MINISTRY OF HEALTH
MANATŪ HAUORA
newzealand.govt.nz

Campylobacteriosis

Epidemiology in New Zealand

Campylobacteriosis is the most frequently notified foodborne disease in New Zealand. There is marked seasonality in notifications, with the peak in spring and summer.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

An illness of variable severity with symptoms of abdominal pain, fever and diarrhoea, often with bloody stools.

Laboratory test for diagnosis

Laboratory confirmation requires isolation of *Campylobacter* spp. from a clinical specimen.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness that either is a contact of a confirmed case of the same disease or has had contact with the same common source – that is, is part of a common-source outbreak.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

Usually 2–5 days, range 1–10 days.

Mode of transmission

Most often by ingestion of contaminated food, typically undercooked poultry but also other meats or unpasteurised milk. Cross-contamination from raw meat to other foodstuffs may occur via hands, utensils, chopping boards or incorrect storage. In New Zealand, consumption of faecally contaminated water and direct contact with farm or domestic animals are other common routes of transmission. Person-to-person transmission is uncommon.

Period of communicability

Campylobacter spp. may be shed in the stool for several weeks after infection.

Notification procedure

Attending medical practitioners or laboratories must notify the local medical officer of health immediately of cases of probable or confirmed campylobacteriosis.

All health care workers are encouraged to talk with a medical officer of health about any suspected outbreaks or cases in people who are in high-risk occupations.

Management of case

Investigation

Obtain a food consumption history and details of water consumption and animal contact as well as details of occupation.

Investigate and obtain a more detailed history if there is an outbreak or if the case is in a high-risk occupation or attends an early childhood service.

Ensure symptomatic cases submit stool samples for testing.

Restriction

In a health care facility, only standard precautions are indicated in most cases. If the case is a diapered or incontinent child, apply contact precautions for the duration of illness. For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease.

Treatment

Fluid replacement is the mainstay of therapy. Antimicrobial agents have modest if any benefit on duration of symptoms and are only indicated if the infection is severe, the patient is immunocompromised or prompt termination of excretion of organisms is desired. Erythromycin is the preferred antimicrobial agent in New Zealand and generally clears the stool of *Campylobacter* spp. within 3 days. Other macrolides are equally effective. Ciprofloxacin or norfloxacin are alternatives but are associated with increasing resistance and are not recommended for children.

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission. Educate about hygiene.

Management of contacts

As set out in the exclusion and clearance criteria (Appendix 2: Enteric Disease), screening or restriction is not indicated for contacts of infectious cases or for people who have been exposed to the same food material suspected to be the source of infection.

If symptomatic, investigate and manage as a case until the stool test results are known.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food or water sources of infection only if there is a cluster of cases or an apparent epidemiological link.

If indicated, check water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008). Liaise with the local territorial authority staff to investigate potential water sources of infection.

Disinfection

Clean and disinfect surfaces and articles soiled with stool. For more details, refer to Appendix 1: Disinfection.

Health education

Educate the public about safe food preparation (see Appendix 3: Patient Information).

Hand-cleaning facilities should be available and used after contact with animals. Young children should be supervised during contact with animals and during hand cleaning. Food-related activities should be separated from areas that house animals. Domestic animals that have diarrhoea should be taken to a veterinarian for assessment and treatment.

If a water supply is involved, liaise with the local territorial authority to inform the public. Advise on the need to boil water.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Reporting

Ensure complete case information is entered into EpiSurv.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved. Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.

Cryptosporidiosis

Epidemiology in New Zealand

Cryptosporidiosis is caused by infection with the coccidian protozoan *Cryptosporidium parvum*.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

An acute illness that includes symptoms of diarrhoea (may be profuse and watery) and abdominal pain. The infection may be asymptomatic.

Laboratory test for diagnosis

Laboratory confirmation requires detection of *C. parvum* oocysts in a faecal specimen.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness that either is a contact of a confirmed case of the same disease or has had contact with the same common source – that is, is part of a common-source outbreak.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

Probably 1–12 days, with an average of 7 days.

