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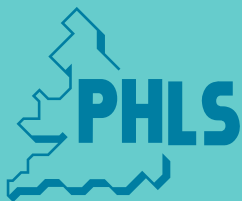
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BACK
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Quadrivalent meningococcal immunisation required for pilgrims to Saudi Arabia

This week the Department of Health in England launched an information campaign aimed at pilgrims travelling to Saudi Arabia, emphasising the need for vaccination with quadrivalent meningococcal vaccine (1). Pilgrimages to Saudi Arabia include those for Hajj and for Umrah. The 2002 Hajj is expected to take place over five days in the last week of February. Umrah can be performed at any time during the year, but preferably during Ramadan, which begins on 17 November 2001. Every year the Saudi Arabian authorities issue a specific visa for about 40,000 UK pilgrims who intend to perform Hajj and/or Umrah.

Following a nation wide outbreak of serogroup W135 meningococcal disease amongst pilgrims and their contacts in 2000, quadrivalent polysaccharide vaccine against meningococcal groups A, C, W135, and Y (ACWYVax manufactured by GlaxoSmithKline) was recommended instead of the usual AC vaccine (2). Subsequent coverage among pilgrims was low, and cases of W135 occurred in the United Kingdom (UK) and following the 2001 Hajj (3). Cases occurred mainly but not exclusively amongst the Muslim population in the UK.

In line with the advice of the Saudi Arabian Ministry of Health, proof of vaccination with quadrivalent vaccine is now required before visas for Hajj/Umrah are issued, for all pilgrims over 2 years of age. The certificate is valid for three years. The vaccine is, as with other travel vaccines, not funded by the NHS.

Effectiveness of group A polysaccharide vaccine has been demonstrated in children from three months of age, but protection is more short lived in young children (4). The effectiveness of the group C component of the polysaccharide vaccine in children aged under 2 years is poor and there is little knowledge about protection against W135 infection in this age group. The visa requirement of the Ministry of Health of Saudi Arabia is for children between 3 months and 2 years of age who travel to the Hajj or Umrah to receive two doses (at least three months apart) of the group A vaccine. A separate group A vaccine is not licensed in the UK, and the Department of Health has therefore recommended that children below 3 years of age receive two doses of the quadrivalent vaccine (ACWYVax), which may offer some protection against the W135 strain as well. To ensure good protection against group C infection, both during travel abroad and in the UK, conjugate Men C vaccination should precede quadrivalent vaccination by at least two weeks. If this is not feasible, vaccination at any time interval is preferable to not offering Men C vaccination with both doses of quadrivalent vaccine.

For travel to Saudi Arabia other than pilgrimage (except seasonal work in the Hajj area) or other countries, the A/C polysaccharide meningococcal vaccine continues to be recommended (5).

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General outbreaks of foodborne illness, England and Wales: laboratory reports, weeks 41-44/01*

Health authority	Organism	Place of outbreak	Month of outbreak	No. ill	Cases positive	Suspect vehicle	Evidence
Liverpool	<i>Salmonella enteritidis</i> PT6a	Restaurant	August	10	5	None	–
Cardiff	<i>S. enteritidis</i> PT8	Restaurant	October	>1	>1	None	–
Tees	<i>S. typhimurium</i> DT104	Community	October	>10	>10	None	–
Cardiff	<i>S. typhimurium</i> DT104B	Hospital	October	3	3	None	–
East Riding and Hull	<i>Clostridium perfringens</i>	Residential	October	24	7	Roast chicken and gravy	M

* 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.

Common gastrointestinal infections, England and Wales: laboratory reports, weeks 41-44/01

	Number of reports received				Total reports	Cumulative reports	
	41/01	42/01	43/01	44/01	41-44/01	2001	2000
Laboratory reports							
<i>Campylobacter</i>	851	874	2092	1142	4959	48003	46744
<i>Escherichia coli</i> O157*	20	8	21	18	67	681	839
<i>Shigella sonnei</i>	13	11	50	8	82	766	622
Rotavirus	58	59	115	74	306	15776	16128
SRSV	8	15	17	25	65	1414	1757
<i>Cryptosporidium</i>	101	103	189	88	481	2827	4399
<i>Giardia</i>	63	58	166	65	352	2869	3374

* Vero cytotoxin producing isolates (data from LEP)

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

Details of serotypes of the 2421 salmonella infections recorded in September 2001 are given in the table below. In October 2001, 1849 salmonella infections were recorded and preliminary information was received about four outbreaks.

