

SHIGELLOSIS PROTOCOL

Based on the MoH Communicable Diseases Control Manual 2012-December 2017 Update¹

Associated Documents

Case Report Form:
Y:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\Shigellosis\FormsStdLettersQuest\CaseReportForm_Enteric_Dec2017.pdf

Fact sheet:
Manatū Hauora | Ministry of Health
<https://www.health.govt.nz/our-work/diseases-and-conditions/communicable-disease-control-manual/shigellosis>

The Illness^{2,3}

Shigella species are a common cause of bacterial diarrhoea (and dysentery) worldwide, especially in developing countries. They cause an estimated 1 million deaths and 165 million cases annually. *Shigella* organisms can survive transit through the stomach since they are less susceptible to acid than other bacteria and for this reason, as few as 10 - 100 organisms can cause disease. Humans are the only natural reservoir for disease. There are four species: *S. sonnei*, *S. flexneri*, *S. dysenteriae* and *S. boydii*. In developing countries, both faecal-oral spread and contamination of common food and water supplies are important mechanisms of transmission. In developed countries *Shigella* may result in institutional and food borne outbreaks and amongst men who have sex with men.

Infection with *Shigella* species (particularly *S. dysenteriae*) may be associated with the following extra-gastrointestinal complications:

- ◊ bacteraemia
- ◊ haemolytic uremic syndrome (mortality rate of greater than 50%)
- ◊ metabolic disturbances
- ◊ convulsions
- ◊ encephalopathy (up to 40% of children hospitalised with shigellosis)
- ◊ reactive arthritis.

Epidemiology in New Zealand^{1,4}

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.

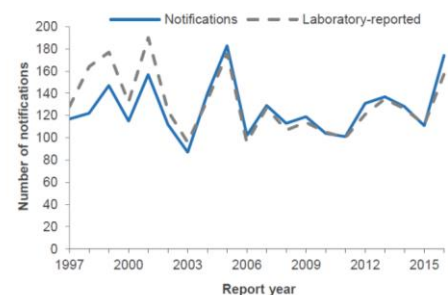
Shigella comprises 4 species or serogroups: group A (*S. dysenteriae*), group B (*S. flexneri*), group C (*S. boydii*) and group D (*S. sonnei*). *S. dysenteriae* type 1 can spread in epidemics and is associated with serious disease and complications; *S. flexneri* can cause reactive arthritis. By contrast, *S. sonnei* is generally associated with mild illness.

In 2016, 174 cases of shigellosis were notified compared with 111 in 2015. The 2016 notification rate (3.7 per 100,000) was a significant increase from the 2015 rate (2.4 per 100,000). The graph shows total cases by year between 1997 and 2016.

2016 data

- ◊ Age groups: 1–4 years, 60-49 years
- ◊ Regions: Waitemata, Counties Manukau and Auckland DHBs, had the highest rates.
- ◊ Ethnicity: Pacific peoples
- ◊ Hospitalisation: 30%
- ◊ Risk factors: Travelling overseas (61%) (India, Samoa and Tonga).
- ◊ Commonest species: *S. sonnei* (55%) and *S. flexneri* (41%).
- ◊ Two outbreaks (13 cases) were reported in 2016.

NZ shigellosis notifications and laboratory reported cases year by year, 1997-2016