Mode of transmission

Faecal-oral, including person to person, from infected animals or from contaminated water or food.

Period of communicability

Oocysts, the infectious stage, appear in the faeces at the start of illness and are excreted for several weeks after symptoms resolve.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case

Investigation

Obtain a history of contact with animals, consumption of untreated water, recreational water contact, exposure to faeces or contact with other symptomatic cases.

Investigate further if there is an outbreak, or if the case is in a high-risk occupation, such as a food handler or a staff member at an early childhood service, or attends an early childhood service (see 'Other control measures' below).

Ensure stool samples from people with diarrhoea have been tested for *Cryptosporidium* spp.

Restriction

In any health care facility, only standard precautions are indicated in most cases; if the case is a diapered or incontinent child, apply contact precautions for the duration of illness.

In the case of immunocompromised people, there is currently no available chemotherapeutic agent that can be used to treat the infection, hence infection prevention and control are of major importance to protect such people. For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease.

Cases should not use public swimming pools for 2 weeks after symptoms have resolved.

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission.

Educate about hygiene, especially hand cleaning.

Management of contacts

Definition

All people who have had close physical contact (for example, household) with a symptomatic case or who have been exposed to the same animal, water, food or other material suspected to be the source of infection.

Counselling

Advise all contacts to seek early medical attention if symptoms develop.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food, water or swimming pool sources of infection only if there is a cluster of cases or an apparent epidemiological link.

If indicated, check water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008).

If a water supply is involved, liaise with the local territorial authority to inform the public. Advise on the need to boil water.

If indicated, check swimming pools for compliance with the Standard for Pool Water Quality (NZS 5826:2010). Liaise with the local territorial authority staff to investigate potential water or pool sources of infection.

Disinfection

Clean and disinfect surfaces and articles soiled with stool. For more details, refer to Appendix 1: Disinfection.

Health education

Consider a media release and direct communication with relevant early childhood services, schools and health professionals to encourage prompt reporting of symptoms. In communicating with doctors, include recommendations regarding diagnosis and infection control.

Hand-cleaning facilities should be available and used after contact with animals. Young children should be supervised during contact with animals and during hand cleaning. Food-related activities should be separated from areas that house animals.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Educate the public about safe food preparation (see Appendix 3: Patient Information).

Reporting

Ensure complete case information is entered into EpiSurv.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved.

Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.

Giardiasis

Epidemiology in New Zealand

Children 1 to 4 years of age have the highest incidence rate for giardiasis in New Zealand.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz.

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

An illness characterised by diarrhoea, abdominal cramps, bloating, flatulence, nausea, weight loss and malabsorption. The infection may be asymptomatic.

Laboratory test for diagnosis

Laboratory confirmation requires at least one of the following:

- detection of giardia cysts or trophozoites in a specimen from the human intestinal tract
- detection of giardia antigen in faeces.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness that either is a contact of a confirmed case of the same disease or has had contact with the same common source – that is, is part of a common-source outbreak.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

Usually 3–25 days or longer; median 7–10 days.

Mode of transmission

Transmission occurs from ingestion of faecally contaminated food or drinking-water, swallowing recreational water (for example, swimming and wading pools, streams and lakes), exposure to faecally contaminated environmental surfaces, and person to person by the faecal-oral route.

Period of communicability

Throughout the entire period of infection, often months.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of cases of probable or confirmed giardiasis.

Management of case

Investigation

Investigate and obtain a risk exposure history. Obtain a history of any possible contacts and travel, recreational water contact and consumption of untreated water.

Ensure laboratory confirmation by stool testing has been attempted.

Restriction

In a health care facility, only standard precautions are indicated in most cases; if the case is a child who is diapered or incontinent, contact precautions should be applied for the duration of illness. For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease.

Cases should not use public swimming pools for 2 weeks after symptoms have resolved.

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission.

Educate about hygiene, especially hand cleaning.

Management of contacts

Definition

All people who have had close physical contact (for example, household) with a symptomatic case or who have been exposed to the same water, food or other material suspected to be the source of infection.

