

4. Enteric diseases

Campylobacter infection

Summary of notifications

The department received notifications for 6,386 cases of *Campylobacter* infection in 2004, for 3,533 males (55 per cent) and 2,838 females (44 per cent); sex was not specified for 15 cases (one per cent). The median age of persons notified was 29

years (range: three days to 104 years) and notification rates per 100,000 population were highest for children aged under five years (figure 7). Notification rates were highest for the Gippsland region (figure 8). As in previous years, notifications were generally more frequent during the warmer months.

Risk factors

Risk factor information was not routinely collected.

Outbreak investigations

There were three outbreaks of *Campylobacter* investigated in 2004. The first outbreak of *Campylobacter* was in a military facility. There were 15 cases; five were confirmed as *Campylobacter* and onsets for cases ranged from 23 May to 13 June. It was not possible to conduct an analytical study for this outbreak as the cases could not be interviewed, so a source was unable to be determined. Given the spread of onsets, transmission for at least some of the cases was likely to have been person to person.

In September 2004, the department received nine notifications of *Campylobacter* in residents of the same aged care facility. Local government undertook an investigation at the facility and determined that meals were provided by an off site kitchen, which also provided meals to other sites. No illness was reported in residents or staff of any of these other facilities during this period. Illness was only reported from residents and staff in one of the two areas in the facility and the investigation revealed that residents and staff from this area had attended a barbeque two days prior to the first onset of illness. A detailed food history could not be obtained from the residents as many suffer from dementia or poor memory.

In total there were 24 cases (16 residents and eight staff) of which 11 were confirmed with *Campylobacter* infection. Findings suggested that the most likely source of illness for the majority of cases was having attended and consumed food

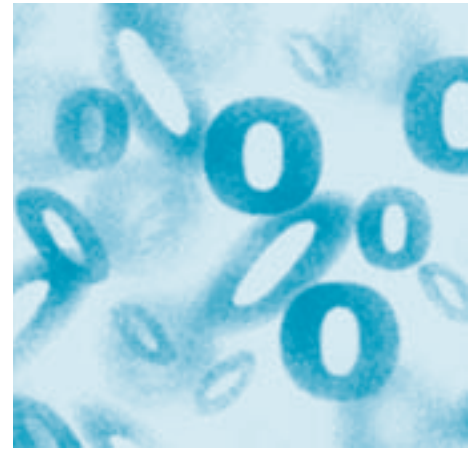


Figure 7: Notified cases of *Campylobacter* infection, by age group and rate per 100,000 population, Victoria, 2004

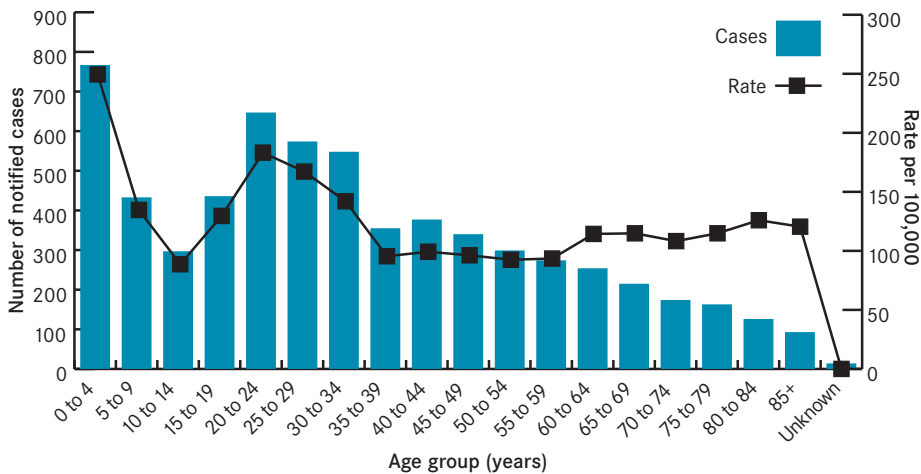
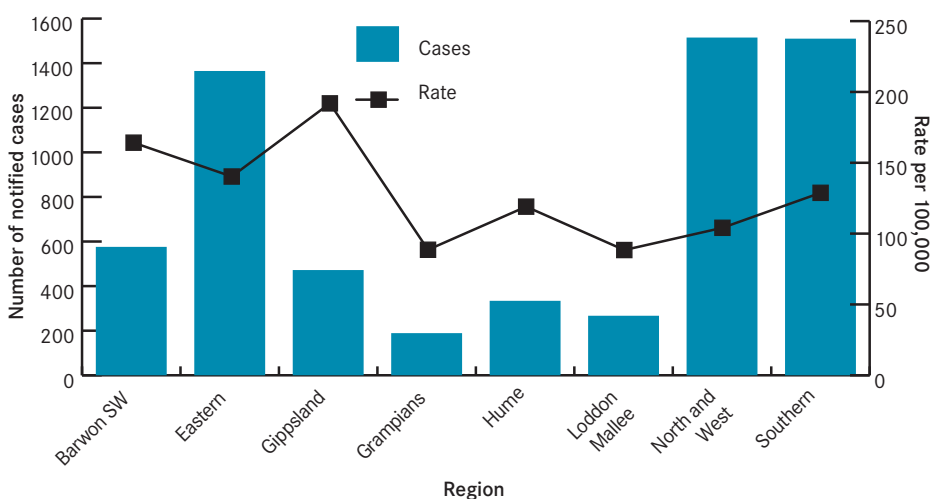


Figure 8: Notified cases of *Campylobacter* infection, by region and rate per 100,000 population, Victoria, 2004



at the barbeque. Six cases (one resident and five staff) did not attend the barbeque and it is suspected that these may have been secondary cases as their onsets were several days after the initial cases.

