Final Report

Enhancing surveillance of potentially foodborne enteric diseases in New Zealand

Trialling new methods for surveillance and investigation of potentially foodborne enteric diseases

1 July 2007 – 30 June 2008

NZ Food Safety Authority Contract (FDI/232/2005)

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Glossary

CMP	Campylobacteriosis in the Manawatu project
Common enteric diseases	Salmonellosis, Yersiniosis, Cryptosporidiosis, Giardia Campylobacteriosis
CRF	EpiSurv Case Report Form
EARS	ESR's Early Aberration Reporting System
ECC	Early Childcare Centre
EHO	Environmental Health Officers
EpiSurv	New Zealand's Notifiable Disease Database
ESR	Institute of Environmental Science and Research Limited
FBI	Foodborne Illness
MCPHS	MidCentral Public Health Service
NZFSA	New Zealand Food Safety Authority
Other Enterics	Salmonellosis, Yersiniosis, Cryptosporidiosis, Giardiasis
PHS	Public Health Services
TLA	Territorial Local Authority
TO	Technical Officer

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Executive Summary

The enhanced notified enteric disease surveillance trial began on 1 July 2007 and ran until 30 June 2008. The overall aim of the trial was to establish a demonstration site Public Health Service (PHS), to measure quality, timeliness and completeness of data collected and submitted to Institute of Environmental Science and Research Limited (ESR), via the national disease database (EpiSurv) for notified cases of enteric diseases.

The trial initiatives were to:

- Trial a short pre-screen mail questionnaire, with reply paid envelope, to all notified cases of Salmonellosis, Yersiniosis, Giardiasis and Cryptosporidiosis (other enterics) in the Manawatu, Horowhenua and Tararua regions. Complete EpiSurv case report fields using information supplied in the returned questionnaires and compare data return rate, timeliness, and completeness with the telephone interview group.

- Use telephone interview techniques to improve the contact rate, timeliness and completeness of data gathered from all notified cases of Campylobacteriosis in the Manawatu, Horowhenua and Tararua regions. The target set for the project was to achieve a 95% contact rate, with 90% full completion of all EpiSurv data fields.

- Monitor the ESR Early Aberration Reporting System (EARS) flags for increased levels of disease against the historical disease rates, as a tool to identify potential outbreaks in the region

Prior to the start of the study MidCentral Public Health Services (MCPHS), between 1 July 2004 to 30 June 2005[1], made contact with around 58% of all notified cases of Campylobacter and 77% of all other notified enteric disease cases.

The trial results were:

- **All other enteric disease notifications via postal questionnaire:** 53% of all cases contacted via mail questionnaire responded within 2 to 63 days (6 day median) with 81 – 100% completion of EpiSurv case report data fields.

- **Campylobacteriosis notifications via telephone interviews:** 97% of all notified Campylobacteriosis cases were contacted in 0 to 20 days (3 day median) with 96 – 100% completion of EpiSurv case report data fields.

- **No outbreaks were identified by monitoring the EARS system, which had not already been identified by PHS staff.** However, EARS has become an important tool in the MCPHS for comparing local rates of disease with bordering PHS and provides a good quick reference tool for media enquires. In addition, the graphs produced in EARS have been well utilised as visual aids for training and seminars presented during the trial period.

[1] Historical analysis for the 2005 to 2006 period was not comparable as MCPHS had enhanced it's data collection methods for Campylobacteriosis in June 2006 to support the *campylobacter* in the Manawatu project

The results of our surveillance trial initiatives are compared to the rest of NZ over the same time frame and with a comparable PHS. While the contact and completion results from the MCPHS telephone interviews trial were similar to the comparable PHS results, the MCPHS results were significantly higher than for the rest of NZ (Refer Table 10). The postal questionnaires achieved a lower contact rate than the comparable PHS but similar to the rest of NZ. However, the quality of data gathered in the MCPHS postal questionnaire was significantly higher in most fields. (Refer Table 5). Additional analysis was undertaken which indicated those cases living in higher deprivation areas were less likely to respond to a postal questionnaire, as were people from rural areas. An overrepresentation of common enteric disease notifications cases from rural areas in the MCPHS, was also highlighted by our research.

