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NEWS STORIES:

- ▾ H5N1 avian influenza swan in Scotland: follow up
- ▾ Outbreak of measles in Doncaster
- ▾ Arrangements for reporting MRSA data

INFECTION REPORTS

ENTERIC

Enteric Routine Data Reports

- ▾ General outbreaks of foodborne illness in humans, England and Wales, weeks 10-13/06
- ▾ Salmonella infections, (faecal specimens) England and Wales, reports to the HPA (salmonella data set): February 2006
- ▾ Common gastrointestinal infections, England and Wales, laboratory reports: weeks 10-13/06
- ▾ Less common gastrointestinal infections, England and Wales: laboratory reports, weeks 1-13/06

Enteric Infection reports

- ▾ General outbreaks of infectious intestinal disease in England and Wales: 2005
- ▾ Surveillance of waterborne disease outbreaks summary of 2004

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News

Last updated: **13 April 2006**, Volume 16, No 15
Next update due: **21 April 2006**

📄 [H5N1 avian influenza swan in Scotland: follow up](#)

📄 [Outbreak of measles in Doncaster](#)

📄 [Arrangements for reporting MRSA data](#)

📄 [H5N1 avian influenza swan in Scotland: follow up](#)

On Thursday 06 April 2006, the Department for the Environment Food and Rural Affairs (Defra) confirmed that a dead swan found lying at Cellardyke, Fife, on the southeast coast of Scotland had died of highly pathogenic avian influenza H5N1. A 3km wild bird protection zone and 10km wild bird surveillance zone were implemented around Cellardyke, and will remain in place for a minimum of 30 days. A larger wild bird risk area was also implemented around the surveillance zone. Results of tests for H5N1 performed as part of enhanced local surveillance in wild birds continue to be made available, but all are negative so far.

The UK's Chief Veterinary Officers announced on Tuesday 11 April 2006 that the bird had been identified as a Whooper swan (*Cygnus cygnus*) by DNA 'fingerprinting' at the Central Science Laboratory, York. It is believed that the swan originated outside Great Britain, and it is already known that movements of swans associated with cold weather and migration has been a feature of recent developments in avian influenza A/H5N1 in Europe. Whooper swan populations winter across the United Kingdom (UK) and a number of these have been tested over the past few months as part of ongoing routine surveillance: all results so far have been negative. At this time of year Whooper swans leave the UK for their summer breeding grounds. More information is available on the Defra website at <http://www.defra.gov.uk/news/2006/060411a.htm>.

There have been no reports of respiratory illness among State Veterinary Service (SVS) staff responding to the incident in Scotland, or among residents within in the protection or surveillance zones (some 2,200 households). All SVS personnel involved in the response within the 10 km surveillance zone either live locally or are from England and Wales, and lodged temporarily in the Perth area. Those in lodgings returned home on Tuesday 11 April 2006, and new personnel were drafted into the area to continue the response.

There is a very low risk of exposure and an even lower risk of illness to personnel responding to the incident. All incident responders are being advised and monitored on the use of personal protective equipment daily, and have all been advised in writing of the need to report symptoms should they become ill. The HPA is working with Health Protection Scotland, the Scottish Executive, and others to ensure all staff involved are fully supported.

The current level of risk to the general public in the UK remains low: no avian influenza A/H5N1 has been reported in England or in UK poultry. Avian influenza is a disease of birds and although it can pass very rarely and with difficulty to humans, this requires close contact with infected birds. For further information see the World Health Organization website at http://www.who.int/csr/disease/avian_influenza/en/.

Outbreak of measles in Doncaster

Ninety-seven cases of suspected measles from the Doncaster area have been notified to the South Yorkshire Health Protection Unit (SYHPU) since 1 January 2006. To date, 37 cases have been confirmed by laboratory tests (PCR and/or salivary IgM). Twenty-two cases have been negative for both PCR and salivary IgM. Final results are awaited on the remaining cases (figure 1 and 2).