In December, the Communicable Disease Control Unit was notified of illness in a group of residents of an aged care hostel in rural Victoria. A total of six residents and one staff member had been ill with diarrhoea (100 per cent), abdominal pain (43 per cent), nausea (26 per cent) and vomiting (14 per cent). Onsets of illness ranged over three days and duration was from three to six days. Three of the four faecal specimens collected were positive for *Campylobacter jejuni*. Council inspected the premises and reviewed food processes, which were found to be satisfactory. As the residents were unable to be interviewed a summary of symptoms and illness history was not collected. An analytical study was unable to be conducted and therefore no food source could be identified in this investigation. The water supply to the facility was investigated and was found to be an unreticulated, untreated supply via rainwater tanks. Residents ate meals in the dining room and water was provided in jugs during meals. Water was sampled directly from the rainwater tank that provided water to the dining room and submitted for analysis. High levels of bacteria, including *E. coli* were found in the water, but no *Campylobacter* was isolated. The hostel has since removed the rainwater tank from operation and replaced the drinking water with a serviced purified water-dispensing unit in the dining room.

Comment

Campylobacter is a major cause of enteric disease and is thought to be responsible for the majority of food-borne disease in developed countries. Prevention of infection depends on good personal and food hygiene, particularly the adequate washing of vegetables and cooking of raw meats.

Drinking unpasteurised milk and not washing hands after handling farm animals have been documented as causing outbreaks of *Campylobacter* infection and other enteric diseases with more serious complications, such as verotoxin producing *E. coli* infections. The department's brochure 'Reducing the risk of gastroenteritis at open farms, petting zoos and animal exhibits' is available at <http://www.health.vic.gov.au/ideas/regulations/animal.htm>

Cholera

Summary of notifications

There were two notified cases of cholera in 2004. The first case was a 34-year-old female who became unwell within a few hours of arriving in Australia after travelling on a holiday to India. She most likely acquired her infection in Delhi. *Vibrio cholerae* O1 Ogawa bv El Tor was cultured from her faecal specimen. The second case was a 33-year-old female who also acquired her infection whilst on holiday in India. *Vibrio cholerae* O1 Ogawa was cultured from her faecal specimen. Both cholera cases also had mixed infections with *Campylobacter*.

Outbreak and other investigations

No outbreaks were identified.

Comment

Travellers to endemic areas should be advised to take special care to avoid potentially contaminated water and food prepared with untreated water. This includes ice used by some hotels and restaurants to cool drinks.

Cryptosporidiosis

Summary of notifications

The department received notifications for 305 cases of cryptosporidiosis in 2004, a 43 per cent increase on the number of cases for 2003. There were 168 males (55 per cent) and 137 females (45 per cent) notified. The median age was nine years (range: six months to 74 years) and notification rates were highest for persons aged zero to four years (figure 9). Notification rates were highest for the Gippsland region (figure 10).

Risk factors

Risk factor information was not routinely collected.

Outbreak and other investigations

There were no point source outbreaks of cryptosporidiosis in 2004. In May a cluster investigation of nine cases, who lived in the same geographical area of Melbourne, was commenced to determine if they had any common exposures. Cases ranged in age from one to 34 years and there were six males and three females. Only eight cases could be contacted and it was determined that three cases swam at the same pool during their incubation period and had onsets of illness within the same three-day period. Council investigated the pool and found water quality and the pool's test records to be in accordance with the standards. No further cases

Figure 9: Notified cases of cryptosporidiosis, by age group and rate per 100,000 population, Victoria, 2004

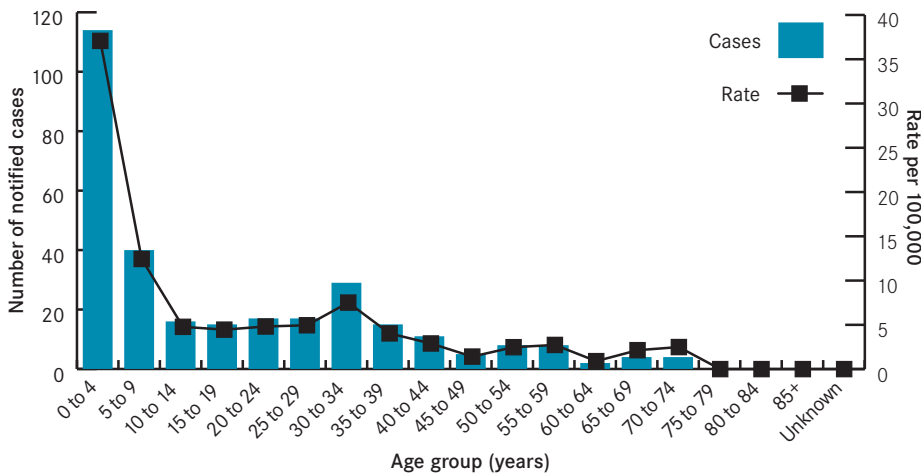
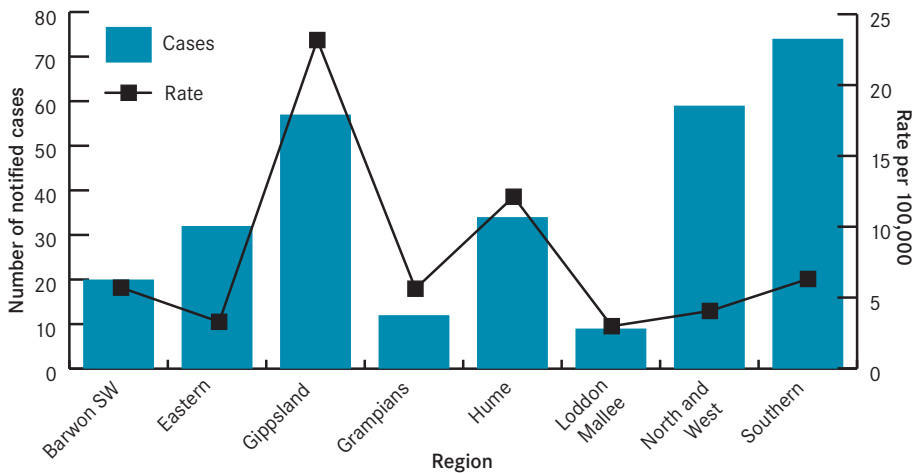


Figure 10: Notified cases of cryptosporidiosis, by region and rate per 100,000 population, Victoria, 2004



linked to the pool were reported.

