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An outbreak of pertussis at a school in Leicestershire

An outbreak of pertussis has occurred at a primary school in the Vale of Belvoir in north Leicestershire, on the boundaries with Nottinghamshire and Lincolnshire. The outbreak was recognised on 23 May 2002, the first case having developed symptoms on 25 March.



The Head Teacher of the school had first reported concerns that children at the school had whooping cough at the beginning of May, and contacted the Leicestershire Health Protection Team again on 15 May. When contacted, local general practitioners (GPs) reported that they did not think that they were seeing children with pertussis. A further report on 22 May that nearly half of the pupils were coughing prompted a visit to the school by the Health Protection Team on 23 May. At the visit, children were observed to have paroxysmal cough typical of whooping cough.

The school is in a small village. It has 86 full-time pupils aged between 5 and 10 years, 21 part-time pupils aged under 5 years, and 16 teaching and other staff members. Children aged 5 and under are taught in a mobile classroom. Other children are taught in two classrooms in the main school building: children in years one and two (aged between 5 and 7) in one classroom and years three, four, and five (aged between 7 and 10) in the other classroom.

After consultation with the PHLS Communicable Disease Surveillance Centre and the Respiratory and Systemic Infection Laboratory at CPHL, initial action was agreed that included:

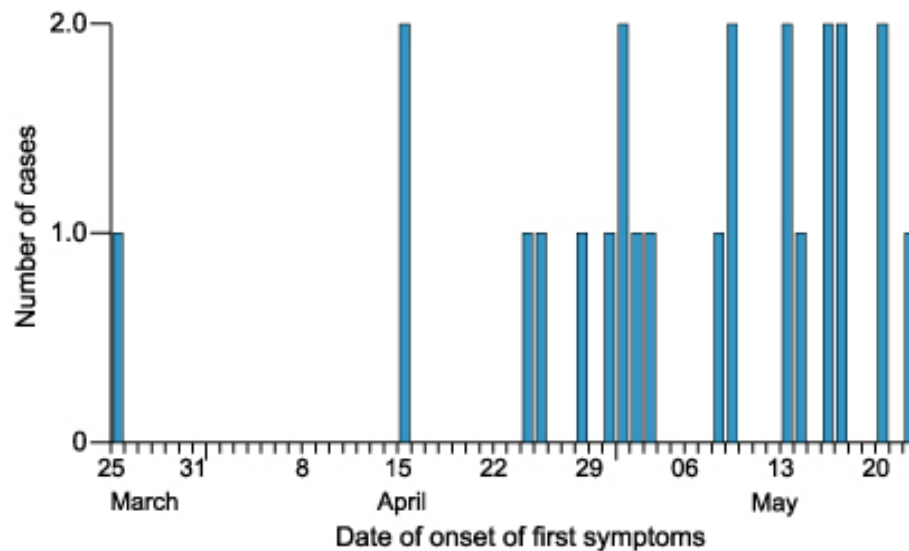
- information about the outbreak and pertussis to be sent to parents of all children at the school;
- information about the outbreak and whooping cough to be sent to all local GP practices with advice on the immediate management of suspected cases;
- a symptom questionnaire to be administered to all children and staff in the school;
- rapid confirmation of disease to be attempted by obtaining pernasal swabs for *Bordetella pertussis* PCR from those with early coryzal symptoms, and blood for serological evidence of recent *B. pertussis* in those with a two week history of typical paroxysmal cough (>100 EU/mL of *B. pertussis* IgG is suggestive of recent infection, in the absence of recent immunisation).

A seven-day course of erythromycin was initially offered to all children and staff at the school because so many appeared to have early coryzal symptoms. Chemoprophylaxis with erythromycin was offered to vulnerable household contacts of cases. NHS Direct was briefed to enable them to handle enquiries from parents, and paediatricians in local NHS Trusts were informed of the outbreak. An outbreak control team first met on 27 May.