Figure 1 Measles outbreak, notified cases by onset date: 8 January to 8 April 2006

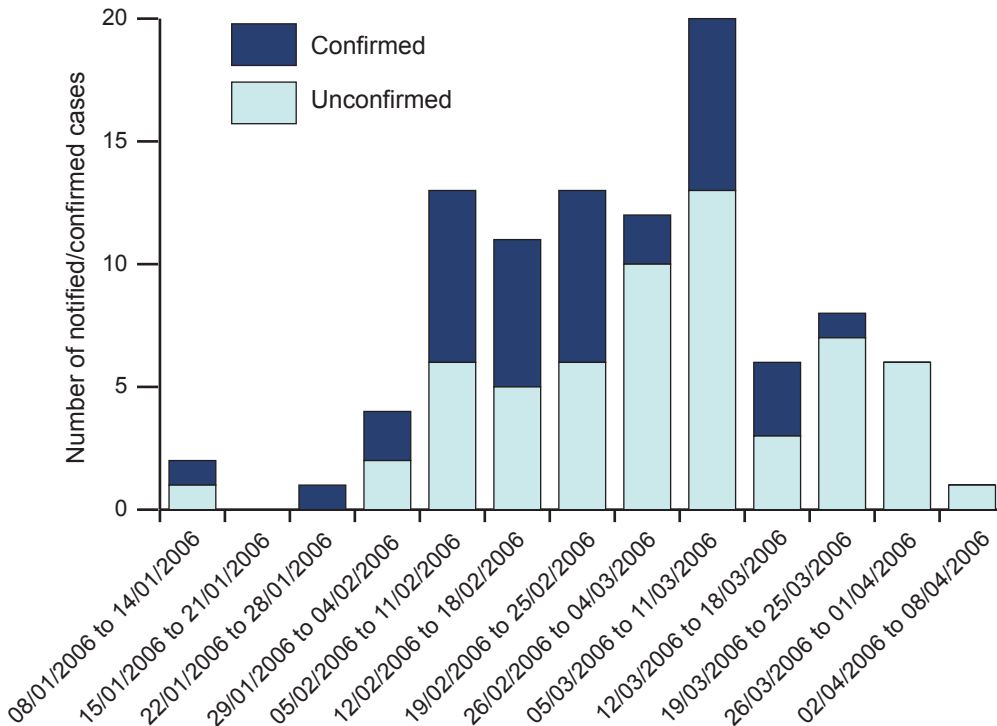
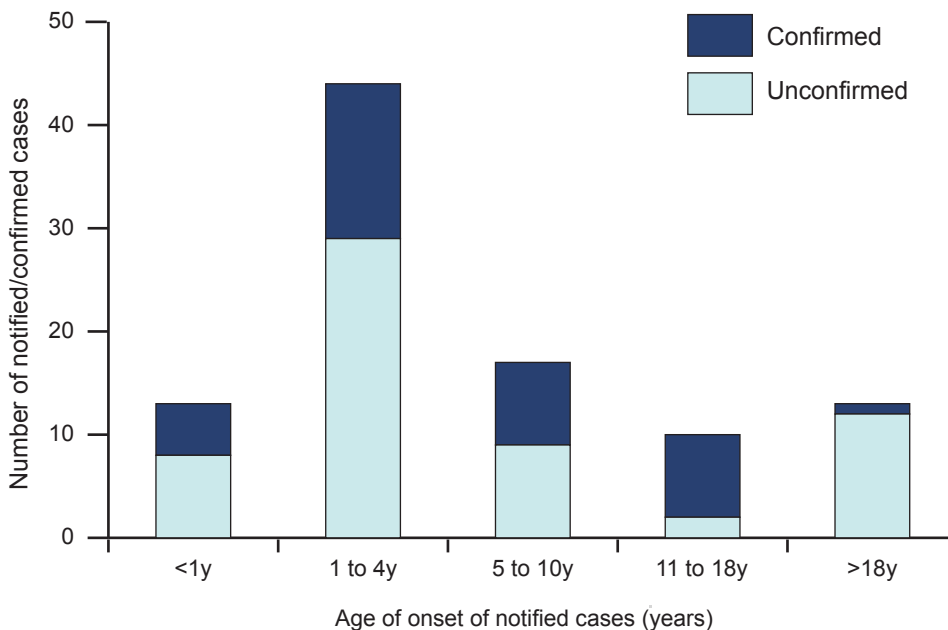


Figure 2 Measles outbreak, notified cases by age of onset: 8 January to 8 April 2006



The first confirmed cases, in week beginning 13 February, were from outbreaks in the local Traveller community, and a playgroup, and an isolated sporadic case. There were no direct links between these three separate incidents, each occurring in geographically distinct areas of Doncaster. A further four cases in travellers were identified retrospectively, linked to the index case. Two of these retrospective cases were resident in Spain but had acquired the illness from contacts in Doncaster. Molecular typing results from six of the early cases from two of the clusters are all the B3 genotype.