Comment

Major outbreaks of cryptosporidiosis have been attributed to both contaminated drinking water and recreational water use. Sporadic cryptosporidiosis can be avoided by educating people about personal hygiene, excluding people with diarrhoea

from swimming in pools until symptoms have subsided, and ensuring swimming pool owners are aware of pool hygiene procedures. Infection in rural areas appears to be predominantly associated with contact with farm animals and is more frequent during the calving season.

Food- and water-borne illness

Medical practitioners are required to notify the department of suspected cases or outbreaks of food- and water-borne illness, regardless of aetiology. This allows for the early investigation of possible sources of illness where food or water is suspected, which is important for preventing further cases. These notifications are classified as 'group A' and must be notified within 24 hours.

Although the notification system was originally intended for situations of two or more related cases, the department often receives single notifications when a medical practitioner suspects a particular food or water source was associated with the illness. Local government environmental health officers investigate sporadic cases. Pathogens that are not notifiable under the Health (Infectious Diseases) Regulations 2001, including rare gastrointestinal infections, are also recorded. Notifiable pathogens are covered in separate sections of this report.

Summary of notifications

In 2004, the department received notifications for 905 cases of specific organisms/agents (not reported elsewhere) associated with gastrointestinal illnesses potentially linked to food or water (table 4). This total represented an increase of 90 per cent on notifications in 2003.

Table 4: Notified cases of food – and water-borne illness, by causative organism/agent, Victoria, 2004

Organism/agent	Number
Norovirus	878
Clostridium perfringens	5
Rotavirus	10
Scombrototoxin	9
Vibrio parahaemolyticus	2
Adenovirus	1
Total	905

Outbreak and other investigations

In 2004, the department was notified of 263 outbreaks of gastrointestinal illness affecting at least 6,242 people. Of these outbreaks, 20 were considered to be food-borne or probable food-borne outbreaks, with the majority of the remainder being spread by person-to-person transmission. Settings in which outbreaks were reported included aged care facilities (151 outbreaks), hospitals (48), commercial caterers (15), childcare facilities (13), disability/rehabilitation centres (ten), restaurants/hotels (nine), private residences (six), overnight camps (three), holiday facilities (three), schools (two), play centre (one), recreation (one), and a military institution (one).

Organisms/agents responsible for the 263 outbreaks were norovirus (156 outbreaks), *Salmonella* (seven), rotavirus (six), *Campylobacter* (three), *Clostridium perfringens* (one), scombrototoxin (one) and adenovirus (one). In 88 outbreaks, the organism/agent responsible was unknown, but 54 of these outbreaks were suspected to have been viral and seven were suspected to have been caused by *Clostridium perfringens*.

There was a 174 per cent increase on the number of norovirus outbreaks notified this year compared with 2003 (57 outbreaks). Of these outbreaks, 144 occurred in hospitals, disability or aged care facilities, and over 4,365 people were affected.

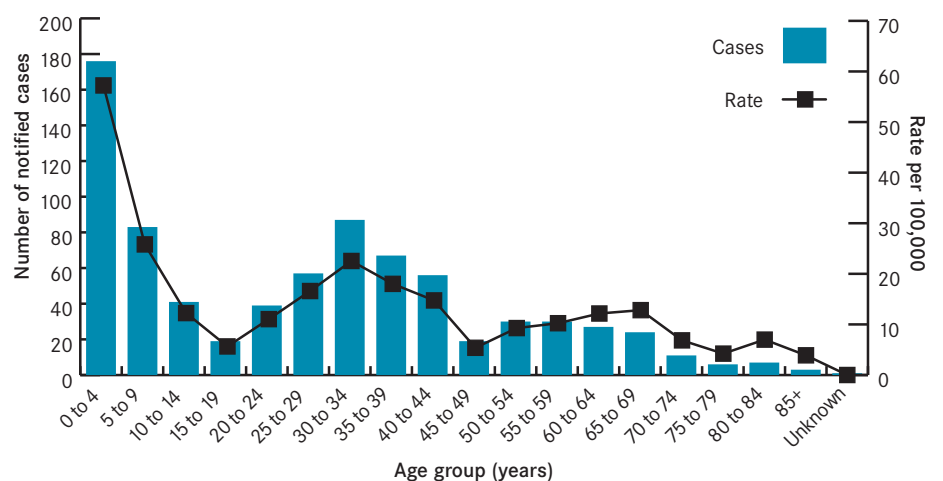
Salmonella and *Campylobacter*, outbreaks are discussed further in the respective sections of this report.

Giardiasis

Summary of notifications

The department received notifications for 783 cases of giardiasis in 2004 (compared with 772 cases notified in 2003), 427 for males (55 per cent) and 352 females (45 per cent); sex was not specified for four notifications. The median age of cases was 28 years (range: four months to 101 years). Notification rates were highest among those aged zero to four years, with a secondary peak in adults aged 30–34 years (figure 11). Notification rates were highest for the Southern Metropolitan region (figure 12).

Figure 11: Notified cases of giardiasis, by age group and rate per 100,000 population Victoria, 2004



Risk factors

Risk factor information was not routinely collected.

