Purpose of Public Health Action

- Prompt action to prevent further cases associated with a primary source.
- Interrupt secondary transmission.

Details of case

- Notification of case via microbiology or clinician
- Establish case definition (Table 1 in supporting information).
- Obtain relevant details using current data collection form: name, address with full postcode, date of birth, contact telephone number, GP, current location of the case (home or ward in hospital), clinical condition and have specimens been collected and what type and when e.g. blood, faeces, urine samples.

Guide to Risk Assessment

If the Ref lab confirms non-VTEC E. coli, but it is causing GI disease, follow the shigella (other than sonnei) SOP.

- Household contacts who are symptomatic or in a risk group are at increased risk of spreading infection
- Note that group A includes consideration of the risks posed by 6-7 year old children (a variation to the standard definition)
- The risk of continuing exposure needs to be assessed and whether any immediate control measures need to be applied e.g. closure of premises or exclusion and screening of contacts in risk groups
- The family may need to be considered as a unit for exclusion and clearance purposes if the case and a household contact are both in risk group B

Initial Actions

- Based on the case definitions (Table 1, supporting information), ensure that the appropriate public health actions are implemented
- Obtain clinical information from GP/clinician/ward and also ascertain whereabouts of case and if they are aware of diagnosis
- Inform relevant EHO of case urgently and agree with the EHO who will complete an urgent assessment of immediate risk (within three hours of initial notification where possible). This can be carried out by obtaining information from case/family to identify if index or contacts are in risk groups, if anyone else in household is ill and if there is a history of recent travel.
- Agree with EHO who will complete the enhanced surveillance questionnaire and a timeframe for completion (ideally within 24 hours of case report).
- If it is not possible to complete within 24 hours, document the reason for this in HPZone and make every effort to complete this action as soon as possible. If the case is in hospital, may need to consider a member of the HPT visiting ward to complete questionnaire. If case is a child, obtain childcare, childminder, nursery or school details, including contact name and telephone number

Timings of exclusions, clearance and screening samples should be considered carefully if the case and a household contact are both in risk group B, or if a case/contact are aged 6-7 years.

If case/contact are aged 6-7 years (risk group A), follow screening and exclusion strategy below and inform family at the start of the strategy to be followed:

- Undertake clearance screening during initial two week period.
- If child hasn’t cleared during this period, further strategy to be based on a risk assessment of whether they are able to observe good personal hygiene and on the supervision available from teachers/carers.
• If this is in place, then child can return to school before negative results but sampling should continue to ensure clearance
• If this is not in place, then clearance is needed before the child can return.

Providing advice to cases and contacts
• Advise case and contacts to seek medical attention if they develop symptoms or their current illness worsens
• Ensure exclusion advice is given to all symptomatic cases and contacts. Some cases or contacts may require formal exclusion by the LA.
• Ensure cases and contacts in risk groups (regardless of symptoms) understand the requirements for returning to work/child care/school
• Ensure verbal advice on preventing transmission is provided to the family on the day of notification and this is recorded in HPZone. This should be followed up with written information either by post or email.
• Ensure pregnant contacts are aware of nature of symptoms and that they seek medical attention if they become unwell.

Further considerations – assessing source and risk of continuing exposure
• CCDC to review information in completed questionnaire ASAP to check for risk factors e.g. farm contact or common factors with other cases and consider if further action is indicated
• Further exploratory questions may need to be asked if no obvious source can be identified.
• If exposures have occurred anywhere within the Anglia area in 2 weeks before onset inform the relevant EHD immediately
• Work with EHD to ascertain source of infection and identify and agree control measures.
• If exposures have occurred outside of Anglia HPT area in 2 weeks before onset inform the relevant HPT immediately
• Check for link to other cases on the Anglia database
• Consider an IMT meeting with local authority if linked cases identified.
• For linked cases associated with farm premises, nurseries or schools please refer to The VTEC operational manual

Communications
• Provide information and advice to GP of case about any clinical assessments and/or screening for case and/or contacts. VTEC information sheet for GPs is available for cases not being managed in hospital
• Inform the local microbiology department if any faecal samples are required to be tested for either diagnosis or screening. Ask the laboratory to ensure any positive isolates are sent to Colindale for phage typing.
• Fax copy of questionnaire to relevant EHD if HPT have completed this with case
• Fax copy of completed enhanced surveillance questionnaire to PHE Colindale (safe haven fax 0208 327 7112) within 24 hours of case being reported. If this is not possible the reason for this should be documented in HPZone and every effort made to complete this action as soon as possible.
• If case is of a sensitive nature e.g. death or if more than one linked case then inform regional comms team
• Inform local DPH if more than one linked case
• Involve HSE and/or Defra where appropriate
• Consider alerting GPs in local area if appropriate