This trial has shown the effectiveness of utilising telephone interviews and telemarketing techniques for gathering timely and complete data within the Public Health Service. It has also demonstrated that a short 2 page pre-screen questionnaire can be effective in collecting quality data needed to complete the EpiSurv case report form.

1. Introduction

1.1Background

NZFSA has an aim to reduce food-related risks to human health. As part of the Science Strategy, human health surveillance has been identified as an essential element of the monitoring and review component of the risk management framework. Evidence from outbreak investigations and epidemiological studies of human enteric diseases are being used increasingly as sources of data for risk assessments.

The application of this data is often restricted by the strength of the evidence presented and its interpretation. A further limitation is that most investigations/studies are performed, analysed and interpreted in the context of urgent disease control needs rather than planned aetiological studies.

A range of reports has described deficiencies in the present Public Health Investigation and Management of identified cases of human enteric diseases, including differing practices among PHS. Additional training for Health Protection Officers and Medical Officers of Health is proposed.

Recently a multi-agency Human Enteric Disease Surveillance Steering Committee has been established. The Steering Committee is to provide a strategic direction for human enteric disease surveillance to ensure there is a co-ordinated system in New Zealand which assists in the reduction of the disease burden of human enteric disease. A paper, *Enhanced Sentinel Surveillance for Enteric Disease in New Zealand: the advantages, disadvantages and feasible options,* was circulated for comment.

Based on the comments received two of the identified priorities were: “establishing a demonstration site for trialling initiatives to modify current public health investigation practices for cases of human enteric disease” and “developing a prototype sentinel surveillance site”.

Sentinel surveillance systems involve selecting reporting sites or regions where a number of key components of a surveillance system are enhanced with an aim to produce enriched surveillance data and more accurate outcomes. One of the most crucial roles in any sentinel surveillance site is timely and effective reporting of data from cases of the diseases of interest to support additional microbiological or epidemiological analysis that may follow (2, 12). A PHS with consistent high quality data could ultimately support the development of a prototype sentinel surveillance site.

Software enhancements to support improved data collection have recently occurred to the EpiSurv programme – the national data base for communicable diseases - run by the Institute of Environmental Science and Research Ltd (ESR). However this has left present processes within the Public Health Services (PHS) essentially unchanged.

1.2 The Project

In June 2006 MidCentral Public Health Services (MCPHS) was contracted by NZFSA to undertake a project aimed at establishing MidCentral Public Health Services as a demonstration enteric disease surveillance site. This would be achieved via a trial aimed at improving quality, timeliness and completeness of data recorded on the EpiSurv national disease surveillance database.

The Manawatu was selected for this project for a number of reasons including:

- Population size
- Urban rural mix
- PHS with enhanced monitoring already in place
- Laboratory confirmation of isolates sent directly to MCPHS from the sole regional laboratory prior to legislation being introduced in December 2007 mandating this practice.

The aims of the enhanced surveillance project were to:

- Establish a demonstration Public Health Unit in which new methods and processes for surveillance and investigation of potentially foodborne human enteric diseases can be trialled and evaluated
- Gather information in ways which give added value, (namely potential risk factors or exposures), to results obtained through further laboratory investigation(2) i.e. molecular typing [2]
- Develop consistency in the data collection and management of notified foodborne disease locally and provide recommendations for this to occur nationally
- To demonstrate the value of upskilling the Health Protection workforce through a Health Protection Officer participating in the Masters in Veterinary Public Health study programme

A steering group for the project was established including representatives from: NZFSA, Ministry of Health, ESR, MCPHS, Community and Public Health Christchurch, Auckland Regional Public Health, and Medical Officers of Health.