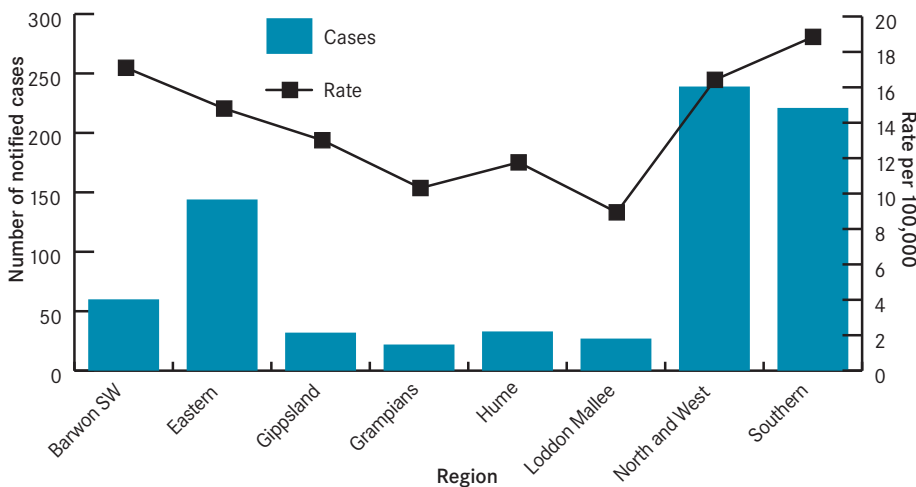
Outbreak and other investigations

No point source outbreaks were identified in 2004. A cluster of 14 cases of giardiasis notified to the department between early July and mid August, and who all lived in one metropolitan area of Melbourne, was investigated to determine if there were any common exposures amongst cases. Cases ranged in age from one to 69 years and there were five males and nine females. Thirteen cases were interviewed but no common exposures were identified.

Comment

Giardiasis spreads rapidly in childcare centres and institutions. Personal hygiene, particularly hand washing before eating and handling food, and after toilet use and changing nappies, is critical to the control of this disease.

Figure 12: Notified cases of giardiasis, by region and rate per 100,000 population Victoria, 2004



Haemolytic uraemic syndrome and verotoxin-producing *E. coli*

Escherichia coli are common bacteria normally found in the gut of warm-blooded animals. There are many strains of *E. coli*, most of which are harmless. Some strains, however, can produce toxins that are pathogenic in humans; one type is known as verotoxin-producing *E. coli* (VTEC), also referred to as shiga-like toxin-producing *E. coli* (STEC). The most common symptom is diarrhoea, which can range from mild to severe, and may be bloody and accompanied by stomach cramps. Symptoms can be severe in children and people with reduced immunity.

Haemolytic uraemic syndrome (HUS) is a rare condition affecting the kidneys and bloodstream that can be caused by VTEC. Abdominal pains and bloody diarrhoea mark the onset of a prodromal illness, which progresses to kidney failure and anaemia. In Victoria, if a case of HUS also meets the case definition of VTEC, it will be counted only once (as a case of HUS).

Verotoxin-producing *E. coli*

Summary of notifications

The department received notifications for four cases of VTEC in 2004, all of whom were females. The cases ranged in age from eight to 71 years (median age of 23 years). Table five lists the various serogroups and phage types.

Risk factors

Two cases had contact with farm animals during their incubation period and another case acquired her infection overseas. Risk factors for the fourth case included consuming unwashed berries and a hamburger in her incubation period. Samples of berries and soil from the farm where the berries were grown were tested and found to be negative for VTEC.

Outbreak and other investigations

No outbreaks were identified and no links were found among the cases. A source could not be positively identified for any of the cases.

Comment

Once a case is identified, person-to-person transmission must be prevented by being careful with personal hygiene and excluding cases from food and beverage preparation. Infection can be prevented by adequately cooking meat products (particularly minced beef) and not consuming unpasteurised milk and dairy products.

Table 5: Notified cases of Verotoxin-producing *E. coli* (VTEC) and haemolytic uraemic syndrome (HUS), by serogroup and phage type, Victoria, 2004

<i>E. coli</i> serogroup and phage type	VTEC	HUS
<i>E. coli</i> O26:H11	1	0
<i>E. coli</i> O5:H-	1	0
<i>E. coli</i> O157 H:-	1	0
<i>E. coli</i> O157:H7	1	0
No <i>E. coli</i> isolated clinical diagnosis	0	1
Total	4	1

Haemolytic uraemic syndrome

Summary of notifications

There was one notified case of HUS in 2004, in a 40-year-old male. VTEC was not isolated from a faecal specimen, however *Campylobacter* was isolated. The case was clinically diagnosed with haemolytic uraemic syndrome and thrombotic thrombocytopenia purpura.

Risk factors

The case had consumed salami and drank from a private water supply during his incubation period.

Outbreak and other investigations Hepatitis A

No outbreaks were identified.

Comment

Children under five years of age are at the greatest risk of developing HUS, and outbreaks have been associated with the consumption of food contaminated with VTEC.

Summary of notifications

In 2004, there were 73 notified cases of hepatitis A sporadically throughout the year, (65 confirmed and eight probable) a decrease of 22 per cent compared with 93 notifications in 2003 (figure 13). There were 46 (63 per cent) notified cases in males and 27 (37 per cent) in females. Notification rates were highest for those aged five to nine years (figure 14). There were 27 hospitalisations.

Risk factors

Overseas travel was the most frequently identified risk factor, accounting for 29 cases (40 per cent) (table 6). Risk factor information was available for 72 cases (99 per cent) but in most cases the source of the infection could not be identified.

