Health Protection Agency

CDR WEEKLY

Current Issue: Volume **14** Number **23** **Published on**: 4 June 2004

MAIN STORIES THIS WEEK:

REPORTS BY INFECTION:

Respiratory:

Travel Health:

Zoonoses:

Dairy:

CDR SUBSCRIPTION:

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Current Issue: Volume **14** Number **23** **Published on**: 4 June 2004

News

Last updated: **4 June 2004**
Next update due: **10 June 2004**

Outbreak of influenza A (H1N1) in a school in West Sussex

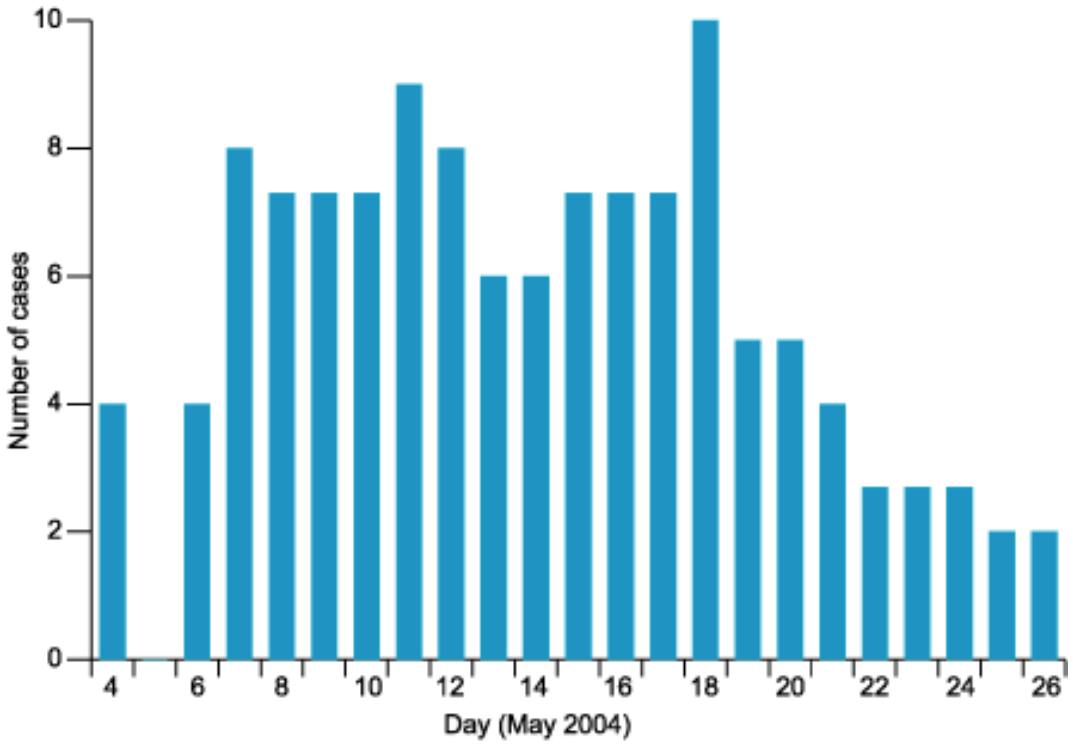
An outbreak of influenza A (subtype H1N1) has occurred in a primary school in West Sussex. The first cases of illness occurred during the first week of May 2004. One child was admitted to hospital during this week with symptoms of fever, confusion, headache, and conjunctivitis.

Staff at the school reported the outbreak to the local Health Protection Unit when substantial numbers of children developed symptoms of fever, nausea, vomiting, cough, and sore throat. Information collected through a questionnaire distributed to parents whose children had been absent from school, suggested a respiratory viral illness with a serial interval of one to three days and duration of one to seven days.

Initial direct immunofluorescence testing of throat swabs by the local laboratory proved negative, but a serology specimen was positive for influenza A by single high titre. The throat swabs were referred to the Health Protection Agency's Enteric, Respiratory, and Neurological Virus Laboratory (ERNVL), Colindale, where influenza A (H1N1) was detected by PCR.