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

	September 2001
Salmonella (provisional total)	2421
S. enteritidis (PT4)	751
S. enteritidis (other PTs)	920
S. typhimurium	273
S. virchow	51
Other (typed)	426

Typhoid and paratyphoid, England and Wales: laboratory reports, July to September 2001

Organism and phage type	Number of cases	Infection acquired abroad			Excretors and carriers
		Yes	No	Not reported	
S. typhi					
A	6	–	4	2	–
B2	5	4	–	1	–
C1	1	1	–	–	–
D1-N	2	–	–	2	–
D1	1	1	–	–	–
E1	13	7	–	6	1
E14	3	2	–	1	–
J1	2	1	–	1	–
M1	2	2	–	–	–
O	1	–	–	1	–
Degraded	3	1	–	2	–
Degraded Vi-9	1	–	–	1	–
Untypable	2	1	–	1	–
Untypable Vi-1	4	3	–	1	–
Vi-negative	1	1	–	–	–
46	5	3	–	2	–
Total	52	27	4	21	1
S. paratyphi A					
1	20	15	–	5	–
1A	4	2	–	2	–
2	1	1	–	–	–
4	8	6	–	2	–
13	19	12	–	7	–
RDNC	1	–	–	1	–
Total	53	36	–	17	–

S. paratyphi B					
1 var 1	1	–	–	1	–
Battersea	1	1	–	–	–
Dundee	2	1	–	1	–
Taunton	3	2	–	1	–
Total	7	4	–	3	–

Fifty-two cases and one carrier of *Salmonella typhi* infection were reported in the third quarter of 2001. Twenty-seven cases were infected abroad (Indian subcontinent 21, Morocco 1, Indonesia 1, Nigeria 1, Africa unspecified 1, Abroad 2). There was an outbreak involving four cases in South Wales (CDR Vol 11, No 32, 9 August 2001). In 21 cases the country of infection was not stated.

Fifty-three cases of *S. paratyphi A* infection were reported. Thirty-six cases were infected abroad (Indian subcontinent 34, Somali 1, Abroad 1). In 17 cases the country of infection was not stated.

Seven cases of *S. paratyphi B* were reported. Four cases acquired their infection abroad (Canary Islands 1, Egypt 1, Turkey 2). In three cases the country of infection was not stated.

Surveillance of waterborne disease and water quality: January to June 2001, and summary of 2000

This report is part of a twice-yearly series on the surveillance of waterborne disease and water quality. Also included in this report is a five-year breakdown of the results from the microbiological surveillance of private water supplies, and an update on a retrospective study to investigate the relationship between contamination of private water supplies and flooding or heavy rains.

The PHLS uses a framework for assessing the strength of association between human illness and water exposure in outbreak investigations according to microbiology results from cases, microbiological examination of water samples and descriptive and analytical epidemiology (1). The data on microbiological quality of private water supplies and bathing pools were collected from Bristol, Chelmsford, Chester, Norwich, Nottingham, Preston, and Reading Public Health Laboratories, and the Wessex Environmental Microbiological Services (WEMS).

Table 1 summarises waterborne outbreaks reported to the PHLS Communicable Disease Surveillance Centre (CDSC) in 2000. These have already been published in earlier reports (2,3) and no additional outbreaks occurring in 2000 have been ascertained.

Table 1 Outbreaks and incidents of association between human Infectious Intestinal Disease and water in England and Wales: 2000