| | |
|--------------------------------------|--|
| | <p>CASE DEFINITION Clinical description Acute diarrhoea with fever, abdominal cramps, blood or mucus in the stools and a high secondary attack rate among contacts.</p> <p>Reservoir Humans.</p> <p>Incubation period: 12 hours to 1 week; usually 1–3 days.</p> <p>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.</p> <p>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.</p> <p>Prevention: Prevention of shigellosis is achieved by the following:</p> <ul style="list-style-type: none"> - access to safe drinking water, chlorination of unreliable water sources, strict hand washing (especially by food handlers) and refrigeration of food and proper cooking, - implementation of public health policies and procedures for notified individuals and outbreaks, - implementation of infection control principles in health care and high-risk settings, <p>Antibiotic prophylaxis is restricted to certain individuals at risk of severe disease. There is currently no effective vaccine against <i>Shigella</i>.⁵</p> |
| <p>Notification Procedure</p> | |
| | <p>Attending medical practitioners or laboratories must immediately notify the local medical officer of health of suspected cases. Notification should not await confirmation.</p> <p>Under investigation: A case that has been notified, but information is not yet available to classify it as probable or confirmed.</p> <p>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.</p> <p>Confirmed: A clinically compatible illness that is laboratory confirmed.</p> <p>Not a case: A case that has been investigated and subsequently found not to meet the case definition.</p> |
| <p>Laboratory Testing</p> | |
| | <p>Laboratory definitive evidence for a confirmed case requires isolation of any <i>Shigella</i> spp. from a stool sample or rectal swab and confirmation of genus by a reference laboratory. While nucleic acid testing may be used for screening, a positive nucleic acid test does not meet the criteria for laboratory confirmation.</p> <p>All isolates should be referred to the Enteric Reference Laboratory at ESR for further characterisation.</p> |
| <p>Management of Case</p> | |
| | <p>Initial notification The initial laboratory notification of possible shigellosis now arrives as a report of a positive result to a faecal bacteria PCR screen, indicating that shigella AND/OR enteroinvasive E coli (EIEC) has been detected. Following this initial positive PCR result the laboratory will proceed to culture the specimen to determine whether shigella is present. Until the culture result is available public health action is guided by risk factor information; see the flow chart in Appendix 4.</p> <p>Investigation Obtain a history of travel, a food history and history of water exposure, as well as a list of possible contacts.</p> |

- Administer questionnaire by telephone and post out letter and disease information within 4 hours. *{Note: The letter accompanying the disease information mentions that if the case is a child, both the letter and disease information are to accompany the child if he/she stays in another household, until a clearance is given.}* If notified outside of office hours, contact the MOH.
- Ensure laboratory confirmation by stool or rectal swab culture has been attempted.
- Investigate and obtain a more detailed history if there is an outbreak and ensure symptomatic persons are tested for *Shigella*.
- Liaise with the environmental health officer of the local territorial authority where a food premise is thought to be involved.
- Liaise with the Ministry for Primary Industries if a contaminated commercial food source is thought to be involved.

Outbreak

If an outbreak is suspected, contact the MOH and refer to;

- ◊ Te Mana Ora Outbreak Response Procedure
https://cdhbintranet.cdhb.health.nz/communitypublichealth/cphpoliciesandprocedures/SitePages/CD_Outbreaks.aspx
- ◊ Organise faecal screening (through ESR) of symptomatic persons involved in the event or associated with the facility. These persons are to be managed as cases until results are known.

Restriction and Clearance

- In a health care facility, only standard precautions are indicated in most cases:
<http://www.cdhb.health.nz/Hospitals-Services/Health-Professionals/CDHB-Policies/Infection-Prevention-Control-Manual/Documents/Standard%20Precautions.pdf>
- if the case is in nappies or incontinent, apply contact precautions for the duration of illness. For further details, refer to the exclusion and clearance criteria in Table 1 and for more details, Appendix 2 in this protocol.

Table 1.⁶ Exclusion and clearance criteria for people at increased risk of transmitting an infection to others*

| Pathogen | Exclusion | Clearance | Contacts |
|--|--|---|--|
| <i>S. Sonnei</i> | <i>S. Sonnei</i> - until symptom free for 48 hours | None required | No action |
| <i>S.Boydii, Dysenteriae, and Flexneri</i> | <i>S.Boydii, Dysenteriae, and Flexneri</i> cases in groups 1,2,3,4 require clearance | 1, 2, 3, 4 (below) Exclude until symptom free for 48 hours and two consecutive negative stools at least 48 hours apart | 1, 2, 3, 4 (below) Exclude until one negative faecal specimen has been provided |

* **Cases of most enteric disease should be considered infectious and should remain off work /school /preschool until 48 hours after symptoms have ceased.** Certain individuals pose a greater risk of spreading infection and additional restriction/exclusion criteria may apply.