Investigation

Investigate contacts who are symptomatic.

Restriction

Contacts do not need to be excluded from work, school or other activities unless symptoms develop.

Prophylaxis

Not applicable.

Counselling

Advise all contacts of the incubation period and typical symptoms of giardiasis, and to seek early medical attention if symptoms develop.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food and water sources of infection only if there is a cluster of cases or an apparent epidemiological link.

If indicated, check water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008). Liaise with the local territorial authority staff to investigate potential water or pool sources of infection.

Disinfection

Clean areas and articles soiled with stools (for details, see Appendix 1: Disinfection).

Health education

Consider a media release and direct communication with relevant early childhood services, other institutions and health professionals to encourage prompt reporting of symptoms. In communications with doctors, include recommendations regarding diagnosis, treatment and infection control.

If a water supply is involved, liaise with the local territorial authority to inform the public. Advise on the need to boil water.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Educate the public about safe food preparation.

Hand-cleaning facilities should be available and used after contact with animals. Young children should be supervised during contact with animals and during hand cleaning. Food-related activities should be separated from areas that house animals. Domestic animals with diarrhoea should be taken to a veterinarian for assessment and treatment.

Reporting

Ensure complete case information is entered into EpiSurv.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved. Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

If an outbreak occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.

Hepatitis A

Epidemiology in New Zealand

The incidence of hepatitis A in New Zealand has decreased sharply since the 1960s, and currently about half the cases notified have a history of overseas travel.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz.

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

Following a prodrome of fever, malaise, anorexia, nausea or abdominal discomfort, there is jaundice, elevated serum aminotransferase levels and sometimes an enlarged tender liver. Children are often asymptomatic and occasionally present with atypical symptoms, including diarrhoea, cough, coryza or arthralgia. Jaundice is very unusual in children younger than 4 years, and 90 percent of cases in the 4–6 years age group are anicteric.

Laboratory test for diagnosis

Laboratory confirmation requires positive hepatitis A-specific IgM in serum (in the absence of recent vaccination).

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness that is epidemiologically linked to a confirmed case.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

15–50 days, commonly 28–30 days.

Mode of transmission

Mainly person to person by the faecal-oral route.

Common-source outbreaks have been reported from contaminated water or food; foodborne outbreaks have been linked to an infected food handler, raw or undercooked shellfish harvested from contaminated water, and contaminated produce such as lettuce or berries. Transmission by injected drug use is occasionally reported. Blood or blood-product transfusion related transmission (associated with a viraemic donor) is rare. Hepatitis A virus remains viable in the environment for long periods.

Period of communicability

Maximum infectivity is during the 1–2 weeks before and the first few days after the onset of jaundice. Most cases are probably non-infectious after the first week of jaundice although prolonged viral excretion (up to 6 months) has been documented in infants and children.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case

Investigation

Obtain a history of travel (including overseas visitors within the incubation period), prior vaccination, possible contacts, consumption of shellfish or other suspect food (for example, overseas food), and blood or blood-product transfusion. Injecting drug users and men who have sex with men may be at higher risk of infection.

Ensure laboratory confirmation by serology has been attempted.

Restriction

In health care facilities, only standard precautions are indicated for the majority of patients with hepatitis A. Infants, young children and incontinent patients require contact isolation precautions until at least 1 week after the onset of jaundice (or symptoms) or for the duration of hospitalisation.

Patients in high-risk groups (see the exclusion and clearance criteria in Appendix 2: Enteric Disease) should stay away from work or school for at least 1 week from onset of

jaundice or symptoms. In the case of schoolchildren, discuss with the school about availability of hand-cleaning facilities.

Treatment

Supportive. The disease is often asymptomatic in children but is fulminant in about 1 percent of adult cases.

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission.

Educate about hand hygiene and advise not to prepare or handle food for others until no longer considered infectious.

Management of contacts

Identify contacts (household, sexual and other) for counselling about immunisation and/or immunoglobulin as appropriate. Contacts should be advised about possible symptoms, incubation period and the need to seek medical attention if unwell within the maximum incubation period of 50 days.