Information from the questionnaires suggested a continuing outbreak. The first child became unwell before the Easter holiday break and returned to school on 8 April. A household contact of this child

became unwell a week later followed by several more within the next fortnight. The epidemic curve (figure) demonstrates the continuing progression of the outbreak. There was a total of 23 confirmed and probable cases, including seven members of staff. Six cases were microbiologically confirmed by RSIL-CPHL within 24 hours of receipt of the samples, using culture, PCR, or serology, and 17 were probable cases (cough for more than two weeks) including seven members of staff. Pupils and staff throughout the school were affected, but most cases were aged 5 to 7 years. Childhood vaccine uptake in the area is very high, and only one child was identified who had not received a primary course of pertussis vaccine. Few children were young enough to have benefited from the addition of acellular pertussis to the preschool booster in November 2001.

Figure Leicestershire pertussis outbreak: confirmed and probable cases by date of onset of symptoms



The further measures to investigate and control the outbreak were agreed are as follows, taking into account factors such as the known widespread intolerance to erythromycin:

- Active case finding by providing information and raising awareness through primary care, local schools, and NHS Direct. Active treatment of suspected cases, including anyone with coryzal symptoms and direct epidemiological links to the outbreak.
- Sentinel microbiological surveillance in selected practices in the Vale of Belvoir, with pernasal swabs for *B. pertussis* culture from patients presenting with coryzal symptoms and serological testing for pertussis toxin IgG from patients with cough of more than two weeks duration.
- Strain typing of *B. pertussis* isolates obtained to determine whether the strain was similar to other circulating strains.
- Given the likely intolerance to erythromycin among those offered treatment, azithromycin for six days (dosage as per British National Formulary) should be the treatment of choice in order to ensure compliance.
- All children in the school would be offered a DTaP (diphtheria, tetanus, acellular pertussis) booster injection, as would other vulnerable children in the area *ie* those under the age of 4 months who would not be fully immunised, and other children with immune deficiencies or lung conditions such as cystic fibrosis for whom whooping cough would potentially be a life threatening illness.

The outbreak control team met again on 7 June to review the management of the outbreak. It appeared that the outbreak at the school had been brought under control. Active case finding and sentinel surveillance had identified a small number of additional cases in the local community, but no evidence consistent with a widespread community outbreak. It was agreed that no further control measures were necessary. A further questionnaire will be administered to parents of all children at the school to document the true extent of the outbreak. The 80 children who had been given an additional DTaP booster were asked to complete symptom diaries that will be analysed to determine the extent of adverse reactions that can sometimes occur when children receive more DT than in the routine schedule (there is no available monovalent pertussis vaccine). The strain of *B. pertussis* has been identified by RSIL-CPHL as serotype 1,3 and appears similar to other strains circulating in England and Wales.

Norwalk-like viruses and an oyster-associated outbreak in Sheffield

An outbreak of gastroenteritis associated with the consumption of raw oysters occurred in Sheffield in February 2002. Norwalk-like viruses (NLVs) were detected by RT-PCR at the PHLS Enteric Virus Unit at the Central Public Health Laboratory. Initial detection indicated that a faecal sample from one patient contained two strains of NLV. The sequence analysis revealed that the sample contained both a genogroup II NLV (Hu/NLV/Grimsby/1995/UK) strain and a genogroup I NLV (Hu/NLV/Southampton/1991/UK-GenBank L07418) strain. The Grimsby strain is the predominant NLV strain and is found in between 50% and 60% of institutional outbreaks (*ie* hospitals and nursing homes) in the United Kingdom. The genogroup I (GI) strain Southampton is one of the three most commonly seen GI strains, that are found in 10% of outbreaks, with genogroup II strains causing the remaining 90% of outbreaks. A mixed infection is consistent with the proposed source of infection.

The scale of foodborne NLV infection is poorly understood and strain characterisation may contribute to the improved understanding of NLV transmission pathways and the PHLS Enteric Virus Unit would be pleased to receive faecal samples from oyster-associated and food-related outbreaks where NLVs are thought to be the causative agent. Samples should be sent to Chris Gallimore or Alison Richards, EVU, ERNVL, Central Public Health Laboratory, London, NW9 5HT; email: cgallimore@phls.org.uk.

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General outbreaks of foodborne illness, England and Wales: laboratory reports, weeks 18-22/02*

Health authority	Organism	Place of outbreak	Month of outbreak	No. ill	Cases positive	Suspect vehicle	Evidence
Kent	<i>Salmonella</i> Enteritidis PT4	Residential	May	>1	>1	None	–
Blackpool	<i>Campylobacter</i>	Hotel	May	2	2	None	–

* Preliminary data. Final information will be published in the quarterly report.