NOTE: The Health (Infectious and Notifiable Diseases) Regulations 2016 do not contain any exclusionary powers for people at increased risk of transmitting an infection to others (groups 1-4 following). Instead, the medical officers of health can resort to broader powers in Part 3A of the Health Act 1956, which include directions to cases and contacts to remain at home until no longer infectious.

1. people whose work involves preparing or serving unwrapped food to be served raw or not subject to further heating (including visitors or contractors who could potentially affect food safety)
2. staff, inpatients and residents of health care, residential care, social care or early childhood facilities whose activities increase risk of transferring infection via the faecal-oral route

- 3. children under the age of 5 attending early childhood services/groups
 - 4. other adults or children at higher risk of spreading the infection due to illness or disability.
- If personal hygiene habits and hand washing facilities a concern, discuss with MOH.
 - For further details, refer to Appendix 2 of this protocol and reference 6.

Treatment

- Fluid and electrolyte therapy.
- Antibiotic treatment to be guided by sensitivities.³ Although shigellosis can cause haemolytic uremic syndrome in some children, it is not due to the antibiotic treatment (unlike VTEC).⁵

Counselling

- Advise the case and their caregivers of the nature of the infection and its mode of transmission. If case is a child, ask if he/she stays in any household other than that given at the time of notification and if so, ensure advice accompanies the child when he/she moves.
- A fact sheet is available:
Manatū Hauora | Ministry of Health
<https://www.health.govt.nz/our-work/diseases-and-conditions/communicable-disease-control-manual/shigellosis>
- Educate about hygiene especially hand hygiene.

Management of Contacts

Definition of a Contact

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

Investigation

Identify contacts for investigation, possible restriction (and clearance) and counselling as appropriate.

Restriction and Clearance

- Nil if asymptomatic and not in a high-risk group.
- Symptomatic high-risk contacts are to be treated as a case and must remain off work/school/preschool etc. while awaiting culture results of faecal specimens.
- For exclusion and clearance criteria for contacts from an early childhood centre see Tables 1-3.

Table 2[‡] Exclusion and clearance criteria of an asymptomatic high-risk contact (the child/adult attends an early childcare centre) of a household case

| Contact | Action | Specimen result | Action |
|----------------|------------------|-----------------|------------------------|
| Adult | Screen | Positive | As per type - Table 1 |
| | | Negative | No further restriction |
| Child <5 years | Exclude + screen | Positive | As per type - Table 1 |
| | | Negative | No further restriction |

Table 3[‡] Exclusion and clearance criteria of an asymptomatic early childcare centre contact of an early childcare centre case

| Contact | Action | Specimen result | Action |
|----------------|---------------------|-----------------|------------------------|
| Adult | Screen | Positive | As per type - Table 1 |
| | | Negative | No further restriction |
| Child <5 years | Screen ^Ω | Positive | As per type - Table 1 |
| | | Negative | No further restriction |

[‡] For further details of the arguments for the above amendments see reference 7.

^Ω In this situation the risk of transmission is essentially reduced by the exclusion of the case and any symptomatic contacts, and exclusion of asymptomatic contacts may affect a significant proportion of attendees unnecessarily. Furthermore, not excluding asymptomatic children may be beneficial in that it is likely to reduce their attendance at other ECCs while potentially infectious.