Definition

1. Contact with a case during the latter half of the incubation period and until 1 week after onset of jaundice, including:
    a. all household and sexual contacts
    b. staff and children in close contact with the case at an early childhood service.

    (Assessment of 'close contact' in an early childhood service will take into consideration: involvement with nappy changing, toilet hygiene practices and whether there has been more than one case associated with the service.)
2. Those exposed to hepatitis A-contaminated food or water in a common-source outbreak.
3. Exposure to potentially contaminated food via an infected food handler (refer to 'Special situations' below).

Investigation

Laboratory screening of contacts is not usually indicated (see comment under 'Vaccination' below). Consider blood tests for any contact with compatible symptoms.

Restriction

Nil unless symptoms develop.

Prophylaxis

There is reasonably broad international consensus that vaccine is effective for preventing secondary cases in healthy contacts, and it now tends to be the preferred option as opposed to immunoglobulin. Immunoglobulin may have higher efficacy, but this needs to be balanced against the advantages of vaccination, including ease of administration, duration of effect and the lack of interaction with live vaccines.

Vaccination

Age-appropriate vaccine is recommended for all close contacts over the age of 1 year. If time allows, consider pre-vaccine serology if there is a history or likelihood of previous hepatitis A vaccination or infection (for example, previous residence in an endemic country). Post-exposure prophylaxis (PEP) with vaccine should be offered to contacts as soon as possible, and within 2 weeks of last exposure to an infectious case. The efficacy of vaccine when administered > 2 weeks after exposure has not been established.

Immunoglobulin

Where vaccine is contraindicated (or not immediately available), normal human immunoglobulin (NHIG) may be offered to a close contact who may have a reduced response to vaccine or has risk factors for severe disease. The dose of NHIG is 0.03 mL/kg given by intramuscular injection. PEP with NHIG should be offered to contacts as soon as possible, and within 2 weeks of last exposure to an infectious case. NHIG is available from the New Zealand Blood Service.

Close contacts under 1 year of age will require NHIG.

For further information refer to the medicine data sheets or the New Zealand Blood Service website (www.nzblood.co.nz).

Special situations

Early childhood service and other institutional outbreaks

If an outbreak occurs in an early childhood service, vaccination (and/or immunoglobulin if appropriate) may be indicated for all previously unimmunised staff and children at the service and unimmunised new staff and children for up to 6 weeks after the last case has been identified, including cases in the household of attendees. The number of infected cases should determine the extent of intervention.

Vaccination and/or immunoglobulin may also be indicated for adults and children at a school, hospital or custodial-care institution where an outbreak of hepatitis A is occurring. For sporadic cases in hospitals, schools or work settings, PEP is not routinely indicated, but careful hygiene practices should be maintained.

Contacts of an infected food handler

If a food handler is diagnosed with hepatitis A, vaccine (or immunoglobulin) should be given to other food handlers at the same premises. Vaccination of patrons is usually not needed but can be considered under the following conditions:

1. while infectious, the case directly handled uncooked foods or foods after cooking, and had diarrhoea or poor hygiene practices
2. vaccine (or immunoglobulin) may be given within 2 weeks of exposure.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food and water sources of infection only if there is a cluster of cases or an apparent epidemiological link.

If indicated, check water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008). Liaise with the local territorial authority staff to investigate potential water sources of infection.

Disinfection

Clean and disinfect surfaces and articles soiled with stools. For further details, refer to Appendix 1: Disinfection.

Health education

If there is a cluster of cases, consider a media release and direct communication with local parents, early childhood services, schools and health professionals to encourage early reporting of symptoms. In communications with doctors, include recommendations regarding diagnosis, treatment and infection control.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Reporting

Ensure complete case information is entered into EpiSurv.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved. Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.

ACIP. 2007. Update: Prevention of hepatitis A after exposure to hepatitis A virus and in international travellers. Updated Recommendations of the Advisory Committee on Immunization Practices. *Morbidity and Mortality Weekly Report* 56(41): 1080–4.