The epidemic curve (figure 1) suggests that the outbreak is now over, as only low numbers of cases were reported by 26 May 2004. Overall, 125/216 (58%) of children aged between four and eight years were affected, with attack rates ranging from 44% in the reception class (aged between four and five years) to 74% in grade one (aged between five and six years).

Figure 1 Epidemic curve for influenza A (H1N1) outbreak (averaged over weekends)



It is unusual to see an outbreak associated with influenza A (H1N1) occurring this late in the season. Further genetic characterisation of the virus is being undertaken.

Influenza A (H1N1) epidemiology

Influenza activity associated with subtype (H1N1) has been low over recent years. The last substantial activity associated with this subtype occurred during the 1997/98 and 2000/01 influenza seasons when approximately 40% of the isolates characterised in each season by ERNVL were A (H1N1). Children aged under 15 years were predominantly affected in 1997/98, and children aged under 5 years and adults aged between 15 and 44 years during 2000/01.

During 2001/02 a new subtype, influenza A (H1N2) emerged as a recombinant of previously circulating influenza A (H1N1) and (H3N2) viruses. Since this time only sporadic isolates of influenza A (H1N1) and (H1N2) have circulated in the United Kingdom.

Outbreaks attributable to influenza have also remained low over recent years; an outbreak of influenza A (H1N1) that occurred in a primary school was reported to the Health Protection Agency's Communicable Disease Surveillance Centre (CDSC) in January 1998 (eight children), and outbreaks of A (H1N untyped) were reported in January 2002 (400/1250 children in Scotland) and March 2003 (one child who was part of a mixed outbreak of H1 and H3N2 in a school).

Influenza activity in England is currently within the range of baseline activity, having peaked early during the 2003/04 season in week 46/2003. Between weeks 30/2003 and 20/2004 only one isolate of influenza (H1N1) and two isolates of (H1N untyped) from hospital derived specimens in children aged less under five years were detected by ERNVL, compared with 1404 detections of influenza A (H3), and five detections of influenza B.

Department of Health publishes its West Nile contingency plan

The Chief Medical Officer has published a contingency plan (1) to prevent and control West Nile virus disease. Although the risk for infection in the United Kingdom (UK) remains low, there is a need to prepare for the possibility of a UK-acquired case. The contingency plan defines roles and responsibilities of parties involved in tackling the disease in the event of a UK-acquired case of WNV infection, and presents a strategy for limiting the impact of the virus.

The plan sets out measures to enhance surveillance, to alert clinicians, and to control mosquito populations. In many of these areas, action has already been taken, while in others it will be initiated only if and when a diagnosis of WNV infection is made. Surveillance of birds, mosquitoes, and horses is in progress, in addition to the human surveillance undertaken by the Health Protection Agency (HPA). Key actions for the public to protect themselves and minimise the risk of infection are included.

Given its mode of transmission, any effort to tackle WNV would require the close liaison of veterinary and health services at the local, regional, and national level. The contingency plan maps out how such co-operation would be achieved in practice through 'Public Health Action in Partnership', the formation of an inter-disciplinary incident control team to take the lead locally, and the creation of a central Government team drawn from the Department of Health, the Department for the Environment, Food and Rural Affairs, and the HPA to provide policy advice nationally.

The document broadly covers:

- Laboratory diagnosis
- Patient care and protection of healthcare individuals
- Public health action
- Surveillance
- Environmental control

It is intended for all those who would have a role in protecting public health if an outbreak were to occur, including the HPA, Primary Care Trusts, Strategic Health Authorities, local authorities, and other agencies.

In preparation for this and as in previous years the HPA has launched its summer surveillance for WNV in humans from 1 June 2004. Details were published in the preceding issue of *CDR Weekly* volume 14, number 22, and on the HPA website, available at <http://www.hpa.org.uk/infections/topics_az/west_nile/menu.htm>.