Over the following weeks, isolated cases and small family clusters were reported, most of which were unrelated to the playgroup and traveller outbreaks. Around 20% have so far been laboratory confirmed.

PCR testing of throat swabs, urine, and whole blood (preferred minimum of two specimens) was arranged locally, and specimens were forwarded to the Health Protection Agency's Centre for Infections (CfI) for molecular typing. Salivary specimens for IgM testing have been arranged for all community-based cases and for any notified cases with negative PCR results.

SYHPU responded to all notified cases with advice on testing, contact tracing, infection control and protection of susceptibles (as per national guidance) with vaccine and/or human normal immunoglobulin (HNIG). Letters were sent to all schools, nurseries, playgroups and childminders in the district to raise awareness. Briefings were circulated to local PCTs, GP surgeries and hospitals. MMR vaccine was offered to babies aged from 9 months who were close contacts but no changes were made to the routine vaccination schedule for Doncaster children. The outbreak was publicised widely by the local media over several weeks, including television, local radio and newspapers. This was an opportunity to reassure the local community of the safety of the MMR vaccine and to encourage uptake.

The first child to be admitted to hospital was diagnosed as having scarlet fever (a common differential diagnosis), and appropriate infection control measures were not applied. Once the outbreak had been recognised, the hospital introduced a protocol for admitting all suspected cases of measles to prevent nosocomial spread and briefed all clinical staff about measles and the infection control measures required. All children with measles were admitted to a single room staffed by nurses known to be immune. Occupational health screened and/or vaccinated all nursing / medical staff in high risk areas, commencing with paediatric staff. There were four cases of hospital-acquired infection (two confirmed) one in a paediatric nurse and three patients.

There is no evidence of spread within schools. Ninety-five per cent of children in Doncaster have had at least one dose of MMR by their 5th birthday and this appears to have been adequate to prevent school-based outbreaks. There have been three cases of confirmed measles in children who have had a single dose of vaccine but most of the notified cases in vaccinated children have been negative on laboratory testing.

Doncaster normally receives around one notification of measles per month, and prior to these cases, there had been only one case of confirmed measles in a Doncaster resident since routine salivary testing began in October 1994. Although this case had a Doncaster address, they had no contact with Doncaster during the incubation period or while infectious.

This outbreak shows that measles is highly contagious and there is a potential for spread in unvaccinated populations because:

- there is a steadily increasing pool of children with no immunity
- healthcare professionals and parents are unfamiliar with measles
- population mixing, even in pre-school children, is widespread with the potential for dozens of significant contacts before the illness is recognised
- the potential for nosocomial spread is significant and occupational health departments need to ensure that key staff are immune.

Lessons learned locally in this are probably applicable more widely.

Arrangements for reporting MRSA data

A joint letter Reporting MRSA data: overview of arrangements from the Chief Medical Officer and Chief Nursing Officer was published on the Department of Health website on 30 March 2006 (1).

The letter sets out forthcoming changes to arrangements for the collection and checking of the MRSA bacteraemia data returns submitted by NHS acute Trusts. Its contents are for action by Directors of Infection Prevention Control, Infection Control Teams and Medical Microbiologists.

Reference

1. Reporting MRSA data: overview of arrangements PL CMO (2006)2. London: Deptment of Health, 2006. Available at <http://www.dh.gov.uk/PublicationsAndStatistics/LettersAndCirculars/ProfessionalLetters/ChiefMedicalOfficerLetters/ChiefMedicalOfficerLettersArticle/fs/en?CONTENT_ID=4132578&chk=9//dnG>.

Enteric

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Enteric Routine Data Reports

- ▣ [General outbreaks of foodborne illness in humans, England and Wales: weeks 10-13/06](#)
- ▣ [Salmonella infections, \(faecal specimens\) England and Wales, reports to the HPA \(salmonella data set\): February 2006](#)
- ▣ [Common gastrointestinal infections, England and Wales, laboratory reports: weeks 10-13/06](#)
- ▣ [Less common gastrointestinal infections, England and Wales : laboratory reports, weeks 1-13/06](#)

Enteric Infection reports

- ▣ [Surveillance of waterborne disease outbreaks summary of 2004](#)
- ▣ [General outbreaks of infectious intestinal disease in England and Wales: 2005](#)

▣ [General outbreaks of foodborne illness in humans, England and Wales: weeks 10-13/06](#)

Preliminary information has been received about the following outbreaks.