Outbreak reference number	Organism	NHS Region	Month	Cases	Laboratory positive	Association*
00/219	Cryptosporidium	North West	March	58	58	Strong
<i>Public water supply. Cases exposed within a single water supply zone with a spring source. Pathogen identified in clinical cases and in drinking water. Well heads to the spring damaged. Animal grazing nearby and heavy rain. Source contaminated with animal faeces. Boil water notice issued. Spring supply switched to an alternative source.</i>						
00/342	Giardia	Wales	March-June	17	56	Strong
<i>Children's nursery. Pupils, staff, and household contacts of symptomatic individuals screened. Statistical association for children with water play - water play suspended. Fastidious attention to hygiene implemented. Treatment of microbiologically confirmed source.</i>						
00/406	Cryptosporidium	Trent	May-June	41	41	Strong
<i>Public swimming pool. Pool closed. Filters back washed. Descriptive epidemiology suggested association with a swimming pool. Organism detected in pool water, pool filters and cases.</i>						
00/440	Cryptosporidium	South West	May-June	8	3	Possible
<i>Farm holiday centre served by private water supply which was partially or incompletely treated. Indicator organism in private water supply but no cryptosporidium detected. Recreational exposure to nearby stream and play on nearby meadows used for grazing.</i>						
00/656	Cryptosporidium	London	September	10	10	Probable
<i>Public swimming pool. Cryptosporidium oocysts identified in cases, pool water and pool filter sand. Pool operating regime reviewed and enhanced.</i>						
00/723	Cryptosporidium	London	August-September	3	3	Possible
<i>Public swimming pool. Cryptosporidium oocysts identified in cases, pool water and pool filter sand. Pool closed for 8 days. Pool operating regime reviewed and enhanced.</i>						
00/766	Campylobacter	Wales	September	281	15	Strong
<i>Public water supply. Influx of surface water into a holding tank for treated water.</i>						
00/870	Cryptosporidium	South West	September - October	12	7	Probable
<i>Public swimming pool: attention to pool operation. Oocysts from cases and water.</i>						
00/972	Cryptosporidium	South West	October-November	5	5	Probable
<i>Club swimming pool. One viable oocyst from filter.</i>						
00/1022	Cryptosporidium	Eastern	September	7	7	Probable
<i>Public swimming pool. Cryptosporidium oocysts identified in cases, pool water and pool filter sand. Pool operating regime reviewed and enhanced.</i>						
00/1023	Cryptosporidium	Trent	September-October	9	9	Probable
<i>Public swimming pool. Cryptosporidium oocysts identified in cases but not in pool, however indicator organisms detected in pool.</i>						

Water related outbreaks of infection

Two water-related outbreaks of infection were ascertained by CDSC between January and June 2001 (table 2). Five cases of cryptosporidium infection, four of whom were under 15 years of age, had onset dates in February and early March 2001, and had used a local swimming pool in the south east region. Samples of water from the main and trainer pools taken in mid-March contained cryptosporidium oocysts. The operating regime of the pool was reviewed with urgent attention to coagulation and backwashing of the filters. Following these actions, no further cryptosporidium oocysts were identified in further pool water samples taken over the next seven days. The second incident involved the swimming pool of a school with 450 pupils in the south east region. One hundred and fifty-two children had enteric symptoms during June 2001 and eight tested positive for cryptosporidium oocysts in faeces. During this period there was a concurrent community outbreak of Norwalk-like virus (NLV) infection, and it is possible that a proportion of enteric illness was due to NLV rather than to cryptosporidium infection. A water sample from the pool tested positive for cryptosporidium oocysts and the pool was closed. Refurbishment of the pool's water treatment plant and filters is planned prior to re-opening in 2002.

Table 2 Outbreaks and incidents of association between human Infectious Intestinal Disease and water in England and Wales: January to June 2001

Outbreak reference number	Organism	NHS Region	Month	Cases		Association*
				Total	Positive	
00/136	Cryptosporidium	South East	February-March	5	4	Strong
<i>Public swimming pool. Cryptosporidium oocysts identified in samples of pool water from main and learner pools and from cases. Pool operating regime reviewed and enhanced. Follow up pool water samples tested negative</i>						
00/347	Cryptosporidium	South East	June	152	8	Strong
<i>School outdoor swimming pool. Cryptosporidium oocysts identified in pool water. The pool was closed and reopening is planned for 2002 after refurbishment of plant and filters. A proportion of symptomatic cases may have been due to Norwalk-Like Virus infection.</i>						

* A proportion may have been due to NLV infection (see text).

Surveillance of water quality

Private water supplies

A private water supply is any water supply that is not provided by a statutorily appointed water company. Private water supplies are divided into category 1 supplies which are used wholly for domestic purposes and category 2 supplies, which include supplies to premises such as hospitals, residential homes, holiday sites, and food preparation premises (2). These categories are further subdivided into classes depending on the volume of water or number of people supplied. About 1% of the population of England and Wales has a private water supply to their homes. Many more people may, however, be exposed transiently to private water supplies, particularly category 2 supplies, when used in hospitals, holiday sites, and for food preparation. There is a statutory obligation for local authorities to monitor private water supplies and the specified frequency varies between two samples per month to one sample every five years, depending on the class of supply. Local authorities also have powers to secure improvements to private water supplies or connection to a mains supply.