References

1. Department of Health. *West Nile virus: A contingency plan to protect the public's health*. London: Department of Health, 31 May 2004. Available at <http://www.dh.gov.uk/assetRoot/04/08/33/33/04083333.pdf>.

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Respiratory

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Next update due: **1 July 2004**

Laboratory reports of respiratory infections made to CDSC from Health Protection Agency and NHS laboratories in England and Wales: weeks 19-22/2004

Laboratory reports of respiratory infections made to CDSC from Health Protection Agency and NHS laboratories in England and Wales

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

Table 1 Reports of influenza infection made to CDSC, by week of report: weeks 19-22/2004

Week	19/04	20/04	21/04	22/04	
Week ending	**09/05/04**	**16/05/04**	**23/05/04**	**30/05/04**	**Total**
Influenza A	**2**	**5**	**4**	**3**	**14**
Isolation	–	–	–	–	**–**
DIF	–	–	–	–	**–**
Four-fold rise in paired sera	–	–	–	–	**–**
PCR	–	–	–	–	**–**
Other	2	5	4	3	**14**
Influenza B	**–**	**–**	**–**	**2**	**2**
Isolation	–	–	–	1	**1**
DIF	–	–	–	–	**–**
Four-fold rise in paired sera	–	–	–	–	**–**
PCR	–	–	–	–	**–**
Other	–	–	–	1	**1**
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 19-22/04

Week	19/04	20/04	21/04	22/04	
Week ending	**09/05/04**	**16/05/04**	**23/05/04**	**30/05/04**	**Total**
Adenovirus*	22	35	10	25	**92**
Coronavirus	-	-	-	-	-
Parainfluenza†	21	22	12	19	**74**
Rhinovirus	3	4	-	3	**10**
Respiratory syncytial virus (RSV)‡	12	21	7	12	**52**

*Respiratory samples only. Excludes diagnoses made by electron microscopy (EM).
†Includes parainfluenza types 1, 2, 3, 4, and untyped.
‡Excludes diagnosis made by electron microscopy (EM).

Table 3 Respiratory viral detections by age group: weeks 19-22/04

Age group (years)	<1 year	1-4 years	5-14 years	15-44 years	45-64 years	≥65 years	Unknown	Total
Adenovirus*	10	8	7	53	12	2	–	92
Coronavirus	–	–	–	–	–	–	–	–
Influenza A	–	–	1	3	4	6	–	14
Influenza B	–	–	–	2	–	–	–	2
Parainfluenza†	56	12	3	1	2	–	–	74
Rhinovirus	5	1	3	1	–	–	–	10
Respiratory syncytial virus (RSV)‡	34	5	–	3	3	7	–	52

*Respiratory samples only, and excludes diagnoses made by electron microscopy (EM).
†includes parainfluenza types 1, 2, 3, 4, and untyped.
‡Excludes diagnoses made by electron microscopy (EM).

Table 4 Laboratory reports of infections associated with atypical pneumonia by week of report (non-pneumonic cases*): weeks 19-22/04

Week	19/04	20/04	21/04	22/04	
Week ending	**09/05/04**	**16/05/04**	**23/05/04**	**30/05/04**	**Total**
Coxiella burnettii	–	–	–	2	**2**
Respiratory *Chlamydia* sp†	1	–	1	4	6
Mycoplasma pneumoniae	5	4	3	6	**18**
Legionella sp	6	2	5	9	**22**

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

Table 5 Reports of legionnaires' disease (pneumonic and non-pneumonic*) cases in England and Wales, by week of report: weeks 19-22/04

Week	19/04	20/04	21/04	22/04	
Week ending	**09/05/04**	**16/05/04**	**23/05/04**	**30/05/04**	**Total**
Nosocomial	–	–	–	–	–
Community	2	1	3 (1)	2 (1)	**10**
Travel abroad	4	1	(1)	(2)	**8**
Travel UK	–	–	–	4	**4**
Total	**6**	**2**	**5**	**9**	**22**
Male	5	2	4	8	**19**
Female	1	–	1	1	**3**

* Non-pneumonic cases in brackets.