Prophylaxis

Usually nil. Antibiotic prophylaxis is restricted to certain individuals at risk of severe disease.⁵

Counselling

- Advise all contacts of the incubation period and typical symptoms of shigellosis and to seek medical attention promptly if symptoms develop.
- A fact sheet is available:
Manatū Hauora | Ministry of Health
<https://www.health.govt.nz/our-work/diseases-and-conditions/communicable-disease-control-manual/shigellosis>
- If symptomatic, contact is to consult GP and have a faecal test. Manage as a case until the result is 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 the water supply for microbiological contamination and compliance with the latest New Zealand drinking-water standards (Ministry of Health 2008).⁸

Disinfection

Clean and disinfect surfaces and articles soiled with faecal material. For more details, see Appendix 1 in this protocol and reference 9.

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 situation, 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 in this protocol and reference 10).

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.
- If an outbreak, write report for Outbreak Report File:
[K:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Shigellosis\Outbreaks\](K:\CFS\ProtectionTeam\FinalDocs\NotifiableConditions\Shigellosis\Outbreaks)
- File.

Appendix 1

Extract from the MoH Communicable Disease Control Manual 2012 - December 2017: Appendix1: Disinfection⁹

Disinfection and cleaning the environment

Diseases that are notifiable have public health implications. Therefore, decontamination of the environment is recommended when cross-infection from the source is possible. Disinfection is also indicated for contamination with y resistant bacteria.

Concurrent disinfection is the application of disinfection measures as soon as possible after the discharge of infectious material from the body of an infected person, or after articles have been soiled with such infectious discharges.

Personal protective equipment (PPE) must be used during environmental disinfection to prevent self-contamination.

Procedures

Disposable items: Any items that can be disposed of should be categorised as in NZS 4304:2002 New Zealand Waste Standard and disposed of.

Solid surfaces and/or equipment (including children’s toys): Before disinfection, solid surfaces and/or equipment should be cleaned with detergent and dried. Before disinfection chemicals are applied, it should be established that they are fit for purpose a clear process on how to use them and manufacturer’s recommendations are followed.

Source: Ministry of Health. 2009. *Guidelines for the Management of Norovirus Outbreaks in Hospitals and Elderly Care Institutions*. Wellington: Ministry of Health.

Appendix 2

Extract from the MoH Communicable Disease Control Manual 2012 - December 2017 Appendix 2: Enteric Disease⁶

Exclusion/Restriction

Cases of most enteric disease should be considered infectious and should remain off work/school until 48 hours after symptoms have ceased. Certain individuals pose a greater risk of spreading infection and additional restriction/exclusion criteria may apply. Microbiological clearance may be required for individuals infected with/exposed to certain pathogens.

The key criteria are:

- the decision to exclude any worker is based on individual risk assessment. As a general rule, any worker with symptoms of gastrointestinal infection (diarrhoea and/or vomiting) should remain off work until clinical recovery and stools have returned to normal (where the causative pathogen has not been identified). Where the pathogen has been identified, specific criteria are summarised in Table 2.4
- the overriding prerequisite for fitness to return to work is strict adherence to personal hygiene, whether symptomatic or not.

The circumstances of each case, carrier or contact should be considered and factors such as their type of employment, availability of toilet and hand washing facilities at work, school or institution and standards of personal hygiene taken into account. For example, a carrier may be relocated temporarily to a role that does not pose an infectious risk.

Pathogen specific exclusion criteria for people at increased risk of transmitting an infection to others

Pathogen specific exclusion (restricting criteria for people from work, school or an early childhood service and for subsequent clearance are summarised in Table 2.4. Additional information is also included in the table for the following groups:

1. people whose work involves preparing or serving unwrapped food to be served raw or not subject to further heating (including visitors or contractors who could potentially affect food safety)
2. staff, inpatients and residents of health care, residential care, social care or early childhood facilities whose activities increase risk of transferring infection via the faecal-oral route
3. children under the age of 5 attending early childhood services/groups
4. other adults or children at higher risk of spreading the infection due to illness or disability.