Results of microbiological analysis of samples from various classes of private water supply for January to June 2001 are presented (table 3). The presence of *Escherichia coli* indicates that human or animal faecal contamination has occurred and that urgent action should be taken to eradicate the contamination. *E. coli* was isolated from 13% (121 from 927) of supplies examined. This corroborates earlier findings that the microbiological quality of private water supplies is better in the period January to June compared with the period July to December (table 4) (3). The 927 supplies examined yielded a total of 1636 samples, 145 (9%) of which were positive for *E. coli*.

Table 3 Routine, including regulatory, tests of private water supplies: January to June 2001

	Number of supplies (samples)						Category unknown
	Total supplies	Category 1: domestic			Category 2: others*		
		Class F (single dwelling)	Class D and E (≤ 100 people)	Class A to C (> 100 people)	Class 3 to 5 (daily volume $\leq 100\text{m}^3$)	Class 1 and 2 (daily volume $> 100\text{m}^3$)	
Number tested	927 (1636)	81 (120)	38 (61)	4 (7)	131 (196)	7 (114)	666 (1138)
Number positive							
for <i>E. coli</i>	121 (145)	16 (17)	6 (8)	–	29 (29)	–	70 (91)
for total coliforms (including <i>E. coli</i>)	314 (433)	36 (39)	21 (30)	–	60 (66)	–	197 (298)

* supplies to premises such as hospitals, residential homes, holiday sites, and food preparation premises.

Table 4 Percentage of private water supplies positive for *Escherichia coli*: January 1995 to June 2001

Year	% of private water supplies positive for <i>E. coli</i>	
	January-June	July-December
1995	19	42
1996	18	40
1997	13	31
1998	23	37
1999	20	29
2000	17	28
2001	13	-

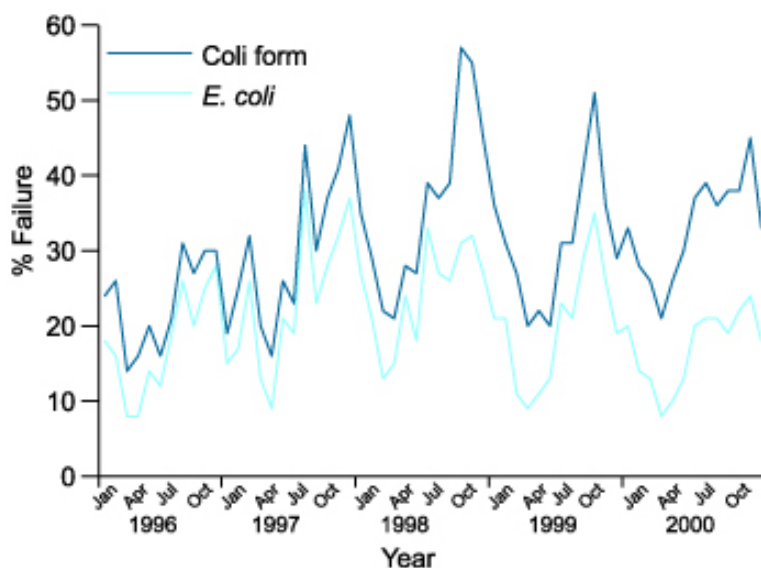
The presence of coliforms other than *E. coli* in water does not specifically indicate faecal contamination, as they are natural inhabitants of many aquatic environments. They are, however, indicators of the efficiency of water treatment and current legislation states that they should not be present in drinking water. Coliforms (including *E. coli*) were isolated from 34% (314 from 927) of supplies, from which 433 samples out of a total of 1636 (26%) were positive.

The percentage of samples positive for *E. coli* from category 1 supplies (13%) was similar to that of samples from category 2 supplies (9%). The results of statutory testing of public water supplies in England and Wales have been compiled and published annually by the Drinking Water Inspectorate since 1992. These reports have shown that the microbiological quality of mains water supplied by the twenty-seven water companies has been continually improving. In 2000, 0.04% and 0.56% of the total samples from water supply zones were positive for *E. coli* and coliforms, respectively (4). In contrast, private water supplies are generally of a poor microbiological quality and have shown no improvement since PHLS surveillance began in 1995.