The first meeting was convened on the 13 of October 2006 and during this meeting three initiatives were proposed:

1. **Trialling a Postal Questionnaire to all Notified "other Enteric" Disease Cases (defined as Salmonellosis, Cryptosporidiosis, Giardiasis, Yersiniosis)**

2. **Intensively investigating Campylobacteriosis cases using telephone marketing techniques as a comparative method of data collection**

3. **Assessing the use of the ESR Early Aberration Reporting System (EARS) as an Outbreak Alert Tool at PHU level**

[2] This aspect of the contract is not covered in this report but is reported in **French, N.** 2008. Enhancing Surveillance of Potentially Foodborne Enteric Diseases in New Zealand: Human Campylobacteriosis in the Manawatu. Massey University. The surveillance data collected as part of the campylobacteriosis telephone trial was utilised as part of this molecular typing project.

A project plan for the proposed trial initiatives was completed incorporating a SWOT analysis (9).

This report outlines the methods used and outcomes for the 1 year trial, run between 1 July 2007 and 30 June 2008, at the MCPHS. The trial involved a modification of reporting/monitoring systems for notified enteric diseases and ultimately significantly improved the completeness, timeliness, and quality of the surveillance reporting submitted to EpiSurv by MCPHS.

2. Preparation for Trial Initiatives

This section outlines the preparation of the MCPHS to become a trial site and considers systems in use by other PHSs to undertake common enteric disease surveillance and food borne illness investigation. Regular teleconferences were held with the Steering Group to provide guidance on the trial programme plan.

Two reviews were undertaken prior to the start of the trial: an internal review within MCPHS to prepare staff and gather resources required for the trial; and a review to gather as much information as possible about surveillance methods within other PHSs.

2.1 Internal preparation

2.1.1 Methods

Within the MCPHS, the systems used for reporting of notified enteric diseases to ESR were reviewed. Access and training in the use of EpiSurv was given to HPOs undertaking work for the project.

Additional training in designing custom reports within the EpiSurv database was completed.

Protocols around logging and interpreting the data gathered were established for those undertaking the interviews and reviewing returned questionnaires. (Refer Section 10.2 Protocols for Entering Data and the Trigger Tree).

HPOs were trained in: interviewing cases and qualifying their answers; and the use of telephone headsets and real time data entry (i.e. direct entry into EpiSurv website from phone interview) using the ESR Case Report Form (CRF).

2.1.2 Results

Training, protocols and resourcing to begin the trial were put in place and a progress report for NZFSA was completed in June 2007. (8). Templates for quarterly reports were designed as a means for providing progress reports during the trial to the steering group (10).

Additional resources required for the HPOs participating in the data collection included:

- Telephone headsets
- Telephones compatible with headsets
- Staff prepared to work evening shifts
- Quiet space to make phone calls

2.1.3 Discussion

A review of internal systems was undertaken within the MCPHS. This allowed us to have a clear understanding of:

- Protocols we would need to create
- Identifying training requirements for those involved
- Procuring new resources

Overall this exercise was about identifying the level of change required within the MCPHS to meet the aims of the project. The key change was devolving the follow up of notified common enteric diseases from 4 regional HPOs to a single HPO with responsibility for follow up regardless of which MidCentral regional area the case was notified from.

2.2 Review of PHS Systems for Common Enteric Disease Surveillance

2.2.1 Methods

A telephone survey of Public Health Services was undertaken in March 2007 to assess current methods for gathering enteric disease notification surveillance data. The core questions asked were:

- What system do you use to follow up notified cases of Campylobacteriosis?
- What system do you use to follow up other enteric diseases?
- If you use a postal questionnaire what is your return rate? (If it was not measured they were asked to estimate the response rate)
- Can you send a copy of your questionnaire?