Records
• Record as a case on HPZone
• Ensure all details of contexts are added to HPZone such as open farms, school, nursery
• Any contacts who turn out to be positive should also be recorded as cases
• Ensure any electronic and/or paper records comply with NSC records management protocol

Follow up
• Follow up case and contacts according to the VTEC operational manual.
• For cases and/or contacts in risk groups a named clinician should be identified as case manager to ensure continuity and consistency of follow up

HPZone can be found at https://hpzone.org.uk
Mode of transmission
1. Contact with infected animals, their faeces or environment
2. Ingestion of contaminated food or water. Reservoir is the gastrointestinal tract of cattle, goats and other domesticated animals
3. Person to person spread (faecal-oral) can occur by direct contact (or via fomites), particularly in households, nurseries and infant schools.
4. Environmental exposure.

Incubation period
Usually 3-4 days, but up to 14 days have been reported

Infectious Period
As long as the organism is being excreted which is variable but usually longest in small children (can be several weeks)

The following groups are considered to pose an increased risk of spreading gastrointestinal infection

Group A: Any person of doubtful personal hygiene or with unsatisfactory toilet, hand-washing or hand drying facilities at home, work or school. Particular consideration should be given as to whether individual infant-school-aged children (aged 6 or 7 years) are able to satisfactorily observe good personal hygiene. Health protection personnel (LA and HPT) should agree locally on how to make this assessment in engagement with parents or teachers/carers.

Group B: All children aged 5 years old or under, including those who attend school, pre-school, nursery or other similar child care or minding groups.

Group C: People whose work involves preparing or serving unwrapped food to be served raw or not subjected to further heating.

Group D: Clinical, social care or nursery staff who work with young children, the elderly, or any other particularly vulnerable persons, and whose activities increase the risk of transferring infection via the faecal-oral route. Such activities include helping with feeding, or handling objects that could be transferred to the mouth.

A contact is any person who is believed to have had significant risk of direct or indirect exposure to the excreta of an infectious person.

Examples of people who may be considered contacts are given below:

- A person living in the same household as the index case or regularly sharing food or toilet facilities with the index case during the infectious period, e.g extended family members who frequently visit the household and childminders and their families.
- A person who has regularly eaten food prepared by the index case during the infectious period, or who ate food prepared by the index case on a single occasion during the infectious period if there is concern about the hygiene practices of the index case or if the index case had diarrhoea at the time of food preparation.
- Any person who has been involved in nappy changing or assistance with toileting of the index case during the infectious period, if the index case is a child in nappies or requiring assistance with toileting.
<table>
<thead>
<tr>
<th>Clinical features</th>
<th>Epidemiological link to CONFIRMED VTEC case or source</th>
<th>Laboratory findings (see Sections 4.3 and 4.4 of the VTEC Support Document)</th>
<th>Action required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Acute non-bloody diarrhoea</td>
<td>Present</td>
<td>Awaiting lab testing</td>
<td></td>
</tr>
</tbody>
</table>
| Acute non-bloody diarrhoea | Absent                             | Local lab testing incomplete. Isolate has the following characteristics:  
- POSITIVE typical colony morphology on appropriate selective medium  
- POSITIVE O157 (by slide agglutination OR latex kit)  
- AWAITING biochemical identification of *E. coli* |                |
| Probable          |                                                   |                                                                                |                |
| Acute bloody diarrhoea | Present or absent                   | Local lab testing incomplete. Isolate has the following characteristics:  
- POSITIVE typical colony morphology on appropriate selective medium  
- POSITIVE O157 (by slide agglutination OR latex kit)  
- AWAITING biochemical identification of *E. coli* | Initiate or complete confirmatory testing |
| Symptomatic or asymptomatic | Present or absent                   | Local lab isolate identified as “presumptive (locally confirmed) *E. coli* O157”  
- POSITIVE typical colony morphology on appropriate selective medium  
- POSITIVE O157 (by slide agglutination OR latex kit)  
- POSITIVE biochemical identification of *E. coli* |                |
| HUS without known alternative aetiology | Present or absent                   | Awaiting lab testing                                                        |                |
| Confirmed         |                                                   |                                                                                |                |
| Symptomatic or asymptomatic | Present or absent                   | Reference lab (Laboratory of Gastrointestinal Pathogens, Cfl. Colindale), confirmed isolate  
- POSITIVE confirmation of *E. coli*  
- POSITIVE O157 or other O-serogroup  
- POSITIVE genes for Vero cytotoxin | Initiate or continue public health action |
| HUS               | Present or absent                       | Reference lab (Laboratory of Gastrointestinal Pathogens, Cfl. Colindale)  
POSITIVE serological evidence of infection with *E. coli* O157 or other VTEC (presence of antibodies to O-antigen) |                |