Health Protection Unit	Organism	Location of food prepared or served	Month of outbreak	Number ill	Cases positive	Suspect vehicle	Evidence
Coventry & Warwickshire	<i>Clostridium perfringens</i>	Restaurant	March	7	4	None	–

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; D (descriptive): other evidence, usually descriptive, reported by local investigators as indicating the suspect vehicle or food; S (statistical): a significant statistical association between consumption of the suspect vehicle(s) and being a case.

▣ [Salmonella infections \(faecal specimens\), England and Wales, reports to the HPA \(salmonella data set\): February 2006](#)

Details of serotypes of 498 Salmonella infections recorded in February 2006 are given in the table below. In March 2006, 387 Salmonella infections were recorded.

	February 2006
S. Enteritidis (PT4)	37
S. Enteritidis (other PTs)	139
S. Typhimurium	61
S. Virchow	25
Others (typed)	236
Total <i>Salmonella</i> (provisional data)*	498

*Figures quoted from the Health Protection Agency salmonella data set are for isolates confirmed and typed by Laboratory of Enteric Pathogens (LEP).

Common gastrointestinal infections, England and Wales, laboratory reports: weeks 10-13/06

Laboratory reports	Number of reports received				Total reports	Cumulative total to	
	10/06	11/06	12/06	13/06	10-13/06	13/06	13/05
<i>Campylobacter</i>	521	419	455	298	1693	6829	6981
<i>Escherichia coli</i> O157*	10	–	6	13	29	79	55
<i>Salmonella</i> †	126	119	62	3	310	1402	1681
<i>Shigella sonnei</i>	8	6	3	2	19	101	176
Rotavirus	1095	996	1021	659	3771	7646	9002
Norovirus	234	177	184	70	665	2151	1744
cryptosporidium	28	26	25	19	98	428	334
Giardia	38	41	32	36	147	541	600

*Vero cytotoxin-producing isolates (data from Health Protection Agency's Laboratory of Enteric Pathogens (LEP).

† Data from Health Protection Agency's Laboratory of Enteric Pathogens.

NA= Not available at time of publication.

Less common gastrointestinal infections, England and Wales, laboratory reports: weeks 1-13/06

Laboratory reports	Total reports 1-13/06	Cumulative total 1-13/06	Cumulative total 1-13/05
Adenovirus	2	2	3
Astrovirus	29	29	80
Sapovirus	2	2	8
<i>Shigella boydii</i>	20	20	24
<i>Shigella dysenteriae</i>	11	11	8
<i>Shigella flexneri</i>	61	61	70
<i>Aeromonas</i>	59	59	27
<i>Plesiomonas</i>	9	9	6
Vibrio	3	3	7
Yersinia	4	4	12
<i>Entamoeba histolytica</i>	21	21	27
<i>Blastocystis hominis</i>	42	42	86
<i>Dientamoeba fragilis</i>	13	13	33

General outbreaks of infectious intestinal disease in England and Wales: 2005

Initial reports of 897 general outbreaks of infectious intestinal disease in England and Wales were reported to the Health Protection Agency Environmental and Enteric Diseases Department during 2005. Completed surveillance questionnaires have been received for 742 of these outbreaks, to date, giving a provisional response rate of 83%.

In total, 15,125 people were affected (range: 2 to 1000; mean = 20), with 129 hospital admissions (range: 1 to 8; mean = 2) and 11 deaths reported in 11 separate outbreaks.

Norovirus was the most commonly implicated pathogen (36%) (table 1) and for a large number (193) of the outbreaks of unknown aetiology, a viral agent was also suspected. Most of these occurred as the result of person-to-person transmission. Foodborne transmission accounted for a less than 10% of outbreaks, with salmonellas predominating. Most outbreaks occurred in residential institutions (54%) schools (16%), or hospitals (13%), precipitated by person-to-person transmission (78%) (table 2). The commercial catering sector was responsible for over half (55%) of the foodborne outbreaks reported. Person-to-person spread was the predominant mode of transmission.