Review of private water supplies 1996-2000

Figure 1 shows percentage failures for *E. coli* and for coliforms including *E. coli* by year and month. The graph shows that there is a regular seasonal variation. There are peaks, indicating greater contamination of the private water supplies, every year especially during the months of September and October, and to a lesser extent July and August. The difference or variance between the coliform levels and the *E. coli* levels appears to have increased over the five years since 1996, and is greatest between the months of September and December. The variance was greatest in 1998 and 2000. This may be due to adverse weather conditions, including differences in rainfall and temperature, and to the effect of the environment on the survival of *E. coli*.

Figure 1 Microbiological quality of Private Water Supplies. Coliform and *E. coli* failures as percentages of monthly reports (1996 – 2000)



The autumn of the year 2000 was the wettest since records began in 1766. Many parts of England and Wales experienced severe flooding, and there were concerns over the possible association of such events and waterborne illness. In a national survey of private water supplies in 1996 to 1997, 21% of samples and 33% of supplies failed current regulations for *E. coli* on at least one occasion (3). Both this study and the review of the last five years of surveillance data indicate that contamination of private water supplies is seasonal and that there are probably geographical variations in quality. These variations may be partly explained by different weather conditions, such as heavy rainfall. To investigate the relationship between the contamination of private water supplies and the recent flooding or heavy rains, all PHLS and collaborating laboratories throughout England and Wales were requested to send in their microbiological test results on samples collected from private water supplies, between January 1999 and December 2000. The results of 15,423 samples were received from 20 laboratories: Ashford, Bangor, Brighton, Bristol, Carmarthen, Chelmsford, Chester, London, Luton, Newcastle, Norwich, Nottingham, Plymouth, Preston, Reading, Shrewsbury, Stoke, Surrey, Truro, and WEMS. The new data will be used to determine whether there has been any significant deterioration in water quality associated with the flooding.

Pool waters

Guidelines for pool water quality have been formulated and state that *E. coli* should be absent from 100mL samples from all pools and that *Pseudomonas aeruginosa* should be absent from 100mL samples from spa and hydrotherapy pools (5-6). Coliforms should also be absent from 100mL. A count of <10/100mL coliforms is, however, acceptable, provided that they are not in consecutive samples, total viable count (TVC) after 24 hours incubation at 37°C is less than 10 colony forming units per mL (CFU/mL) and the residual disinfection and pH are within the recommended range. A raised TVC may result from heavy pool use and microbial proliferation in the pool water and indicates possible discrepancies in disinfection.

Results from the microbiological analysis of 3742 pool water samples from 1049 pools (57 hydrotherapy, 223 spa, 767 swimming, and two unknown pools) are shown in table 5. The swimming pools were in municipal, leisure, sports centres, and hotels. Pools on a single site, such as learner, diving, and main pools, were counted separately. As in previous years, there was a low rate of isolation of *E. coli*, with 2 % (23 of 1049) of pools positive. The 23 positive pools yielded 24 positive samples. Coliforms (including *E. coli*) were isolated from 66 pools, which yielded 84 positive samples.

The presence of *P. aeruginosa* in hydrotherapy and spa pools is a potential health risk, as outbreaks of disease caused by *P. aeruginosa* have been associated with them. In conventional pools, *P. aeruginosa* is an optional quality parameter and is not always looked for. *P. aeruginosa* was isolated from 29 % (135 from 468) of swimming pools in which it was looked for, 25 % (13 from 52) hydrotherapy pools and 50 % (82 from 162) spa pools (table 5). TVC of greater than 100 colony-forming units per mL were found in 6 % (222 of 3742) and these 222 samples were obtained from 157 pools (table 6).

Table 5 Routine (including regulatory) tests of pool waters: January to June 2001

Organisms	Total pools (samples)	Hydrotherapy pools (samples)	Spa pools (samples)	Swimming pools (samples)	Unknown pool type
Coliforms and <i>E. coli</i>					
Number tested	1049 (3742)	57 (377)	223 (649)	767 (2714)	2 (2)
Number positive for <i>E. coli</i>	23 (24)	2 (2)	8 (9)	13 (13)	-
Total coliforms (including <i>E. coli</i>)	66 (84)	7 (12)	18 (26)	41 (46)	-
<i>Pseudomonas aeruginosa</i>*					
Number tested	682 (2837)	52 (362)	162 (545)	468 (1930)	-
Number positive	208 (439)	13 (29)	82 (132)	135 (278)	-

* not always tested for routinely

Table 6 Highest total viable count in all pool waters (colony forming units per mL)

Total viable count	Pool waters	
	Pools	Samples
0-10	702	3054
11-100	190	473
>100	157	222
Total	1049	3742

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