Table 6: Risk factors for acquiring hepatitis A infection, Victoria, 2004

Risk factor (suspected source)	Number	Per cent
Overseas travel	29	39.7
Overseas travel and household contact with a case	4	5.5
Non household contact with a case	1	1.4
Men who have sex with men	1	1.4
Household contact with case	6	8.2
Intravenous drug users	1	1.4
Source unknown	30	41.0
Unable to contact	1	1.4
Total	73	100

Figure 13: Notified cases of hepatitis A, by month of notification, Victoria, 2000–2004

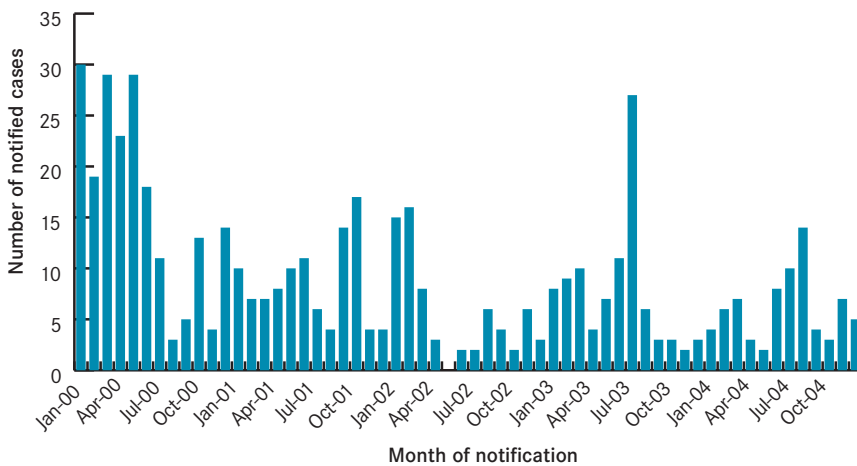
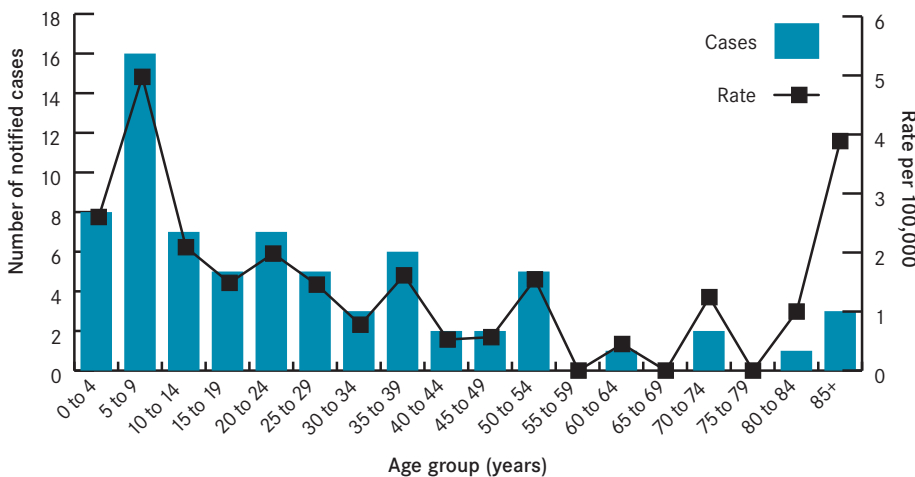


Figure 14: Notified cases of hepatitis A, by age group and rate per 100,000 population, Victoria, 2004



Outbreaks and other investigations

There were three family clusters of hepatitis A investigated in 2004.

The first cluster was investigated in May and it was determined that the index case had an onset of illness in April during a family visit to Lebanon but was never tested for hepatitis A virus (HAV). This child met the definition for a probable case. After returning to Australia, a sibling became unwell in May and was diagnosed as HAV positive. Two additional siblings had onsets of illness in June and were confirmed with hepatitis A.

A second cluster of cases in a family was investigated in June. There were five cases (four confirmed and one probable) that had onsets between 19 June and 29 June after returning from Lebanon on 2 June. All cases had contact with a jaundiced child in Lebanon.

In July, a third cluster of cases in one household group was investigated. The index case became ill with jaundice in March whilst in Iraq and was never tested for hepatitis A. A sibling became unwell in mid June just prior to returning to Australia and was later confirmed as HAV positive. This confirmed case may have acquired the infection from close household contact with his brother or from an unknown source overseas. A further five siblings became unwell after arrival back in Australia, three with onsets in late July and two with onsets in early August. These cases declined testing but were counted as probable cases as they had an epidemiological link to a confirmed case and had clinical hepatitis without a non-infectious cause.

Comment

Hepatitis A notified cases continued to decline in Victoria in 2004 (figure 13). The reasons for this are unclear and may reflect a greater awareness amongst travellers and other at-risk groups, and improved uptake of the vaccine. Vaccination should be encouraged for people intending to travel overseas and those in high-risk occupations such as childcare workers and health care professionals.

Hepatitis E

Summary of notifications

The department received notifications for 11 cases of hepatitis E in 2004, in five females and six males, aged between 18 and 60 years. All diagnoses were confirmed by the detection of IgG in serum by enzyme immunoassay in the presence of a clinically compatible illness.

Risk factors

The department was able to contact ten of the cases and confirmed that six had acquired their infection in India, one in Vietnam, one in Thailand and two had travelled to multiple Asian countries including India. One case could not be contacted but the doctor confirmed that he had acquired his infection in India.

Outbreak and other investigations

No links were identified among the cases.

Comment

Hepatitis E is an acute enteric illness with a clinical course similar to that of hepatitis A. The diagnosis should be considered in persons with acute hepatitis and a history of travel to endemic areas. Persons intending to travel to endemic regions should be advised to take care with personal hygiene and avoid the consumption of undercooked foods and untreated water.

Listeriosis

Summary of notifications

The department received notifications for 13 cases of listeriosis in 2004, in eight males and five females. The median age of cases was 52 years (range: 0 days to 84 years). There were three materno-foetal cases, with one foetal death reported, giving a materno-foetal case fatality rate of 33 per cent.