M (microbiological): identification of an organism of the same type from cases and in the suspect vehicle, or vehicle ingredient(s), or detection of toxin in faeces or food; S (statistical): a significant statistical association between consumption of the suspect vehicle(s) and being a case; D (descriptive): other evidence, usually descriptive, reported by local investigators as indicating the suspect vehicle.

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Salmonella infections (faecal specimens), England and Wales: reports to the PHLS (salmonella data set*)

Details of serotypes of the 782 salmonella infections recorded in April 2002 are given in the table below. In May 2002, 753 salmonella infections were recorded and preliminary information was received about two outbreaks.

*figures quoted from the PHLS salmonella data set are for isolates confirmed and typed by PHLS Laboratory of Enteric Pathogens (LEP)

	April 2002
Salmonella (provisional total)	782
S. Enteritidis (PT4)	155
S. Enteritidis (other PTs)	263
S. Typhimurium	115
S. Virchow	24
Other (typed)	225

Common gastrointestinal infections, England and Wales: laboratory reports, weeks 18-22/02

Laboratory reports	Number of reports received					Total reports	Cumulative total to	
	18/02	19/02	20/02	21/02	22/02	18-22/02	22/02	22/01
<i>Campylobacter</i>	983	462	796	977	1169	4387	16115	19402
<i>Escherichia coli</i> O157*	8	3	5	8	17	41	114	160
<i>Salmonella</i>	173	144	180	182	187	866	3327	3432
<i>Shigella sonnei</i>	24	12	15	15	12	78	270	350
Rotavirus	1057	488	790	616	476	3427	10986	11064
Norwalk-like virus	24	8	23	20	47	122	1054	995
<i>Cryptosporidium</i>	55	47	36	52	60	250	1103	1068
<i>Giardia</i>	78	35	53	67	61	294	1274	1283

* Vero cytotoxin producing isolates (data from LEP)

General outbreaks of foodborne illness in humans, England and Wales: quarterly report

Table 1 Final information on general outbreaks of foodborne illness: October to December 2001

Local Authority	Organism	Place of outbreak	No. ill	Cases positive	Suspect vehicle	Evidence
Sefton	<i>Salmonella</i> Brandenburg	Hall	46	16	None	–
Aylesbury Vale	<i>S. Enteritidis</i> PT4	Residential	5	3	None	–
St Helens	<i>S. Enteritidis</i> PT6A	Restaurant	5	5	None	–
Cardiff	<i>S. Enteritidis</i> PT6A	Restaurant	15	3	None	–
Richmond	<i>S. Enteritidis</i> PT6A	Restaurant	3	2	None	–
Cardiff	<i>S. Enteritidis</i> PT8	Restaurant	7	4	None	–
Maidstone	<i>S. Enteritidis</i> PT12	Restaurant	19	15	Scallops, king prawns	M
Oxford City	<i>S. Enteritidis</i> PT24	Canteen	22	4	Chocolate mousse	S
Stockton on Tees	<i>S. Typhimurium</i> DT104	Retail	3	3	None	–
Vale of Glamorgan	<i>S. Typhimurium</i> DT104B	Hospital	4	4	None	–
North Dorset	<i>S. Typhimurium</i> DT193	Retail	24	17	Cooked meats	D

East Riding	<i>Clostridium perfringens</i>	Residential	24	7	Roast chicken and gravy	M
Camberley	<i>C. perfringens</i>	Restaurant	27	10	Turkey, roast beef	S
Chorley	<i>Escherichia coli</i> O157 PT21/28	Retail	28	22	Cooked meats	M,D
Wyre	Norwalk-like virus	Restaurant	19	2	None	-
Wirral	Norwalk-like virus	Hotel	17	1	Chicken and/or ham sandwiches	S
Durham City	Unknown	Residential	105	-	Salad vegetables	-
Knowsley	Unknown	Hall	14	-	Chicken curry and rice	S

Table 2 Outbreaks of salmonella infection in: January to March 2002

Outbreak type	S. Enteritidis PT4	Other phage types	S. Typhimurium	Other serotypes	Total
General	3	-	5	1	9
Household	7	18	14	9	48
Acquired abroad	2	1	1	5	9
Total	12	19	20	15	66

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Salmonella serotypes recorded in the PHLS salmonella data set: January to March 2002

All serotypes recorded in the PHLS salmonella data set in the first quarter of 2002 are listed below. There were more than ten reports of 18 serotypes, two to ten reports of 44 serotypes, and one report of 54 serotypes.