Crowcroft NS, Walsh B, Davison KL, et al. 2001. Guidelines for the control of hepatitis A virus infection. *Communicable Disease and Public Health* 4: 213–27.

Health Protection Agency, UK. 2007. *Immunoglobulin Handbook*, Chapter 1 – Hepatitis A. URL: www.hpa.org.uk.

National Advisory Committee on Immunisation. 2000. Supplementary statement on hepatitis a vaccine. *Canada Communicable Disease Report* 26(ACS-4).

Sagliocca L, Amoroso P, Stroffolini T, et al. 1999. Efficacy of hepatitis A vaccine in prevention of secondary hepatitis A infection: a randomised trial. *Lancet* 353: 340–1.

Victor JC, Monto AS, Surdina TY, et al. 2007. Hepatitis A vaccine versus immune globulin for postexposure prophylaxis. *New England Journal of Medicine* 357(17): 1685–94.

Salmonellosis

Epidemiology in New Zealand

Note: There are separate chapters for typhoid and paratyphoid fevers.

Salmonellosis is a common foodborne and water disease in New Zealand, and outbreaks are common. The highest rate of disease is reported in young children.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

Salmonellosis presents as gastroenteritis, with abdominal pains, diarrhoea (occasionally bloody), fever, nausea and vomiting. Asymptomatic infections may occur.

Laboratory test for diagnosis

Laboratory confirmation requires isolation of *Salmonella* species from a clinical specimen.

All isolates should be referred to the Enteric Reference Laboratory at ESR for further characterisation.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness that either is a contact of a confirmed case of the same disease or has had contact with the same common source – that is, is part of a common-source outbreak.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

6–72 hours, commonly 12–36 hours.

Mode of transmission

Ingestion of organisms in contaminated foodstuffs, including meat products and imported foodstuffs. Many animals and birds are asymptomatic carriers of *Salmonella* spp. Undercooking of contaminated foodstuffs and cross-contamination (especially of raw fruits and vegetables) in the kitchen are thought to be responsible for many cases. Ingestion of faecally contaminated water causes frequent cases in New Zealand.

Infection may be a result of direct contact with an infected farm or domestic animal. Person-to-person spread occurs, often from infants and stool-incontinent adults. Commonly reported risk factors identified in New Zealand cases include consuming food from retail premises, contact with animals (farm animals and pets, including fish and reptiles), consumption of untreated water and overseas travel. Recreational water contact and contact with symptomatic people during the incubation period are less commonly reported.

Period of communicability

Variable; typically several days to several weeks. Approximately 1 percent of infected adults and 5 percent of infected children under 5 years of age excrete *Salmonella* spp. for more than 1 year.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of probable or confirmed cases.

All health care workers are encouraged to talk with a medical officer of health about any suspected outbreaks of acute gastroenteritis or cases in people working in high-risk occupations.

Management of case

Investigation

Obtain a food history and details of water consumption, animal contact and travel as well as details of occupation.

Investigate and obtain a more detailed history (using the ESR salmonella questionnaire) if there is an outbreak or the case is in a high-risk occupation or attends an early childhood service.

Ensure symptomatic cases submit stool samples for testing.

Restriction

In a health care facility, only standard precautions are indicated in most cases; if the case is a diapered or incontinent child, apply contact precautions for the duration of the illness. For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease.

Counselling

Advise the case and/or caregivers of the nature of the infection and its mode of transmission. Educate about hygiene, especially hand cleaning.

Management of contacts

Household contacts who are food handlers should supply one negative stool.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food or water sources of infection only if there is a cluster of cases or an apparent epidemiological link.

If indicated, check water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008). If a water supply is involved, liaise with the local territorial authority to inform the public. Advise on the need to boil water.

Disinfection

Clean and disinfect surfaces and articles soiled with stool. For further details, refer to Appendix 1: Disinfection.

Health education

Educate the public about safe food preparation (see Appendix 3: Patient Information).

Hand-cleaning facilities should be available and used after contact with animals. Young children should be supervised during contact with animals and during hand cleaning. Food-related activities should be separated from areas that house animals. Domestic animals with diarrhoea should be taken to a veterinarian for assessment and treatment.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Reporting

Ensure complete case information is entered into EpiSurv.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved. Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.