Two of the ten non-materno-foetal cases died, corresponding to a case fatality rate of 20 per cent. Three cases presented with septicaemia, three cases presented with meningitis and three cases presented with meningitis and septicaemia (including one who also had a brain abscess). The tenth case had *Listeria monocytogenes* isolated from hip joint fluid.

Risk factors

High risk foods identified in case follow-up included sliced cold meats and soft cheese. Risk factors were identified for four of the ten non-materno-foetal cases. These included cancer (one case), renal transplant (one case), steroid treatment for ulcerative colitis (one case) and an unknown immunosuppressive illness (one case).

Outbreak and other investigations

Two of the materno-foetal cases occurred in the same hospital, and both babies were born in the same delivery room, 27 hours apart. The possibility of cross-contamination was investigated. In the earlier birth, both the mother and baby were unwell, the baby died soon after birth (at 27 weeks gestation). *L. monocytogenes* was cultured from a placental swab and a post-mortem blood sample. In the second birth the mother and baby were well (baby delivered at 28 weeks), but the

placenta showed signs of inflammation, and *L. monocytogenes* was cultured from a placental swab, while surface swabs, CSF, blood and gastric aspirate from the baby, and urine and high vaginal swabs from the mother were negative. Infection control at the hospital investigated and it was found that the area where placentas are examined and weighed is not routinely sanitised between deliveries, giving a possible opportunity for cross contamination from one placenta to the next. This practice has now changed and the area is sanitised between every delivery. The hospital laboratory checked their practices and were satisfied that no breaches occurred in association with these two patients' specimens. Repeated testing of the placental swabs of the second case were negative. Since the placenta in the second case showed signs of infection, and no other pathogens were cultured, the infection control physician at the hospital confirmed the diagnosis of listeriosis in this case, rather than cross-contamination of specimens. The third materno foetal case was also born in the same hospital although this was six months earlier than these cases occurred.

To inform epidemiological investigations, Microbiological Diagnostic Unit (MDU) at The University of Melbourne routinely conducts molecular typing using pulse-field gel electrophoresis (PFGE) on all isolates from notified cases. PFGE is also routinely conducted on any food samples submitted in relation to cases in which *L. monocytogenes* is detected.

Ten isolates were forwarded to MDU in 2004 and eight different patterns were found in these isolates. One PFGE type was shared by all three materno foetal cases born in the same hospital however, no source was identified for these or any of the other cases notified.

Comment

Advice on food hygiene and appropriate diet should be given to susceptible groups, particularly pregnant women, the elderly and the immunocompromised. Current information available includes the National Health and Medical Research Council (NHMRC) statement on *Listeria* for medical practitioners. Pamphlets available include the Food Standards Australia New Zealand (FSANZ) pamphlet 'Important health message, *Listeria* and pregnancy' and the department's *Listeria* poster and pamphlet, which are available in seven languages. The department's pamphlet is available online at http://www.health.vic.gov.au/ideas/diseases/listeria_facts.htm.

In recent years, notified cases of materno-foetal of listeriosis have fallen, likely as a result of the increase in information provided to pregnant women about the risk of *Listeria* infection and the foods to be avoided during pregnancy. In 2004, the department implemented a *Listeria* awareness and education program for carers of patients at high risk of acquiring listeriosis.

Salmonellosis

Summary of notifications

The department received notifications for 1,130 cases of salmonellosis in 2004, a decrease of 11 per cent on the total in 2003. Among the cases, the male-to-female ratio was 1:1.1 and the median age was 24 years (range: 20 days to 98 years). Notification rates were highest among those aged zero to four years (74 cases per 100,000), accounting for 20 per cent of the total notifications for the year (figure 15).

Figure 16 shows the geographic distribution of cases across the nine departmental regions. Notification rates were highest for the Barwon South Western region and the Grampians region (31 and 29 per 100,000 respectively).

MDU performs identification of *Salmonella* isolates in Victoria. In 2004, *S. Typhimurium* 9 was the most common serotype/phage type identified, accounting for 13 per cent of the total *Salmonella* notifications received for the year (table 7).

Table 7: Ten most common types of *Salmonella* notified, Victoria, 2004

Salmonella serotype and phage type	Number	Per cent
<i>S. Typhimurium</i> 9	145	13
<i>S. Typhimurium</i> 170	137	12
<i>S. Typhimurium</i> 135	88	8
<i>S. Typhimurium</i> 197	59	5
<i>S. Infantis</i>	43	4
<i>S. Typhimurium</i> u290	36	3
<i>S. Typhimurium</i> 126	28	2
<i>S. Virchow</i> 8	26	2
<i>S. Typhimurium</i> 12	23	2
<i>S. Stanley</i>	21	2
<i>S. Typhimurium</i> RDNC	21	2
Other	503	45
Total	1,130	100

Figure 15: Notified cases of salmonellosis, by age group and rate per 100,000 population, Victoria, 2004