The Health (Infectious and Notifiable Diseases) Regulations 2016 do not contain any exclusionary powers or incubation periods for infectious children, or for high risk occupational groups such as people who work with children or food handlers. Instead, the medical officers of health can resort to broader powers in Part 3A of the Health Act 1956, which include directions to cases and contacts to remain at home until no longer infectious. This Manual contains the recommended exclusion periods for specific diseases (Refer: Table 2.4). There is guidance published about the 2016 regulations and Part 3A of the Health Act in www.health.govt.nz/our-work/diseases-and-conditions/notifiable-diseases/summary-infectious-disease-management-under-health-act-1956

The legislation is principles based. In this context this means that medical officer of health must weigh protection of public health (the paramount consideration) with the following principles: trying voluntary means first if likely to be effective, choosing a proportionate, and the least restrictive measure required in the circumstances, fully informing the case or contact of the steps to be taken and clinical implications, treating them with dignity and respect for their bodily integrity and taking account of their special circumstances and vulnerabilities, and applying the measures no longer than is necessary (sections 92A to 92H).

Under Part 3A a medical officer of health can direct a case or a contact to stay home (section 92I(4)(b) or 92J(4)(b)). This is when the officer believes on reasonable grounds that the case or contact poses a public health risk (as defined in the s2 Act). The direction must specify duration.

Alternatively, in the context of attendance at an educational institution, if the officer believes the infection risk is unlikely to be effectively managed by directing the case or contact, he or she can approach the head and direct them to direct the case or contact to remain at home. In serious cases, the medical officer of health can also direct the head to close the institution or part of it (s 92L).

Medical officers of health have no powers to direct closure of premises or places where people congregate, other than educational institutions. If a medical officer of health needs to manage a public health risk by excluding infectious people from certain occupations, public pools, campsites, concerts and other public environments, he or she can use directions to the individuals concerned – to stay away from a certain place, or not to associate with certain people.

The Ministry for Primary Industries has powers to close commercial food premises. In contrast, medical officer of health powers focusses on the risk the person poses.

Note that while there are provisions that apply to early childhood service workers, there are no provisions for health care workers – instead, advice should be provided to employers in terms of the Health and Safety at Work Act 2015.

Employers may decide to implement more stringent exclusion/restriction criteria in response to their own or their customers' requirements.

Appendix 3

Extract from the MoH Communicable Disease Control Manual 2012 - December 2017 Appendix 3: Patient Information¹⁰

Health education resources

Pamphlets, posters and other resources available from the Ministry of Health at www.healthed.govt.nz.

Food safety practices

The Ministry for Primary Industries

The Ministry for Primary Industries (MPI) leads New Zealand's food system, ensuring the food we produce is safe and protecting the health and wellbeing of consumers. MPI is responsible for legislation covering food for sale on the New Zealand market, primary processing of animal products and official assurances related to the export of animal and plant products and the controls surrounding registration and use of agricultural compounds and veterinary medicines. MPI is the New Zealand competent authority for imports and exports of food and food-related products.

MPI contact information: www.mpi.govt.nz/contact-us

Food safety practices in preparing and cooking a hangi: He whakatairanga i nga ahuatanga mahi mo te tunu hangi:

www.mpi.govt.nz/food-safety/community-food/marae-food-safety

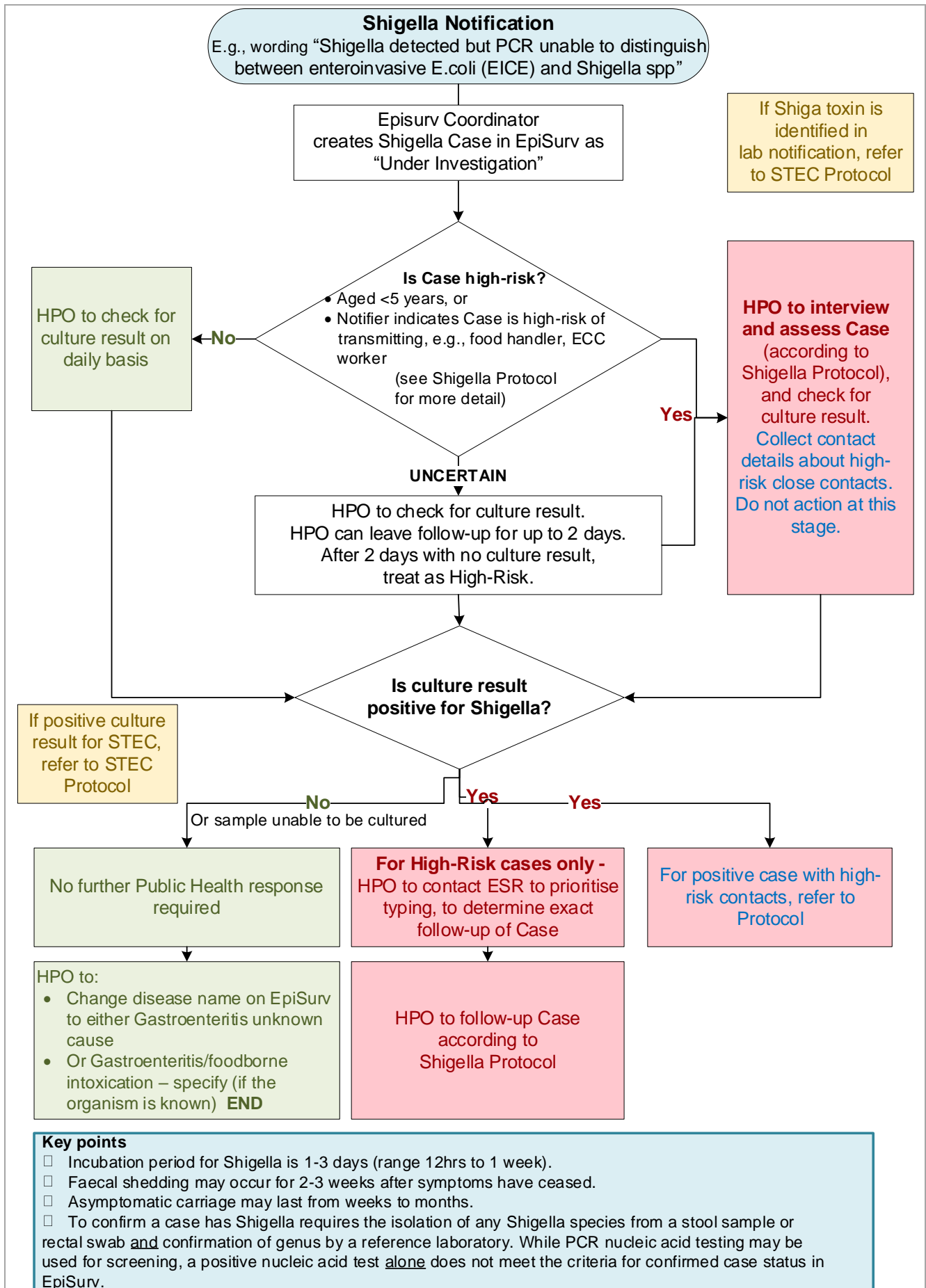
Safe food preparation – key messages

Educate the public about safe food preparation.

- Avoid working with food when you:
 - are unwell especially with a gastro infection
 - have open skin sores, boils or abscesses.
- Clean your hands thoroughly after using the toilet or changing nappies or other incontinent products for others and before and after preparing food.
- Wash raw vegetables and fruits thoroughly before juicing them or eating them fresh.
- Cook meat thoroughly before eating.
- Cook eggs and egg products properly. Avoid eating raw, incompletely cooked eggs or using dirty or cracked eggs.
- Keep hot food hot between cooking and eating it.
- Wash hands, utensils and chopping boards in hot, soapy water after handling uncooked food.
- Keep raw meat, poultry and fish separate from and below other foodstuffs so that any raw meat juice does not contaminate other foods especially ready-to-eat foods.
- Cover all stored food.
- Cover and put uneaten, cooked food in the refrigerator within 1 hour of cooking.
- Defrost food by placing it on the lower shelves of a refrigerator (if raw meat place on bottom shelf to avoid raw meat juice contaminating other foods) or use a microwave oven according to defrosting instructions. Avoid defrosting food at room temperature.
- Thoroughly reheat (until internally steaming or piping hot, at least 70°C) leftover or ready-to-eat foods before eating.
- Strictly follow use-by and best-before dates on refrigerated foods.