Shigellosis

Epidemiology in New Zealand

Outbreaks of shigellosis in New Zealand are often caused by person-to-person transmission. Many cases of shigellosis are the result of overseas travel, but occasional outbreaks occur.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz.

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

Acute diarrhoea with fever, abdominal cramps, blood or mucus in the stools and a high secondary attack rate among contacts.

Laboratory test for diagnosis

Laboratory confirmation requires isolation of any *Shigella* spp. from a stool sample or rectal swab and confirmation of genus.

All isolates should be referred to the Enteric Reference Laboratory at ESR for further characterisation.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness that is either epidemiologically linked to a confirmed case or has had contact with the same common source – that is, is part of a common-source outbreak.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

Range of 12 hours to 1 week; usually 1–3 days.

Mode of transmission

Direct or indirect faecal-oral transmission. Food or water may become contaminated. The infective dose can be as low as 10–100 organisms.

Period of communicability

Up to 4 weeks after infection. Asymptomatic carriage may also occur. Faecal shedding rarely persists for months. Appropriate antimicrobial treatment reduces the duration of carriage to a few days.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case

Investigation

Obtain a history of travel, including a food history and water exposure, as well as a list of possible contacts. Ensure laboratory confirmation by stool or rectal swab culture has been attempted.

Restriction

In a health care facility, only standard precautions are indicated in most cases; if the case is diapered or incontinent, apply contact precautions for the duration of illness. For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease.

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission. Educate about hand and food hygiene.

Management of contacts

Identify contacts for investigation and counselling as appropriate.

Definition

All those with close (for example, household) contact with a case during their illness or the subsequent period of communicability or who have been exposed to the same contaminated food or water in a common-source outbreak.

Investigation

All close (for example, household) contacts in one of the high-risk groups (1–4, see the exclusion and clearance criteria in Apppendix 2: Enteric Disease) should be asked to provide clearance of one negative faecal sample.

Restriction

Nil, unless symptomatic.

Prophylaxis

Nil.

Counselling

Advise all contacts of the incubation period and typical symptoms of shigellosis, and to seek early medical attention if symptoms develop.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food or water sources of infection only if there is a cluster of cases or an apparent epidemiological link.

If indicated, check the water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008).

Disinfection

Clean and disinfect surfaces and articles soiled with stools. For further details, refer to Appendix 1: Disinfection.

Health education

In an outbreak, consider a media release and direct communication with local parents, early childhood services, schools and health professionals to encourage prompt reporting of symptoms. In communications with doctors, include recommendations regarding diagnosis, treatment and infection control.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Educate the public about safe food preparation (see Appendix 3: Patient Information).

Reporting

Ensure complete case information is entered into EpiSurv.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved. Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.

Verotoxin- or Shiga toxin-producing *Escherichia coli* (VTEC/STEC)

Epidemiology in New Zealand

Since the first New Zealand case was detected in 1993, the incidence of verotoxin- or Shiga toxin-producing *Escherichia coli* (VTEC/STEC) has gradually increased.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz.

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

Diarrhoea resulting from infection with VTEC/STEC may range from mild, watery and non-bloody to almost pure bloody diarrhoea with abdominal cramping. The disease is distinguishable from other causes of gastroenteritis by its high incidence of bloody diarrhoea (profuse rectal bleeding without fever sometimes clouds the diagnosis), severity (approximately 40 percent of cases are hospitalised) and frequency of complications.

Haemolytic uraemic syndrome (HUS) complicates 8–10 percent of VTEC/STEC infections in children; this syndrome includes haemolytic anaemia, thrombocytopenia and acute renal failure. Of children with HUS, 12–30 percent will have severe sequelae, including renal and cerebral impairment. Elderly patients with VTEC infections may suffer thrombotic thrombocytopenic purpura (TTP), which is similar to HUS but with greater neurological involvement.