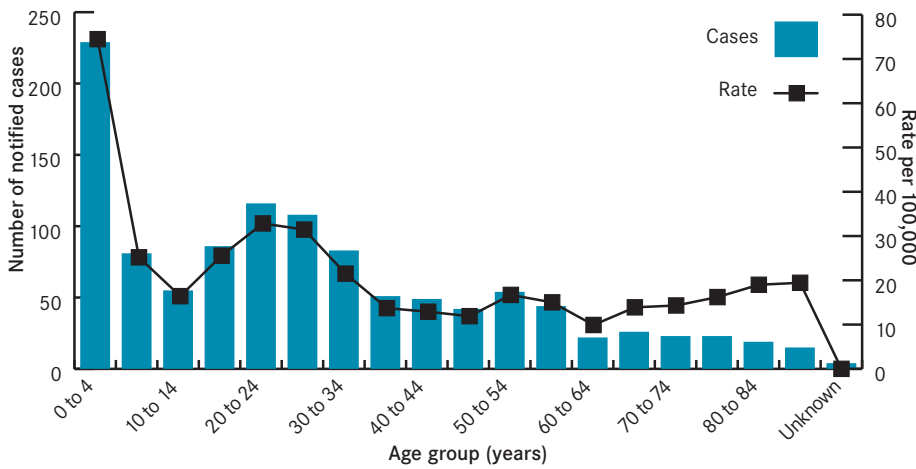
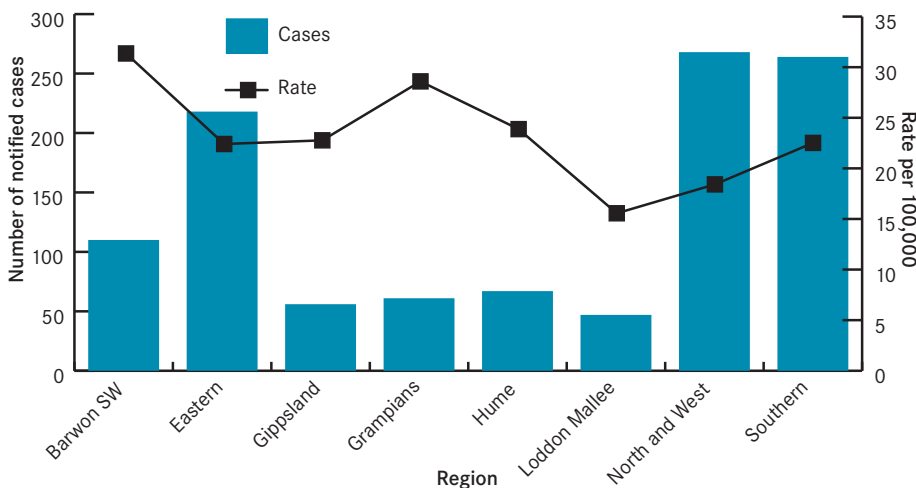


Figure 16: Notified cases of salmonellosis, by region and rate per 100,000 population, Victoria, 2004



Salmonella Enteritidis

S. Enteritidis is not endemic in Australia, except for phage type 26, which occurs in Queensland. It is a significant *Salmonella* serovar in that the organism vertically transmits from the chicken to the egg. Common overseas, it has been responsible for large outbreaks of disease associated with undercooked eggs and products containing eggs. In Victoria, the department follows up all cases of S. Enteritidis to ascertain whether the infection was acquired overseas.

The department received notifications for 86 cases of S. Enteritidis in 2004, compared with 51 notifications in 2003 (an increase of 69 per cent). As in previous years, Indonesia was most frequently reported as the country of acquisition, accounting for 43 per cent of notifications (table 8).

Table 8: Notified cases of S. Enteritidis, by country of infection, Victoria, 2004

Country/region	Number	Per cent
Indonesia	37	43
Other Asian countries	26	30
European countries	11	13
European and Asian countries	5	6
Africa	2	2
Middle East	3	4
No overseas travel identified	2	2
Total	86	100

Outbreak and other investigations

Three point source outbreaks of S. Typhimurium 9 (55 cases), one outbreak of S. Typhimurium 126 (six cases), one

Table 9: Salmonellosis outbreaks, by *Salmonella* type, setting and source, Victoria, 2004

Salmonella type	Setting	Source	Published
S. Typhimurium 9	Restaurant	Chicken dishes	VIDB vol. 7, Issue 2
S. Typhimurium 9	Community	Unknown	VIDB vol. 7, Issue 3
S. Typhimurium 9	Restaurant	Hollandaise Sauce	VIDB vol. 7, Issue 3
S. Typhimurium 126	Conference centre	Unknown	No
S. Typhimurium 170	Restaurant	Unknown	No
S. Typhimurium 12a	Conference centre	Gourmet rolls	No
S. Stanley	Boarding school	Unknown	VIDB vol. 7, Issue 3

VIDB = *Victorian infectious diseases bulletin*

outbreak of *S. Typhimurium* 170 (12 cases), one outbreak of *S. Typhimurium* 12a (15 cases) and one outbreak of *S. Stanley* (eight cases) occurred during 2004 (table 9). Summaries of some of these outbreaks can be found in the *Victorian Infectious Diseases Bulletin* online at <http://www.health.vic.gov.au/ideas/surveillance/bulletin.htm>

In addition, 21 separate cluster investigations of *Salmonella* serovars were conducted. In this report, a 'cluster' is defined as an unusual number of notifications of a particular serovar either in time and/or place that are not, at the outset of the investigation, clearly associated with a point source. In 2004 serovar clusters investigated included *S. Typhimurium* 9, *S. Typhimurium* 170 (four separate clusters), *S. Virchow* 8, *S. Typhimurium* 12, *S. Typhimurium* 197 (three separate clusters), *S. Cerro*, *S. Anatum*, *S. subsp I ser 16:1,v:-*, *S. Typhimurium* 126, *S. Oranienburg*, *S. Infantis*, *S. Typhimurium* 135, *S. Mississippi*, *S. Birkenhead*, *S. Typhimurium* 6 and *S. Agona*.

The *S. Typhimurium* 126 cluster investigation identified nine cases. Cases ranged in age from 11 months to 85 years and there were two males

and seven females. Cases had onsets of illness ranging from 20 January to 22 February. All cases were interviewed and six reported eating the same brand of organic free-range eggs. Three of these cases ate raw eggs and one case used eggs as an ingredient of vegetable patties. A sample of these left over uncooked patties was positive for *S. Typhimurium* 126. Of the remaining three cases, one reported eating organic eggs but could not recall the brand and two cases ate different brands of free-range eggs. Three weeks after the last case was notified, two additional cases of *S. Typhimurium* 126 were notified and interviewed. These cases were friends and shared a raw egg drink together the day prior to the onset of their symptoms on 16 March. These eggs were also free range but were not any of the brands eaten by the previous cases. The Department of Primary Industries inspected the farm on the basis of the epidemiological association with the initial six cases mentioned above. Samples of eggs (dirty and cracked) and drag swabs of the litter were taken during the visit but were negative for *Salmonella*.

