17
Spain	14
Pakistan	9
India	6
Tunisia	5
Egypt	5
United States	2
Bangladesh	2
Subtotal	60
Other countries (N=18)	18
Country not stated	7
Total	85

Sentinel surveillance submission forms to the UK Cryptosporidium Reference Unit (CRU) during the same time frame included 117 (21% of the total) travel abroad-related cases. [Rachel Chalmers, Head of UK Cryptosporidium Reference Unit, NPHS Wales, personal communication, 1 December 2008.] Travel-related cases were identified as 99 *Cryptosporidium hominis*, of which 20 travelled to Turkey, 19 to Spain, 12 to Pakistan, 11 to Majorca, five to Mexico, four to India, four to Egypt, and the remaining 22 to 15 other countries worldwide, and two had no country stated. There were 13 cases identified with *C. parvum*; 10 travelled to different countries and three had no country stated. Two cases with *C. meleagridis* travelled to Borneo and India; one case that had travelled to Afghanistan had a dual infection and two were not typed.

Giardia lamblia

There were 1009 giardia infections reported, of which 75 (7.4%) were associated with recent travel abroad. Most commonly reported countries of travel were India (19 reports), Pakistan (six), Egypt (five), Spain (four), and Indonesia (three); 34 cases reported travel from 31 other countries worldwide and four had no country stated.

Other intestinal protozoa

There were 1009 giardia infections reported, of which 75 (7.4%) were associated with recent travel abroad. Most commonly reported countries of travel were India (19 reports), Pakistan (six), Egypt (five), Spain (four), and Indonesia (three); 34 cases reported travel from 31 other countries worldwide and four had no country stated.

Enteric fever

During the third quarter of 2008, there were 69 reports of *S. Typhi* and 67 reports of *S. Paratyphi* (59 *S. Paratyphi* A and eight *S. Paratyphi* B).

Fifty-two percent (36/69) of *S. Typhi* and 64% of *S. Paratyphi* (43/67) reports were associated with recent travel abroad. Countries of travel are listed in table 6. The Indian sub-continent remains the most reported region of travel for cases of enteric fever and is mainly associated with those visiting friends and relatives in their country of ethnic origin [3].

Table 6. Laboratory reports of enteric fever associated with foreign travel, England and Wales: third quarter 2008

Country of travel	<i>Salmonella</i> spp			Total
	<i>S. Typhi</i>	<i>S. Paratyphi</i> A	<i>S. Paratyphi</i> B	
Pakistan	13	19	1	33
India	9	15	–	24
Bangladesh	5	2	–	7
Iraq	2	–	–	2
Nigeria	2	–	–	2
Africa unspecified	1	–	–	1
Brazil	–	1	–	1
Ghana	1	–	–	1
Nepal	–	1	–	1
Sierra Leone	1	–	–	1
Sri Lanka	–	1	–	1
Turkey	–	–	1	1
Country not stated	2	1	1	4
Total	36	40	3	79

Intestinal helminths

In the third quarter of 2008, there were 98 reports of intestinal helminth infection, of which 10 were associated with recent foreign travel [table 7]. Helminth infections can persist in the body for months and it may not be possible to say for certain where these infections were acquired; they are probably associated with new entrants and visitors to the UK as well as short-term travellers.

Table 7. Intestinal helminths associated with recent foreign travel, England and Wales: third quarter 2008

Organism	Country of travel
<i>Ascaris lumbricoides</i>	Nigeria (1), Morocco (1)
<i>Hookworm</i> sp	Congo (1), Guyana (1)
<i>Hymenolepis nana</i>	Afghanistan (1), Not stated (1)
<i>Taenia saginata</i>	Ethiopia (1)
<i>Trichuris trichiura</i>	Nigeria (1), Not stated (2)

Arthropod-borne infections

Malaria

During the third quarter of 2008, there were 495 cases of malaria reported in the United Kingdom, 79% (390 cases) of which were caused by the parasite, *Plasmodium falciparum* and 16% (79 cases) were caused by *P. vivax*. Where country of travel was known, 87% (276/317) of malaria cases caused by *P. falciparum* were reported to be acquired in West Africa, and 92% (58/63) of *P. vivax* cases were reported to be acquired in the Indian subcontinent.

Dengue

Fifty-seven cases (includes 10 confirmed, 44 probable, and three suspected) were reported by the HPA Special Pathogens Reference Unit (SPRU) in the third quarter. Of those, 43 had information about country of travel. The majority of cases reported recent travel to Asia or South America. Countries of travel reported included Thailand (16), Bangladesh (six), India (four), Viet Nam, Cambodia, Australia, Trinidad (two each), and 16 other countries throughout Asia, South and Central America, and Africa.

Chikungunya

There were two cases (one probable, one suspected) of chikungunya infection reported by the SPRU; countries of travel were India and Ghana.

Sandfly fever virus

There were eight reports of sandfly fever virus infection in the third quarter, of which three were confirmed and five were suspected; all three confirmed cases had travelled to Afghanistan .