Find out more about how to prepare and store food safely and when you need to take extra care with some types of food at www.mpi.govt.nz/food-safety/food-safety-for-consumers.

Appendix 4: Process for following up Shigella / EICE Laboratory Notifications



Key points

- Incubation period for Shigella is 1-3 days (range 12hrs to 1 week).
- Faecal shedding may occur for 2-3 weeks after symptoms have ceased.
- Asymptomatic carriage may last from weeks to months.
- To confirm a case has Shigella requires the isolation of any Shigella species from a stool sample or rectal swab and confirmation of genus by a reference laboratory. While PCR nucleic acid testing may be used for screening, a positive nucleic acid test alone does not meet the criteria for confirmed case status in EpiSurv.

References and further information

1. NZ Communicable Diseases Control Manual 2012-December 2017 Update, Shigellosis: <https://www.health.govt.nz/system/files/documents/publications/cd-manual-shigellosis-dec17.pdf>
2. Medscape, Reference/Bacterial infections/Shigellosis <http://emedicine.medscape.com/article/182767-overview>
3. UpToDate. Shigellosis infection: clinical manifestations and diagnosis https://www.uptodate.com/contents/Shigella-infection-clinical-manifestations-and-diagnosis?source=search_result&search=shigellosis&selectedTitle=1~141
4. ESR, Notifiable Diseases In New Zealand Annual Report 2016 https://surv.esr.cri.nz/PDF_surveillance/AnnualRpt/AnnualSurv/2016/2016AnnualNDRReportFinal.pdf
5. UpToDate. Shigellosis infection: treatment and prevention in children. https://www.uptodate.com/contents/Shigella-infection-treatment-and-prevention-in-children?source=search_result&search=shigellosis%20infection%20in%20children&selectedTitle=3~141
6. MoH Communicable Disease Control Manual Appendix2: Enteric Disease. <http://www.health.govt.nz/system/files/documents/publications/cd-manual-appendix-2-dec17.pdf>
7. C&PH document, A Proposed Amendment To The C&PH Shigellosis Protocol June 2017 K:\CFS\ProtectionTeam\FinalDocs\notifiableConditions\Shigellosis\ProtocolAmendmentProposal_June_2017\Shigellosis_protocol_Proposed_amendment_Jun_2017.docx
8. Ministry of Health. 2008. Drinking-water Standards for New Zealand 2005 (Revised 2008) <http://www.health.govt.nz/publication/drinking-water-standards-new-zealand-2005-revised-2008-0>
9. MoH Communicable Disease Control Manual Appendix 1: Disinfection <http://www.health.govt.nz/system/files/documents/publications/cd-manual-appendix-1-dec17.pdf>
10. MoH Communicable Disease Control Manual Appendix 3: Patient Information <http://www.health.govt.nz/system/files/documents/publications/cd-manual-appendix-3-dec17.pdf>

Document Control

| Protocol review task | Responsibility | Date completed |
|--|----------------|----------------|
| Minor update v4: addition of flow chart and commentary to guide initial response to PCR results | PHS | V4, 11/12/2023 |
| Minor update v5: extra point added to Appendix 4. Flow chart under Key Points - <i>"If laboratory analysis does not grow shigella culture this does not necessarily mean that the person does not have shigella, only that it could not be isolated".</i> | HPO | V5, 18/01/2024 |
| Minor update v6: two additions to Appendix 4. Flow chart under Key Points - <i>Further guidance on managing high-risk contacts.</i> | HPO | V6, 8/02/2024 |