A source of infection was not identified in the remainder of these cluster investigations.

Shigellosis

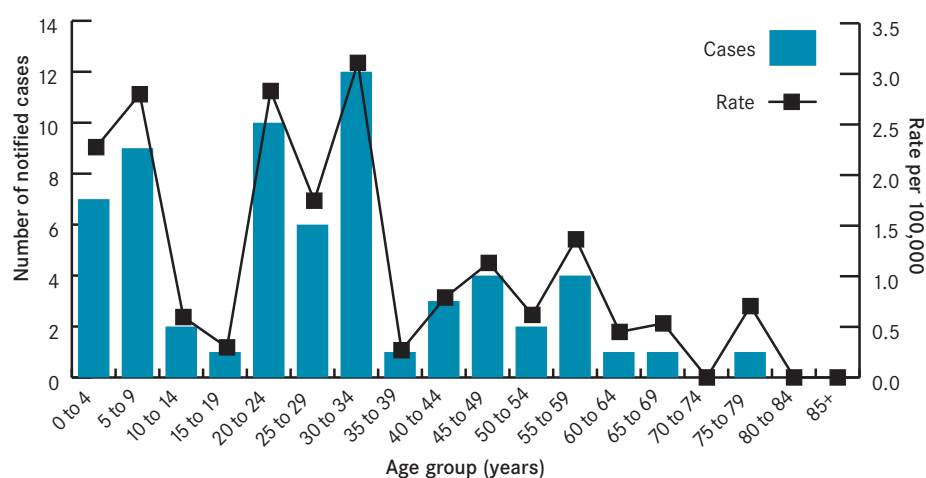
Summary of notifications

The department received notifications for 64 cases of shigellosis in 2004, an increase of 28 per cent from the number in 2003. Whilst the number of notified cases increased this year, *Shigella* notifications still remain low compared with previous years. Of the 64 cases, 27 (42 per cent) were for males and 37 (58 per cent) were for females. The median age of persons notified was 28 years (range: 1–77 years). Notification rates were highest among those aged 30 to 34 years (figure 17). The table below contains the species and type of *Shigella* (table 10). Notifications occurred sporadically throughout the year, and no seasonal patterns were identified.

Table 10: Notified cases of shigellosis, by species and type, Victoria, 2004

Species	Number
<i>Shigella sonnei</i> biotype g	29
<i>Shigella sonnei</i> biotype a	6
<i>Shigella flexneri</i> 1a	1
<i>Shigella flexneri</i> 1b	6
<i>Shigella flexneri</i> 2a	8
<i>Shigella flexneri</i> 2b	2
<i>Shigella flexneri</i> 3a	2
<i>Shigella flexneri</i> 4a	3
<i>Shigella flexneri</i> 6	1
<i>Shigella flexneri</i> 7	1
<i>Shigella flexneri</i> var y	1
<i>Shigella boydii</i> 1	1
<i>Shigella boydii</i> 2	1
<i>Shigella boydii</i> 8	1
<i>Shigella</i> untypable	1
Total	64

Figure 17: Notified cases of shigellosis, by age group and rate per 100,000 population, Victoria, 2004



Risk factors

Thirty-nine cases (61 per cent) were known to have acquired their infection overseas (table 11), and one case most likely acquired infection from close contact with a returned overseas traveller who had been ill. Of the remainder, two cases occurred through sexual contact and two cases were linked to the outbreak described below. For the remaining 11 cases, the source of infection was unknown because four could not be contacted and seven had no obvious risk factors.

Outbreak and other investigations

No outbreaks were identified.

Comment

Shigellae have a low infectious dose. Infection spreads when a person ingests bacteria through direct or indirect contact with the faeces of a human case. Awareness of the need for increased personal hygiene while travelling and at home will help prevent shigellosis.

Table 11: Notified cases of shigellosis, by risk factor, Victoria, 2004

Risk factor	Number
Overseas travel	
Southern/South East Asia	25
Pacific	4
Middle East	2
Europe	1
Central/South America	2
Africa	1
Multiple countries	4
Other risk factors	
Interstate travel	2
Unknown	11
Homosexual contact	2
Contact with a confirmed case	4
Contact with ill overseas traveller	4
Laboratory worker	2
Total	64

Typhoid and paratyphoid

Summary of notifications

The department received notifications for 17 cases of typhoid in 2004. The age range of cases was three to 80 years, and the male:female ratio was 1:1.1. Fourteen cases acquired their infection overseas with the highest proportion of cases having acquired their infection in India (table 12).

Twenty-four cases of paratyphoid were notified in 2004. The age range of cases was three to 63 years, and the male to female ratio was 1:3. All cases of paratyphoid acquired their infection overseas with the highest proportion of cases having acquired their infection in India (table 12).

Risk factors

Table 12 shows the country of acquisition for the cases. Three cases of typhoid reported no history of recent overseas travel. All cases were born overseas and they are likely to have been long-term carriers. These cases were born in Samoa, Albania and Romania.

Outbreak and other investigations

No outbreaks were identified.

Comment

Effective immunisation is available for travellers intending to travel to high-risk areas, however medical practitioners must remind their patients to exercise care in eating and drinking in endemic areas, regardless of immunisation status.

Table 12: Notified cases of typhoid and paratyphoid, by country of acquisition, Victoria, 2004

Country of acquisition	Typhoid	Paratyphoid
Indonesia	4	3
India	5	9
Pakistan	1	1
Philippines	1	0
Cambodia	1	6
Albania	1	0
Bangladesh	1	2
China	0	1
Thailand/ Cambodia/ Vietnam	0	1
India and Sri Lanka	0	1
Carrier	3	0
Total	17	24