Seventeen cases were reported with pneumonia and five with non-pneumonic illness, 19 males aged between 19 and 82 years, and three females aged between 36 and 62 years. Ten cases were community acquired infections. No deaths were reported.

Twelve cases were travel associated: England (4), Spain (2), Austria and France (1), Egypt (1), India (1), Italy (1), Mexico (1), and South Africa (1).

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Travel health

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Next update due: **1 July 2004**

Unusual infections associated with foreign travel – part 3: Helminth infections

The infections that will be discussed in this third article on unusual infections are those caused by helminths (parasitic worms). It will focus on nematodes, in particular, the soil-transmitted Helminths. Other nematodes and intestinal cestodes will be covered in part four, to be published on 3 September 2004.

The organisms to be discussed include:

- *Ascaris lumbricoides* (round worm)
- *Ancylostoma duodenale* and *Necator americanus* (hookworms)
- *Trichuris trichiura* (whip worm)

Introduction
Soil-transmitted helminths (STH) are also known as 'common intestinal worms' and are common in tropical and sub-tropical regions of the world, particularly in poorer countries. A high prevalence of STHs in the population tends to indicate a lack of sanitation and is often linked to poverty. Although helminths generally have a worldwide distribution, infections in the United Kingdom (UK) are usually associated with immigrants.

The main modes of transmission are the ingestion of eggs (which subsequently hatch inside the stomach) or larvae from direct contact with infected faeces or soil, or by larval penetration of the skin (usually the feet). Either way, the larvae enter the circulation and make their way to the lungs where they migrate up the respiratory tract (at this stage respiratory symptoms may occur), into the oesophagus and through the digestive tract. The larvae mature inside the intestines and produce eggs where a range of symptoms (depending on the organism) may occur; the eggs are subsequently excreted along with the larvae at various intervals. A clinically significant feature of the biology of worm infections is their inability to reproduce and multiply within the definitive human host.

Disease due to worm infection can occur by direct mechanisms such as blood loss with both immunologic and non-immunologic hosts responses such as eosinophilia, which is often characteristic of helminth infections outside of the gut. Symptoms of helminth infections are usually non-specific such as nausea, tiredness, abdominal pain and loss of appetite. More serious morbidity is usually only apparent when the infection is particularly severe. Hookworm infection can result in anaemia particularly in poor countries where iron intake may be low and malaria is endemic. Similarly, vitamin A deficiency may occur in heavily infected individuals.

Ascaris lumbricoides
Ascaris lumbricoides is commonly known as the 'round worm' and is widespread throughout the world, but prevalence is higher in countries with a moist tropical climate and poor sanitation, where it can be as high as 50% (1). Children of school age are the most affected. Transmission is by ingestion of eggs from contaminated soil or unwashed food that is contaminated with soil that contains infective eggs.

Infection with *A. lumbricoides* is relatively asymptomatic. The eggs hatch in the duodenum and the larvae migrate to the lungs through the circulatory system, occasionally producing respiratory symptoms (Löffler syndrome). Once they reach the trachea they are swallowed, progress to the lumen of the small intestine where they mature into adults. The first signs of infection may be the appearance of worms in the stool or sometimes from the mouth or nose.

Travellers

Between 1990 and 2003 inclusive, there were 2339 laboratory reports of *Ascaris lumbricoides* (around 110 per year since 1999) infection in England and Wales, 777 (33%) of which reported recent travel abroad (includes immigrants and foreign visitors). Seven reports specified no recent travel and the remainder of reports (1555) had no information about travel history reported at all, it is likely that a higher proportion of cases are associated with recent travel abroad than is reported.