Laboratory tests for diagnosis

Laboratory confirmation requires evidence of Shiga toxin, which comprises either:

- isolation of Shiga toxin-producing (verotoxin) *Escherichia coli*, OR
- detection of the genes associated with the production of Shiga toxin in *E. coli*.

All isolates should be referred to the Enteric Reference Laboratory at ESR for further characterisation.

Isolates producing Shiga toxin 2 (Stx2) are more likely to cause serious human disease than isolates producing Shiga toxin 1 (Stx1) or both toxins together. Any positive toxin test should be reported as a confirmed case of VTEC/STEC.

Note: The eae and enterohaemolysin (hlyA) genes are accessory virulence factors strongly associated with enterohaemorrhagic *E. coli* (EHEC); however, finding these genes does not constitute a positive toxin test.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** Not applicable.
- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition. (Note: Asymptomatic people with positive laboratory results should be recorded under this category.)

Spread of infection

Incubation period

2–10 days; median 2–3 days.

Mode of transmission

In the majority of cases, by ingestion of food contaminated by ruminant faeces; outbreaks have been linked to contaminated hamburger and other meat products, unpasteurised milk, and produce (including melons, lettuce, coleslaw, apple cider and alfalfa sprouts). Outbreaks have also been linked to faeces-contaminated drinking and swimming pool water, direct contact with animals and person-to-person spread in households, early childhood services and custodial institutions.

Period of communicability

Faecal shedding persists for up to 1 week in adults and up to 3 weeks in children.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Separate hospital-based surveillance of paediatric admissions of HUS is provided through the New Zealand Paediatric Surveillance Unit. This surveillance service does not involve medical officers of health.

Management of case

Investigation

In consultation with the attending medical practitioner, obtain a history of ingestion of meat products, exposure to recreational water or untreated water, contact with ruminant animals or their faeces, possible human contacts and travel. Ensure laboratory confirmation by stool culture or rectal swab has been attempted. Inform the laboratory that VTEC is suspected.

Restriction

In a health care facility, only standard precautions are indicated in most cases; if the case is diapered or incontinent, apply contact precautions for the duration of the illness. For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease .

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission. Educate about hygiene, especially hand cleaning.

Management of contacts

Identify contacts for investigation, restriction and counselling as appropriate.

Definition

All those with close (for example, household) contact with a case during the period of communicability or who have been exposed to the same contaminated food, water or other source in a common-source outbreak.

Investigation

For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease.

Prophylaxis

Nil.

Counselling

Advise all contacts of the incubation period and typical symptoms of VTEC/STEC infection, and to seek early medical attention if symptoms develop. Educate about hygiene, especially hand cleaning.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food, water or animal sources of infection only if there is a cluster of cases or an apparent epidemiological link (for example, ground beef consumption).

If indicated, check the water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008).

Disinfection

Clean and disinfect surfaces and articles soiled with stool. For further details, refer to Appendix 1: Disinfection.

Health education

Hand-cleaning facilities should be available and used after contact with animals. Young children should be supervised during contact with animals and during hand cleaning. Food-related activities should be separated from areas that house animals. Domestic animals with diarrhoea should be taken to a veterinarian for assessment and treatment.

If a water supply is involved, liaise with the local territorial authority to inform the public. Advise on the need to boil water.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Reporting

Ensure complete case information is entered into EpiSurv.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved. Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.

Yersiniosis

Epidemiology in New Zealand

The vast majority of cases of yersiniosis in New Zealand are caused by *Yersinia enterocolitica* biotype 4 (commonly found in pigs in New Zealand). *Y. enterocolitica* biotype 3 (commonly found in cattle in New Zealand) and *Y. pseudotuberculosis* account for most of the remaining cases.

More detailed epidemiological information is available on the Institute of Environmental Science and Research (ESR) surveillance website at www.surv.esr.cri.nz.

Further information on foodborne illness is available at www.foodsafety.govt.nz and www.mpi.govt.nz.