January to March 2002 (provisional)			
S. Agona	14	S. Infantis	14
S. Arizonae	13	S. Java	20
S. Bareilly	13	S. Montevideo	17
S. Braenderup	18	S. Newport	37
S. Chester	12	S. Saint-paul	12
S. Derby	11	S. Stanley	14
S. Enteritidis	850	S. Typhimurium	381
S. Hadar	28	S. Unnamed	32
S. Heidelberg	27	S. Virchow	33

Two to ten reports of each of the following serotypes were received:

S. Ajiobo	2	S. Hato	2	S. Oranienburg	9
S. Albany	2	S. Havana	3	S. Oslo	4
S. Anatum	5	S. Hvittingfoss	4	S. Panama	5
S. Bardo	3	S. Ituri	2	S. Poona	5
S. Blockley	7	S. Johannesburg	2	S. Reading	7
S. Bovis-morbificans	2	S. Kedougou	3	S. Richmond	2

S. Brandenburg	2	S. Kentucky	5	S. Rissen	3
S. Bredeneby	8	S. Kottbus	8	S. Rubislaw	2
S. Concord	2	S. Lanka	2	S. Schwarzengrund	4
S. Dublin	5	S. Livingstone	3	S. Senftenberg	4
S. Durban	2	S. London	2	S. Stanleyville	2
S. Durham	2	S. Manhattan	2	S. Tennessee	3
S. Give	3	S. Mbandaka	6	S. Uganda	4
S. Gold-coast	3	S. Mikawasima	2	S. Weltevreden	4
S. Haardt	3	S. Muenchen	6		

One report of each of the following serotypes were received:

S. Abony	S. Eastbourne	S. Kingston	S. Potsdam
S. Adelaide	S. Emek	S. Kirkee	S. Ruiru
S. Agama	S. Falkensee	S. Kisangani	S. San-diego
S. Alachua	S. Flint	S. Marina	S. Shubra
S. Berkeley	S. Galiema	S. Mississippi	S. Stourbridge
S. Binza	S. Halle	S. Monschau	S. Tel-el-kebir
S. Bonariensis	S. Horsham	S. Muenster	S. Thompson
S. Bonn	S. Hull	S. Nairobi	S. Tudu
S. Brikama	S. Ibadan	S. Nigeria	S. Uphill
S. Bron	S. Indiana	S. Nima	S. Wangata
S. Brunei	S. Javiana	S. Nyborg	S. Wernigerode
S. Chandans	S. Jedburgh	S. Ohio	S. Zanzibar
S. Choleraesuis	S. Kapemba	S. Palime	
S. Duisburg	S. Kingabwa	S. Pomona	

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Vero cytotoxin-producing *Escherichia coli* O157: 2001

Seven hundred and sixty-eight isolations of Vero cytotoxin-producing (VT) *Escherichia coli* O157 (VTEC O157) from human infections in England and Wales were confirmed by the PHLS Laboratory of Enteric Pathogens in 2001 compared with 896 in 2000. Approximately 76% of strains were VT2, 23% had both VT1 and VT2 genes and less than 1% were VT1 only. The strains belonged to 21 designated phage types (PTs). The proportions of the six most common types are shown in the table, which also includes the proportions represented by these types in 2000. About 74% of strains belonged to three PTs. PT21/28 was still the most commonly reported type, accounting for 36% of isolates. There were 12 general outbreaks caused by this PT in 2001. Reports of PT2 had fallen steadily since 1996 (1,2) but in 2001 it was the second most common PT and caused three general outbreaks. PT8 remained important in 2001, but the proportion of isolations fell.