Of those reports with a travel history, 46% (354/777) were associated with travel to the Indian sub-continent (183 Bangladesh, 70 India, 70 Pakistan), and 14% (112/777) were associated with travel to sub-Saharan Africa, 21% (23/112) to Nigeria. This probably reflects travel patterns of residents from England and Wales, but also migration patterns as a large proportion of immigrants in the UK are of south Asian or west African origin.

***Ancylostoma duodenale* and *Necator americanus* (Hookworms)**

Ancylostoma duodenale and *Necator americanus* are the main causes of hookworm disease and hookworm anaemia worldwide. Both are endemic in tropical & sub-tropical regions especially south east Asia, the south Pacific, and east Africa (although usually one species predominates in any particular country depending on environmental conditions such as temperature and humidity). In 2002, it was estimated that over 1300 million people were infected with either *A. duodenale* or *N. americanus*, and associated anaemia causes at least 65,000 deaths annually (2).

The life cycles of *Ancylostoma* and *Necator* are very similar except in two respects. Firstly, *Ancylostoma* can infect by ingestion of contaminated food or through the skin, whereas *Necator* only infects through the skin. Secondly, migrating larvae of *Necator* grow and develop in the lungs whereas *Ancylostoma* do not.

Travellers

Between 1990 and 2003, there were 71 laboratory reports of *A. duodenale* and three reports of *N. americanus*. Only 14 reports for *A. duodenale* and none for *N. americanus* specified any details about recent travel abroad. These hookworms do not generally occur in the UK; therefore the travel history is substantially under-reported. It is likely that a majority of infections occur in people migrating to the UK from endemic countries. Of the 14 reports with a travel history, 12 specified recent travel to Asia (four Bangladesh, three Pakistan, one Hong Kong, one Sri Lanka, two to both India and Thailand, one unknown country), one to Nigeria and the other unknown.

Trichuris trichiura

Trichuris trichiura is also known as the whipworm and is common worldwide, especially in warm, moist tropical regions. After hatching, larvae attach to the mucosa of the caecum and ascending colon where they mature into adults. Infection

may cause blood-containing mucoid stools and diarrhoea. Very heavily infected children, usually aged between 5 and 15 years, may suffer from rectal prolapse, clubbing of the fingers, hypoproteinaemia, and anaemia.

Humans are the principal reservoir for this infection. Infection is acquired by ingestion of eggs, which have matured in soil for around three weeks; the main vehicle for transmission therefore tends to be unwashed vegetables, but children may also acquire infection from unwashed hands.

Travellers

Between 1990 and 2003, there were 320 laboratory reports of *Trichuris trichuria* infections in England and Wales reported to the Health Protection Agency's Communicable Disease Surveillance Centre (CDSC), Colindale. Forty-one per cent of reports (1304/3202) specified recent travel abroad, and 19% (251/1304) of those specified recent immigration. Only one report specified no foreign travel at all, therefore nearly 59% (1897/3208) have no information on travel history. Indigenous infection with *Trichuris trichuria* is uncommon in the UK, therefore most, if not all infections reported in England and Wales are likely to have been acquired abroad. Of those with a travel history stated, 83% (1080/1304) specified a country of travel and 40% (435/1080) had travelled to or emigrated from the Indian sub-continent, mainly Bangladesh (61%). Twenty-six per cent (282/1080) had travelled to or emigrated (including refugees) from sub-Saharan and southern Africa, mainly Somalia (24%), Nigeria (15%), and the Democratic Republic of the Congo (11%); and 19% (202/1080) had travelled to or emigrated from south east Asia and the far east, mainly Vietnam (60%).

Conclusion

The above data show that soil-transmitted helminths are imported into England and Wales, either by those who have travelled to an endemic country or by those migrating to or seeking asylum in England and Wales. Many cases are infected with more than one type of helminth, which suggests that living conditions in the areas of infection are sub-

standard. The data are very incomplete and it is not possible to ascertain the proportion of laboratory reports due to migrants to the UK compared with returning travellers. Travel histories need to be substantially improved with more information made available about each patient in terms of dates of travel to and from the UK, the reason for travel and the countries visited.