*NB: For Ref lab confirmed category, the criteria are confirmation of *E.coli* AND positive O157 or other serogroup AND positive genes for vero cytotoxin*
<table>
<thead>
<tr>
<th>Designation</th>
<th>Epidemiology</th>
<th>Illness</th>
<th>Incubation</th>
<th>Sources</th>
<th>Main ‘O’ Serogroups</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterohaemorrhagic</td>
<td>- Most cases sporadic.</td>
<td>- Bloody or non-bloody diarrhoea, haemorrhagic colitis, haemolytic</td>
<td>6 hrs – 10 days</td>
<td>Animal reservoir. Contaminated food/water, direct contact with animals, secondary spread.</td>
<td>26, 128, 139, 111, 113, 121, 145, 157</td>
</tr>
<tr>
<td>(EHEC)</td>
<td>- Outbreaks may affect communities e.g. nurseries, schools, restaurants,</td>
<td>uraemic syndrome (HUS), thrombocytopenic purpura.</td>
<td>(2 – 4 days most</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>nursing homes, hospitals, open farms, campsites, swimming pools.</td>
<td></td>
<td>common)</td>
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</tr>
<tr>
<td>Enteropathogenic (EPEC)</td>
<td>- Sporadic cases &amp; outbreaks in children, usually &lt; 2yrs, especially in</td>
<td>- Watery diarrhoea, abdominal pain, nausea, vomiting &amp; fever.</td>
<td>2 – 73 hrs</td>
<td>Faeco-oral</td>
<td>18, 25, 26, 44, 55, 86, 111, 114, 119, 125, 126, 127, 128ab, 142, 158, 608</td>
</tr>
<tr>
<td></td>
<td>developing countries.</td>
<td>- Fatigue, myalgia or headache may occur.</td>
<td>(median: 8 – 18 hrs)</td>
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<td></td>
<td>- Outbreaks reported in schools, neonatal units, food premises, hotels.</td>
<td>- Duration 6 hrs to 4 days (diarrhoea may be prolonged).</td>
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<tr>
<td>Enteroxigenic (ETEC)</td>
<td>- Major cause of traveller’s diarrhoea.</td>
<td>- Watery diarrhoea &amp; abdominal pain.</td>
<td>1 – 166 hrs</td>
<td>Food &amp; water contaminated by humans. Nosocomial outbreaks reported</td>
<td>6, 8, 11, 15, 20, 25, 27, 63, 78, 80, 85, 114, 115, 128ac, 148, 149, 153, 159, 167, 173</td>
</tr>
<tr>
<td></td>
<td>- Dehydrating diarrhoea in children in developing countries.</td>
<td>- Headache, fatigue, nausea, anorexia, vomiting or fever may occur.</td>
<td>(median: 10-50 hrs)</td>
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<tr>
<td></td>
<td>- Outbreaks assoc. with restaurants.</td>
<td>- Duration: 6 days</td>
<td></td>
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<tr>
<td>Enteroinvasive (EIEC)</td>
<td>- Occasional cause of traveller’s diarrhoea or outbreaks in developed</td>
<td>- Watery diarrhoea, often with blood &amp; mucus, abdominal pain, fever.</td>
<td>1 – 156 hrs</td>
<td>Contaminated food. Probable human reservoir</td>
<td>28ac, 29, 52,</td>
</tr>
<tr>
<td></td>
<td>countries.</td>
<td>- Duration: up to 2 weeks</td>
<td>(mean: 35 hrs)</td>
<td></td>
<td>112ac, 115, 124,</td>
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<td></td>
<td>136, 143, 144, 145, 147, 152, 159, 164, 167</td>
</tr>
<tr>
<td>Enteroaggregative</td>
<td>- Common in developing countries &amp; a risk for travellers. Children more</td>
<td>- Diarrhoea, usually watery, prolonged.</td>
<td>8 – 18 hrs (possibly</td>
<td>Contaminated food &amp; possibly water.</td>
<td>3, 15, 19, 44, 62, 73, 77, 86, 98, 111, 113, 127, 134</td>
</tr>
<tr>
<td>(EAggEC)</td>
<td>commonly affected.</td>
<td>- May be blood or mucus, abdominal pain, low grade fever, nausea or</td>
<td>longer)</td>
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<tr>
<td></td>
<td></td>
<td>vomiting.</td>
<td></td>
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<td></td>
<td></td>
<td>- Often chronic in children or AIDS.</td>
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</tbody>
</table>

1 Sources: Communicable Disease Control & Health Protection Handbook (Hawker et al), Principles and Practice of Infectious Diseases (Mandell et al)
2 Also known as verocytotoxict E. coli (VTEC) and Shiga toxin producing E. coli (SHEC)