Leishmaniasis

There were 18 cases of leishmaniasis reported in the third quarter, eight of which were presumed to be cutaneous leishmaniasis with travel to Belize (five), Mexico (two), Pakistan (one), Ecuador (one), Guyana (one) [some travelled to more than one country]. There were six presumed visceral leishmaniasis with recent travel to Cyprus (one), the Mediterranean (one), and Namibia; three had no country stated. There were four further reports of leishmaniasis of unspecified type, also with no travel history.

Trypanosomiasis

There was one case of African trypanosomiasis caused by *Trypanosoma brucei* ; the case had travelled to Tanzania.

Other infections

Schistosomiasis

There were 13 reports of infection with *Schistosoma* spp, eight *S. haematobium* and four *S. mansoni*. One *S. haematobium* report had information about travel and had travelled from Sudan.

Rickettsial infections

There were 27 cases of *Rickettsia* spotted fever (seven confirmed, 10 probable, 10 suspected) reported by the SPRU in the third quarter. Four cases had reported travel to South Africa, two to Thailand, and one to each of India, Afghanistan, Uganda, United States, Canada, Egypt, Zanzibar, Zimbabwe, Tunisia, Madeira; one case travelled to Thailand, Myanmar, and Malaysia. There were two confirmed cases and one suspected case of epidemic typhus, of which one had been to Afghanistan and one to the Far East.

Legionnaires' disease

There were 149 cases of Legionnaires' disease reported in the third quarter, of which 44 (30%) were associated with travel abroad (a decrease compared to 38% in 2007). Four of the travel-associated cases died. Most cases are sporadic but eight of the travel-associated cases were possibly involved in six different travel-associated outbreaks occurring Malta, Spain, Cyprus, Italy, Germany, and Egypt.

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Respiratory

Laboratory reports of respiratory infections made to Cfl from HPA and NHS laboratories in England and Wales: weeks 49/2008 to 01/2009

Data are recorded by week of report, but include only specimens taken in the last eight weeks (ie recent specimens).

Table 1 Reports of influenza infection made to Cfl, by week of report: weeks 49/2008 to 01/2009

Week	Week 49	Week 50	Week 51	Week 52	Week 01	Total
Week ending	07/12/08	14/12/08	21/12/08	28/12/08	04/01/09	
Influenza A	64	115	132	153	210	674
Isolation	6	46	10	20	41	123
*DIF	19	21	43	57	30	170
Four-fold rise in paired sera	–	–	–	–	–	–
PCR	35	42	78	68	129	352
†Other	4	6	1	8	10	29
Influenza B	2	2	5	13	1	23
Isolation	–	2	–	–	–	2
*DIF	1	–	–	2	–	3
Four-fold rise in paired sera	–	–	–	–	–	–
PCR	–	–	2	8	1	11
†Other	1	–	3	3	–	7
Influenza (untyped)	–	–	–	–	–	–
Isolation	–	–	–	–	–	–
*DIF	–	–	–	–	–	–
Four-fold rise in paired sera	–	–	–	–	–	–
PCR	–	–	–	–	–	–
†Other	–	–	–	–	–	–

*DIF = Direct Immunofluorescence.

† 'Other' = 'Antibody detection - Single high titre' or 'method not specified'

Table 2 Respiratory viral detections by any method (culture, direct immunofluorescence, PCR, four-fold rise in paired sera, single high serology titre, genomic, electron microscopy, other method, other method unknown), by week of report: weeks 49/2008 to 01/2009

Week	Week 49	Week 50	Week 51	Week 52	Week 01	Total
Week ending	07/12/08	14/12/08	21/12/08	28/12/08	04/01/09	
Adenovirus [*]	33	26	36	24	25	144
Coronavirus	–	8	5	10	1	24
Parainfluenza [†]	11	20	8	16	27	82
Rhinovirus	41	58	19	78	44	240
Respiratory Syncytial Virus (RSV)	618	533	459	437	418	2465

* Respiratory samples only. Excludes diagnoses made by electron microscopy (EM)

† Includes parainfluenza types 1, 2, 3, 4 and untyped.

Table 3 Respiratory viral detections by age group: weeks 49/2008 to 01/2009

Age group (years)	<1 year	1-4 years	5-14 years	15-44 years	45-64 years	≥65 years	Unknown	Total
Adenovirus [*]	56	39	9	23	13	4	–	144
Coronavirus	9	9	–	3	2	1	–	24
Influenza A	145	138	68	160	83	77	3	674
Influenza B	1	1	–	11	6	4	–	23
Parainfluenza [†]	31	22	7	8	9	5	–	82
Rhinovirus	133	46	21	13	23	2	2	240
Respiratory syncytial virus (RSV)	1996	296	31	35	60	42	5	2465

* Respiratory samples only.

† Includes parainfluenza types 1, 2, 3, 4 and untyped.