Case definition

Clinical description

In children under 5 years old, *Y. enterocolitica* infection typically causes diarrhoea, vomiting, fever and occasionally abdominal pain. In contrast, older children and adults are more likely to experience abdominal pain as the prominent symptom. Bacteraemia and sepsis may occur in immunocompromised individuals. *Y. pseudotuberculosis* is more likely to cause mesenteric adenitis and septicaemia than *Y. enterocolitica*.

Laboratory test for diagnosis

Laboratory confirmation requires at least one of the following:

- isolation of Yersinia enterocolitica or Y. pseudotuberculosis from blood or faeces
- detection of circulating antigen by ELISA or agglutination test.

All isolates should be sent to the Enteric Reference Laboratory at ESR for further characterisation.

Case classification

- **Under investigation:** A case that has been notified, but information is not yet available to classify it as probable or confirmed.
- **Probable:** A clinically compatible illness that is epidemiologically linked to a confirmed case or has had contact with the same common source – that is, is part of a common-source outbreak.

- **Confirmed:** A clinically compatible illness that is laboratory confirmed.
- **Not a case:** A case that has been investigated and subsequently found not to meet the case definition.

Spread of infection

Incubation period

From 3–7 days, generally under 10 days.

Mode of transmission

Mostly through ingestion of contaminated food, including pork and pork products, dairy products (especially unpasteurised milk), fruit, vegetables and tofu.

Although optimal growth is seen at 28–29°C, *Y. enterocolitica* also grows well in a refrigerator (4°C) and survives freezing.

Yersiniosis is also associated in New Zealand with ingestion of untreated water, direct contact with an infected animal and person-to-person spread. Person-to-person transmission in a hospital has been reported. *Yersinia* spp. have rarely been transmitted from asymptomatic patients by blood transfusion.

Y. paratuberculosis is not transmitted through contaminated food. It is found in deer in New Zealand.

Period of communicability

Faecal shedding generally persists for 2–3 weeks but can be prolonged (months) in both children and adults.

Notification procedure

Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.

Management of case

Investigation

Obtain a food history, details of ingestion of untreated water, contact with animals, possible human contacts and travel.

Restriction

In a health care facility, only standard precautions are indicated in most cases; if the case is a diapered or incontinent child, apply contact precautions for the duration of

illness. For further details, refer to the exclusion and clearance criteria in Appendix 2: Enteric Disease.

Counselling

Advise the case and their caregivers of the nature of the infection and its mode of transmission. Educate about hygiene, especially hand cleaning.

Management of contacts

Definition

All those with unprotected close contact with a case during the period of communicability or who have been exposed to the same contaminated food, water or other source in a common-source outbreak.

Investigation

Test for asymptomatic infection only in an outbreak.

Counselling

Advise all contacts of the incubation period and typical symptoms of yersiniosis, and to seek early medical attention if symptoms develop.

Other control measures

Identification of source

Check for other cases in the community. Investigate potential food or water sources of infection only if there is a cluster of cases or an apparent epidemiological link.

If indicated, check the water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008).

Disinfection

Clean and disinfect surfaces and articles soiled with stool. For further details, refer to Appendix 1: Disinfection.

Health education

Educate the public about safe food preparation (see Appendix 3: Patient Information).

Hand-cleaning facilities should be available and used after contact with animals. Young children should be supervised during contact with animals and during hand cleaning. Food-related activities should be separated from areas that house animals. Domestic animals with diarrhoea should be taken to a veterinarian for assessment and treatment.

If a water supply is involved, liaise with the local territorial authority to inform the public. Advise on the need to boil water.

In early childhood services or other institutional situations, ensure satisfactory facilities and practices regarding hand cleaning; nappy changing; toilet use and toilet training; preparation and handling of food; and cleaning of sleeping areas, toys and other surfaces.

Reporting

Ensure complete case information is entered into EpiSurv.

Liaise with the environmental health officer of the local territorial authority where food premises are thought to be involved. Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

If a cluster of cases occurs, contact the Ministry of Health Communicable Diseases Team and outbreak liaison staff at ESR, and complete the Outbreak Report Form.

References and further information

Ministry of Health. 2008. *Drinking-water Standards for New Zealand 2005 (Revised 2008)*. Wellington: Ministry of Health.