Table 1 Outbreaks of infectious intestinal disease by pathogen and mode, England and Wales: 2005

Pathogen	Person to Person	Foodborne	Other /Unknown	Total
Norovirus	227	8	30	265
<i>Salmonella</i> spp.	1	33	4	38
Rotavirus	18	–	–	18
<i>Clostridium perfringens</i>	–	9	1	10
<i>Clostridium difficile</i>	8	–	–	8
<i>Escherichia coli</i> O157	5	2	2	9
Campylobacter	–	7	1	8
Scombrototoxic Fish Poisoning	–	7	–	7
cryptosporidium	–	–	6	6
Astrovirus	4	–	–	4
<i>Shigella sonnei</i>	1	–	1	2
Calicivirus	1	–	–	1
Mixed aetiology	8	–	2	10
Other	1	–	–	1
Unknown	307	5	43	355
Total	581	71	90	742

Table 2 Outbreaks of infectious intestinal disease by venue and mode, England and Wales: 2005

Place	Person-to - Person	Foodborne	Other/ Unknown	Total
Residential institution	365	6	32	403
School	107	2	9	118
Hospital	73	1	27	101
Commercial catering premises	7	39	6	52
Club/centre	16	6	2	24
Community	3	2	2	7
Farm	–	–	5	5
Shop retailer	–	5	–	5
Private House	1	3	–	4
Holiday camp	2	–	–	2
Swimming pool	–	–	1	1
University/college	1	–	–	1
Workplace	–	–	1	1

Other	6	7	5	18
Total	581	71	90	742

Surveillance of waterborne disease outbreaks summary of 2004

This report covers surveillance of waterborne disease outbreaks in 2004. In July 2006, the waterborne disease report for 2005 will be published.

Nine waterborne outbreaks of infectious intestinal disease were reported to the Health Protection Agency's Communicable Disease Surveillance Centre* (CDSC) in 2004 (summarised in table 1). Six outbreaks of cryptosporidium and two outbreaks of verotoxin-producing *Escherichia coli* (VTEC) O157 were linked to recreational waters. Untreated private drinking water supplies were implicated in the remaining two outbreaks, one of which was due to norovirus and one to VTEC O157. A total of four VTEC O157 cases were hospitalised.

In outbreak investigations the strength of association between water exposure and human disease is determined according to microbiological test results from cases, microbiological examination of water samples, and descriptive and analytical epidemiology (1).

Table 1 Outbreaks and incidents of infectious intestinal disease associated with water in England and Wales: 2004

Outbreak reference number	Organism	Region	Month	Total affected (lab confirmed cases)	Suspected source of outbreak	Association between water exposure & illness
04/281	Cryptosporidium	East	March to April	13 (9)	Associated with a public swimming pool	Strong
04/274	Norovirus	West Midlands	April	36 (3)	Associated with a private drinking water supply on a farm	Probable
04/186	Cryptosporidium	Yorkshire & Humber	May to June	7 (7)	Linked to a public swimming pool	Possible
04/020	Verotoxin-producing <i>E. coli</i> (VTEC) O157	North East	June	6 (6)	Associated with a private drinking water supply on a caravan site	Probable
04/063	VTEC O157 PT21/28	South West	August	12 (12)	Associated with a stream running across a public beach	Probable
04/081	VTEC O157 phage type PT2 VT2	North West	September	13 (13)	Associated with a leisure centre swimming pool	Probable
04/446	Cryptosporidium	West Midlands	October to November	12 (9)	Associated with a school swimming pool used by community groups	Strong
04/371	<i>Cryptosporidium hominis</i>	Yorkshire & Humber	October to November	10 (9)	Associated with a leisure centre swimming pool	Strong
04/659	Cryptosporidium	West Midlands	October to November	6 (6)	Associated with a leisure centre swimming pool	Probable

In March 2004 an outbreak of cryptosporidiosis affected thirteen children in the East of England, linked to a nursery and a public swimming pool. The index case was suspected to have become infected during a farm visit, before attending the nursery. Several nursery-school children then visited the public swimming pool. Nine cases were laboratory-confirmed as due to cryptosporidiosis and water samples tested positive for oocysts. Together with descriptive epidemiological evidence this is suggestive of a strong association between water exposure and human illness. The pool's sand filters were changed as a control measure.