Table Predominant phage types of VTEC O157 from human infections in England and Wales: 2001 and 2000

Rank	PT	2001 % total	2000 (rank) % total
1	21/28	36	30 (1)
2	2	21	19 (3)
3	8	17	21 (2)
4	32	5	10 (4)
5	34	4	2 (8)
6	4	3	6 (5)
	Other	14	10

Data from Scotland for 2001 (3) show that the four PTs most commonly reported there were the same as those in England and Wales but the proportions differed. PT21/28 represented 63% of Scottish strains; 11% were PT8, and 9% PT2. Both sets of data showed a fall in PT32 in 2001 compared to 2000.

1. CDSC. Vero cytotoxin-producing *Escherichia coli* O157: phage types reported in 1998. *Commun Dis Rep CDR Wkly* 1999; **9** (33): 291.

2. CDSC. Vero cytotoxin-producing *Escherichia coli* O157: 1999 and 2000. *Commun Dis Rep CDR Wkly* 2001; **11** (19): enteric. Available at <<http://www.phls.org.uk/publications/CDR%20Weekly/PDF%20files/2001/cdr1901.pdf>>

3. SCIEH. Gastro-intestinal infections. *SCIEH Weekly Report* 2002; **36** (17): 118-9.

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Common animal associated infections, England and Wales: laboratory reports, weeks 18-22/2002

Organism	Total reports for weeks 18-22/02		Cumulative totals for weeks 01-22	
	2002*	2001	2002*	2001
<i>Borrelia burgdorferi</i> **#	17	5	20	27
<i>Leptospira hardjo</i> **##	–	–	–	–
<i>Leptospira icterohaemorrhagiae</i> **##	–	–	2	4
<i>Leptospira other</i> **##	–	–	4	3
<i>Pasteurella haemolytica</i>	–	1	1	2
<i>Pasteurella multocida</i>	17	17	61	110
<i>Pasteurella pneumotropica</i>	1	–	1	2
<i>Pasteurella spp</i>	–	7	11	25
<i>Toxocara canis</i>	–	–	–	–
<i>Toxocara cati</i>	–	–	–	–
<i>Toxocara spp</i>	–	–	–	–
<i>Toxoplasma gondii</i>	1	4	12	11
<i>Toxoplasma spp</i>	1	2	14	27

* provisional data; ** by specimen date; # Lyme Disease Reference Laboratory and CDSC;

Leptospira Reference Laboratory and CDSC.

Common imported infections, England and Wales: laboratory reports, weeks 18-22/02

Organism	Total reports for weeks 18-22/02		Cumulative totals for weeks 01-22	
	2002*	2001	2002*	2001
Arbovirus	–	–	–	–
Dengue virus	4	–	5	–
<i>Ascaris</i> spp	7	10	47	45
Hookworm (unspecified)	2	12	104	20
<i>Ancylostoma duodenale</i>	–	–	–	–
<i>Necator americanus</i>	–	–	–	–
<i>Leptospira</i> spp	–	–	–	2
<i>Hymenolepis diminuta</i>	–	–	–	–
<i>Hymenolepis nana</i>	2	6	13	12
<i>Hymenolepis</i> spp	–	–	–	–
<i>Schistosoma haematobium</i>	3	9	22	25
<i>Schistosoma intercalatum</i>	–	–	–	–
<i>Schistosoma mansoni</i>	–	–	13	8
<i>Schistosoma</i> spp	3	–	9	7
<i>Strongyloides stercoralis</i>	–	–	8	16
<i>Strongyloides</i> spp	2	–	2	1

* provisional data



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HIV and hepatitis C virus: occupational exposure and transmission

A one-day conference on occupational exposure and transmission of HIV and hepatitis C virus (HCV) will be held at the Royal Free Hospital, London on Tuesday 22 October 2002. The programme will include an update on the Department of Health guidance, the assessment of and ethics of testing source patients, epidemiology of HIV and HCV infection, occupational exposure to and transmission of HIV and HCV, update on antiretroviral therapy and resistance, and the identification of health care activities and posts involving exposure-prone procedures. The conference is aimed at occupational health and infection control professionals. For further enquiries and booking forms contact F Cooper, Occupational Health and Safety Unit, Royal Free Hospital, London, tel: 020 7830 2513, email:

frederique.cooper@rfh.nthames.nhs.uk