Table 4 Laboratory reports of infections associated with atypical pneumonia, by week of report: weeks 49/2008 to 01/2009

Week	Week 49	Week 50	Week 51	Week 52	Week 01	Total
Week ending	07/12/08	14/12/08	21/12/08	28/12/08	04/01/09	
<i>Coxiella burnettii</i>	1	–	–	–	2	3
Respiratory <i>Chlamydia</i> sp.	5	2	2	3	–	12
<i>Mycoplasma pneumoniae</i>	11	14	4	13	9	51
Legionella sp.	9	3	1	3	3	19

* Includes *Chlamydia psittaci*, *Chlamydia pneumoniae*, and *Chlamydia* sp detected from blood, serum, and respiratory specimens.

Table 5a Reports of Legionnaires' Disease cases in England and Wales, by week of report: weeks 49/2008 to 01/2009

Week	Week 49	Week 50	Week 51	Week 52	Week 01	Total
Week ending	07/12/08	14/12/08	21/12/08	28/12/08	04/01/09	
Nosocomial	–	–	1	–	–	1
Community	5	3	–	–	3	11
Travel Abroad	2	–	–	3	–	5
Travel UK	2	–	–	–	–	2
Total	9	3	1	3	3	19
Male	6	3	1	3	2	15
Female	3	–	–	–	1	4

(*) Non-pneumonic case(s)

Nineteen cases were reported with pneumonia; 15 males aged 46-81 years and four females aged 36-63 years. Eleven cases had community acquired infection. Three deaths were reported in males aged 60-77 years.

Seven cases were travel-associated: India (1), Italy (1), Spain (1), Taiwan (1), United Kingdom (2) and United States of America (1).

Table 5b Reports of Legionnaires' disease cases by region of report in England and Wales: weeks 49/2008 to 01/2009

Region/country	Nosocomial	Community	Travel abroad	Travel UK	Total
North East	1	–	–	–	1
Yorkshire & Humber	–	1	1	–	2
East Midlands	–	1	–	–	1
East of England	–	1	–	–	1
London	–	2	1	–	3
South East	–	3	1	–	4
South West	–	–	–	1	1
West Midlands	–	2	1	1	4
North West	–	1	1	–	2
Wales	–	–	–	–	–
Unknown	–	–	–	–	–
Total	1	11	5	2	19

(*) Non-pneumonic case(s)

Radiation

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Mortality and cancer risks in radiation workers

The most precise estimates to date of the cancer risks associated with long-term, low-level exposure to ionising radiation have been published by the Agency's Radiation Protection Division [1] based on an epidemiological study of radiation workers in the UK.

The estimates are the result of work started in 1976 by the then National Radiological Protection Board (NRPB) aimed at providing reliable information on the health of people working with ionising radiation. The National Registry for Radiation Workers (NRRW) was established at that time to facilitate this. It now comprises more than 175,000 radiation workers and covers virtually of all of the main organisations involved in the UK nuclear and related research and industrial sectors. One of the conclusions of the new report is that overall mortality among these workers is lower than that in the general population (a "healthy worker effect").

Estimates of the long-term health risks from ionising radiation are based largely on epidemiological studies of the survivors of the atomic bombings in Japan and of groups exposed for medical reasons, many of whom received high doses acutely. Establishment of the NRRW has aided research into the risks from protracted or low-dose radiation exposures.

Two earlier analyses of mortality in the NRRW [2, 3] found some evidence of an association between workers' radiation dose and leukaemia, after excluding chronic lymphatic leukaemia (CLL) which does not appear to be radiation-inducible. However, the estimates of radiation risks derived from these analyses and from a study of nuclear workers in 15 countries, for which NRRW formed the UK component, were imprecise. To obtain more precise information on the risks of occupational radiation exposure, a third analysis has been undertaken [1] for which the NRRW cohort was expanded to include about another 50,000 workers and the period of follow-up extended by nine years, to the end of 2001. Data on cancer registrations were also included for the first time, together with mortality data.

The third NRRW analysis provides the most precise risk estimates to date of mortality and cancer risks following occupational radiation exposures and strengthens the scientific evidence for raised risks from these exposures. The cancer risk estimates are consistent with international radiation protection standards, both for leukaemia and for all other cancers combined. The third NRRW analysis was funded by the Health and Safety Executive.

Continued follow-up of these workers will be valuable in determining whether radiation-associated risks vary over time or by age, and enables the study of specific cancers and causes of death in more detail. The research will also make a useful contribution to wider national and international studies on the effects of occupational exposures to ionising radiation.

Childhood cancer risks following maternal exposure

Results of a second radiation worker study, on childhood cancer risks following maternal exposure, have also been published [4]. Researchers at the Childhood Cancer Research Group at the University of Oxford and at RPD studied cancer in the children of female radiation workers and concluded that an earlier finding of a raised risk of cancer is not supported by more recent data. In a subgroup of women who worked with radiation during pregnancy, a weak statistical association was found between maternal radiation work and childhood cancer but the evidence is limited by the small numbers involved and the result may be due to chance. This study was funded by the Department of Health.

Further details of these analyses will be published in due course in HPA reports which will be made available on the Agency's website.

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