An outbreak associated with a private water supply affected 33 school students and three adults from the West Midlands on a field trip on a Shropshire farm. Three cases were laboratory-confirmed as norovirus. The attack rate was extremely high among children consuming unboiled water from a field tap (94%; 33/35). Affected adults experienced milder symptoms and were thought to have consumed mainly boiled water. Samples taken from the field tap were heavily contaminated with coliforms and *E. coli* (non-O157), although norovirus testing was not performed. The strength of association was, therefore, assessed as probable. The field tap, which was supplied by an untreated borehole and not used routinely, was subsequently disconnected and the field was no longer used for camping.

An outbreak involving seven people was associated with a swimming pool in the Yorkshire and Humber region. All cases were laboratory-confirmed as due to cryptosporidiosis, although oocysts were not detected in pool water samples; the strength of association was assessed as possible. Control measures applied included backwashing filters and improving overall pool management according to operators' guidance and advice from the Health Protection Agency. Subsequent inspection by an independent engineer did not identify any problems with sand filters or pool processes.

A further outbreak associated with a private drinking water supply affected six people on a caravan site in the North East of England region, one of whom had to be hospitalised. All cases were laboratory-confirmed as verotoxin-producing *E. coli* (VTEC) O157. The pathogen was detected in the water supply, which was untreated and sourced by a spring. The strength of association was assessed as probable. Control measures included issuing a boil water notice and flushing the water supply system. An ultraviolet lamp and filters were also installed for water treatment.

An outbreak of VTEC O157 phage type (PT) 21/28 associated with a stream running across a beach in the South West region affected 12 people. All cases were laboratory-confirmed and seven were considered primary cases.

After the incident, environmental samples positive for *E. coli* O157 were found at five sites, both in the stream and in cattle faeces in the catchment area of the stream. None of the environmental isolates were PT 21/28.

Epidemiological analysis indicated a probable association between illness and stream water exposure (odds ratio=1.27-undefined, p=0.02). Grazing cattle were thought to be a potential source of contamination; the area of beach around the stream was closed to public access.

Thirteen laboratory-confirmed cases of VTEC O157 were associated with a public swimming pool in the North West of England region. Eight cases were determined to be primary and five secondary. Three individuals were hospitalised, two of whom were admitted with haemolytic uraemic syndrome, and one required dialysis. The outbreak followed blockage of the pool's chlorine dosing pump, resulting in low disinfectant levels. Although pool water tested negative for coliforms and *E. coli* O157, descriptive epidemiology pointed to a probable association. The system was chlorinated, drained, and cleaned and all systems in place were reviewed by an independent pool expert.

An outbreak associated with a school swimming pool in the West Midlands region – which is used widely by school and community groups – affected twelve people. Nine cases were laboratory-confirmed and cryptosporidium oocysts were also detected in pool water samples. The strength of association between water exposure and human illness was strong. The pool was closed, emptied, cleaned and disinfected. Filters were backwashed prior to refilling the pool, and samples tested negative for cryptosporidium.

A further outbreak affected ten people in the Yorkshire and Humber region, six of whom had been to a leisure centre swimming pool (although around fifty people using the pool were thought to have been ill in total). Nine cases tested positive for *Cryptosporidium hominis* and oocysts were also detected in pool water samples, indicating a strong association between illness and water exposure. Pool water was cycled and sand filters were backwashed before being examined by an external consultant. Following application of these control measures large cartridge filter samples tested negative for cryptosporidium.

The final outbreak in 2004 was associated with a swimming pool in the West Midlands and involved six laboratory-confirmed cases of *Cryptosporidium hominis* in children. Pool water samples tested negative for cryptosporidium but positive for indicator organisms; this is suggestive of a probable association. The filter inspection window (used for viewing the clarity of drain water following backwashing) had become dirty and discoloured and was subsequently replaced. A system for recording pool incidents and contamination was introduced.

Swimming pool and drinking water associated outbreaks of cryptosporidiosis

Between 1995 and 2004, fifty-two waterborne outbreaks of cryptosporidiosis were reported to CDSC*. Thirty-four of these were associated with swimming pools and eleven with public drinking water supplies.