References

1. Chin J. *Control of Communicable Diseases Manual.* Seventeenth ed. Washington: American Public Health Association, 2000.

2. WHO. Nematodes – hookworm. *WHO Essential Medicines Library.* Geneva: World Health Organization (WHO), 2002-2004. Available at <http://mednet3.who.int/Eml/disease_factsheet.asp?diseaseId=406>.

Current Issue: Volume **14** Number **23** **Published on**: 4 June 2004

Zoonoses

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Common animal associated infections, England and Wales laboratory reports: weeks 18-22/04

Common animal associated infections, England and Wales laboratory reports: weeks 18-22/04

	Total reports for weeks 18-22		Cumulative totals for weeks 01-22	
	2004*	2003	2004*	2003
*Borrelia burgdorferi**‡	3	5	28	25
Leptospira hardjo†§	–	–	–	–
Leptospira icterohaemorrhagiae†§	–	2	3	3
Leptospira other†§	1	1	3	5
Pasteurella haemolytica	-	1	5	2
Pasteurella multocida	29	16	112	104
Pastaurella pneumotropica	1	-	2	3
Pasteurella spp	11	2	36	27
Toxocara canis	–	–	–	1
Toxocara cati	–	–	–	–
Toxocara spp	3	1	3	1
Toxoplasma gondii	4	3	13	16
Toxoplasma spp	3	10	21	29
Capnocytphaga spp	1	–	2	3
Capnocytphaga canimorsus	1	–	1	–
Echinococcus granulosus	1	–	2	2

* provisional data; † by specimen date; ‡ Lyme Disease Reference Laboratory and CDSC.
§ Leptospira Reference Laboratory and CDSC. NA = Not available.

Comments: weeks 18-22/04

***Lyme borreliosis*:** (three): one male, two females. No clinical or epidemiological information.

Leptospirosis:
***Leptospira* spp:** M 21y with no clinical or epidemiological details.

Pasteurellosis: fifteen females, seven males.
***Pasteurella multocida*:** (29): M 48y with an 'infection', F 5y with infected dog bite, F 1y with serious discharge from a dog bite wound, M 54y with a dog bite, M 45y with a cat bite, F 49y with an infected dog bite to right leg, F 70y with a cat bite, M 67y with a cat bite, and 84y bitten by a cat (sex not stated)24 hrs previously. Thirteen females aged between 1y and 95y, and seven males aged between 49 and 78y with no clinical or epidemiological details.

***Pasteurella* spp:** (11): F 72y with cat bite to right hand, F 57y with infected dog bite to forearm. Six females aged between 1y and 92y and three males aged between 1y and 65y with no clinical or epidemiological details.

Pasteurella pneumotropica: (1): M 36y with a dog bite.

Toxocarosis:
Toxocara spp: (3): F 27y, F 75yr, and M 27y.

Toxoplasmosis:

Toxoplasma gondii**:** (4): F 63y with elevated LFTs, F 27y with cysts detected on brain scan, F 37y with acute toxoplasmosis and lymphadenopathy, and F 61y with no clinical details.
***Toxoplasma* spp:** (3): M 23y, F 39y, and M 30y, all with no clinical or epidemiological details.

Other, uncommon infections:
Capnocytophaga canimorsus: (1:) F 57y.
***Capnocytophaga* spp:** (1): F 74y with animal contact.

Echinococcus granulosus: (1): M 30y with no clinical or epidemiological details.

Current Issue: Volume **14** Number **23** **Published on**: 4 June 2004

Diary

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NKVet symposium - emerging zoonoses - new challenges

NKVet symposium - emerging zoonoses - new challenges

The NKVet symposium - emerging zoonoses - new challenges will be held in Uppsala, Sweden, on October 7-8, 2004. The deadline for abstract submission is 15 June 2004, and deadline for early registration for the symposium is 18 August 2004. More details on abstract submission and registration are available at: <http://www.sva.se/nkvet2004/>.