Since the mid-1990s the number of cryptosporidiosis outbreaks linked to public drinking water supplies has declined significantly (figure 1). There has also been a reduction in cases of cryptosporidiosis occurring in the first two quarters of the year, with fewer cases in these quarters than in any previous year (figure 2). Cases in the autumn months have remained at or above previous levels. As there is a seasonal difference in the distribution of *Cryptosporidium parvum* and *C. hominis*, this reduction in disease has mostly affected *C. parvum* (4). Genotyping data have shown that *C. parvum* – associated with zoonotic transmission – predominates in the spring, whereas the autumn peak is typically caused by both *C. parvum* and *C. hominis* (5). The source of infection associated with the third and fourth quarters remains unclear, but swimming pools and foreign travel probably contribute to a proportion of this. Public water supplies, provided by statutorily appointed water companies, serve approximately 53 million people in England and Wales (99.5% of the population) and are regulated by the Drinking Water Inspectorate (6). On 1 April 2000, regulations were introduced requiring all public water providers in England and Wales to assess the risk of *Cryptosporidium* contamination in source waters and monitor treated water for oocysts. The apparent reduction in disease associated with improved drinking water treatment implies that further intervention in both drinking water and other areas might contribute to additional disease reduction.

Figure 1 Swimming pool and drinking water associated outbreaks of cryptosporidiosis in England and Wales: 1995-2004

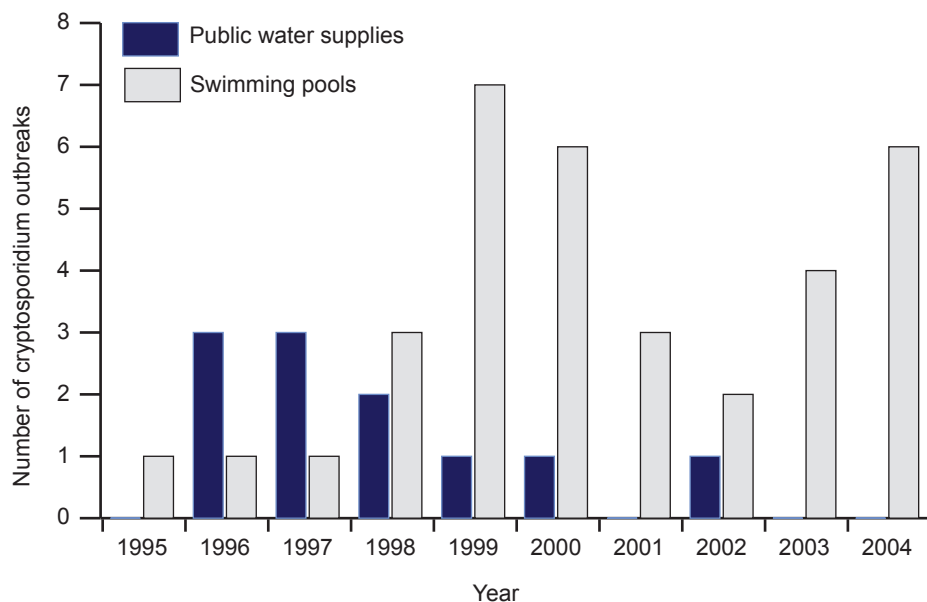
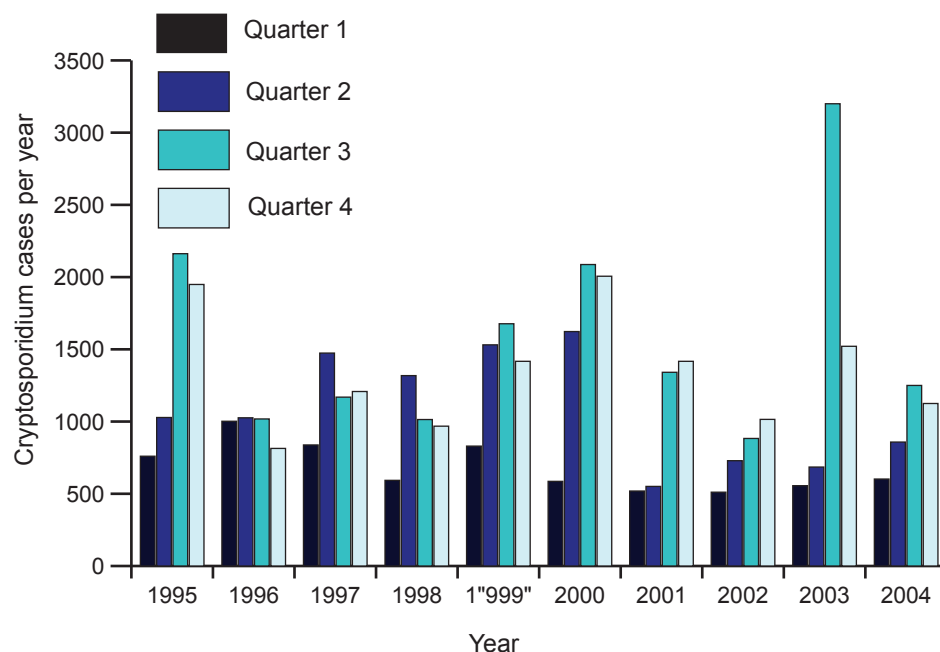


Figure 2 Cryptosporidiosis cases in England and Wales by quarter: 1995-2004



Over the past decade there has been considerable variation in the annual number of swimming pool-associated cryptosporidiosis outbreaks (figure 1). As there do not appear to be major changes in pool operation or use that might explain these variations, it is likely that they reflect an increased ability to recognise and investigate these outbreaks in recent years.

It is difficult to prevent faecal contamination of swimming pools. Pool operators should remind people that if they have gastro-intestinal symptoms, they should not use swimming pools until at least two weeks after symptoms have subsided. The evidence from some outbreak investigations has indicated instances of sub-optimal flocculation and filtration, as well as conducting backwashing during the day rather than in the evening, after swimming has been stopped.

Analytical and descriptive epidemiological studies, as well as microbiological investigation, are important in providing evidence for swimming pool associated outbreaks.

Legionnaires' Disease

Legionnaires' disease is an uncommon form of pneumonia caused by bacteria of the genus *Legionella*, most commonly the species *Legionella pneumophila*. Legionella bacteria naturally occur in warm aquatic habitats and are able to colonise water distribution systems. Infection is normally acquired by inhalation of aerosols from an *L. pneumophila* infected water source. Outbreaks are commonly linked to wet cooling systems (cooling towers and evaporative condensers), hot and cold water systems or spa pools (also known as hot tubs and whirlpool spas), although a variety of other sources have been implicated including cutting fluids, clinical humidifiers, natural warm spas/hot springs, potting compost, humidifiers associated with food display cabinets, indoor fountains, aerobic effluent treatment lagoons, and air scrubbers.

An outbreak of legionnaires' disease is defined as two or more cases linked by area (residence, work, or locations visited) and with sufficiently close dates of onset (within six months for hospital and community acquired infections), for which there is strong epidemiological evidence of a common source of infection, with or without supporting microbiology. Individual cases are confirmed by clinical or radiological evidence of pneumonia along with positive microbiological diagnosis (culture, four-fold rise in serum antibodies or antigen detection in urine), or are taken as presumptive cases (single high titres in serum antibodies, PCR, or other methods). There may be considerable time lag between first and second outbreak cases (up to two years for travel-associated outbreaks); as a result several outbreaks beginning in 2003 were recognised in 2004. For the purpose of this report, they are recorded as 2004 outbreaks.

In 2004, fifteen outbreaks of legionnaires' disease not associated with travel outside the UK (involving at least two English or Welsh cases) were reported to CDSC*, resulting in forty-one cases and seven deaths. In two instances the source of infection was identified as a water distribution system. The first of these occurred in the South West of England between May 2003 and August 2005 (recognised in 2004), involving four cases and two deaths. The second involved two cases in the South East in September 2004, one of whom died. Between September 2003 and June 2004 two cases were associated with a spa pool in the Channel Isles. A cooling tower was implicated in a later outbreak in the Midlands between January and February 2004, involving two cases. In the remaining eleven outbreaks, the source of infection was not identified. Eight of these began in August 2004 in various regions across England, involving between two and four cases each, and a total of two deaths.

References

1. CDSC. Strength of association between human illness and water: revised definitions for use in outbreak investigations. *Commun Dis Rep CDR Weekly* [serial online] 1996 [cited 12 April 2006]; **6**(8):65,68. Available at: <<http://www.hpa.org.uk/cdr/archives/CDR96/cdr0896.pdf>>.
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- 4 The Drinking Water Inspectorate (DWI) website [online].[Accessed 12 April 2006]. Available at: <<http://www.dwi.gov.uk>>.

Footnote

*CDSC became part of the HPA's Centre for Infections Division in 2005.