2.2.2 Results

The telephone survey undertaken in March 2007 of PHS highlighted the differing approaches taken for the gathering of enteric disease surveillance data entered into EpiSurv (refer Table 1). The data collection methods used included the following: educational advice only by post; postal questionnaire including educational advice; telephone interview; or a face to face interview with the case. For the risk factor section of EpiSurv there was also variation in how it was completed with some PHSs asking about all the risk factor fields and others just completing the section identified by the case as the likely source. The differences highlighted in Table 1 between and within the PHSs affect the quality of the data and could bias conclusions formed by any research using the data at a local, national or international level.

PHSs identified as using postal questionnaires were asked if they knew what the return rate for their postal questionnaires was. No analysis was identified that indicated this response rate had been measured in any formal way. Six of the PHSs interviewed estimated the percentage they thought were returned. Three estimated the return rate for their region was between 60 to 70% and three estimated between 50 to 60%.

Table 1: Survey of NZ Public Health Units data collection methods for notified cases of common enteric disease

PHS	TLA Follow up	Notified Campy	Trigger point	Action	Notified Giardia	Notified Crypto	Notified Salmonella	Notified Yersinia	Comment
PHS Northland		TI			TI	TI	TI	TI	NA
Auckland RPHS		AP	FC, IN	PQ	AP	AP	AP	AP	Questionnaire 7 pages
PHS Waikato *		AP			TI, VI	TI, VI	TI, VI	TI, VI	Request campy cases ring PHU
PHS Toi Te Ora		AP	HRG	TI	TI	TI	TI	TI	
PHS Tairawhiti		PQ	HRG, IN, FC		PQ	VI	VI	VI	
PHS Taranaki		PQ	HRG		TI then PQ	TI then PQ	TI then PQ	TI then PQ	
PHS Hawkes Bay		PQ	HRG		PQ	PQ	PQ	PQ	
MidCentral PHS Palm Nth		PQ	IN,HRG,FC		TI	TI	TI	TI	Questionnaire 4 pages
MidCentral PHS Wanganui		PQ	HRG		TI then PQ	TI then PQ	TI then PQ	TI then PQ	Questionnaire 5 pages
RPH Lower Hutt	Yes (priority1)	AP	>50	PQ	AP	AP	AP	AP	Prioritise 1 or 2, Pre-screen 1 +
RPH Wairarapa		AP	HRG		AP	AP	AP	AP	
PHS NelsonMalborough		AP			TI	TI	TI	TI	Request campy cases ring PHU
CPH Christchurch		PQ	HRG, IN, FC		PQ	PQ	PQ	PQ	Questionnaire 2 pages
CPH Greymouth*		PQ	IN	TI	PQ, VI, TI	PQ, VI, TI	PQ, VI, TI	PQ, VI, TI	Questionnaire 4 pages
CPH Timaru		TI, PQ			TI	TI	TI	TI	Questionnaire 4 pages
Public Health South Dunedin	Yes	TI, PQ			TI, PQ	TI, PQ	TI, PQ	TI, PQ	
Public Health South Invercargill		TI, VI			TI, VI	TI, VI	TI, VI	TI, VI	

* Different systems within the PHS managed by the HPO responsible for the geographical area the case is notified

Key	Advice by Post	**AP**	Telephone interview	**TI**
	High Risk Group	**HRG**		
	Increase in notifications	**IN**	Food Complaint	**FC**
	Visit	**VI**	Postal Questionnaire	**PQ**

3. Postal Questionnaire Trial for Other Enterics

3.1 Methods

3.1.1 Developing a Postal Questionnaire

Copies of all the questionnaires in use throughout the NZ PHSs and additional food and water borne disease questionnaires were gathered via NZFSA, the internet, and from ESR. These questionnaires were reviewed and unique or different approaches identified. A copy of the review and the collected questionnaires were circulated to the steering group (refer Table 3).

A qualitative review of 27 questionnaires used for collecting notified or self reported enteric disease surveillance data was conducted. While the questionnaires were designed for surveillance of enteric disease at the case/public health interface, the purpose of the questionnaires varied. Some were for sporadic cases and others for outbreak investigation. The questionnaires reviewed were all designed for different modes of delivery including: postal, telephone interview, online, face to face interview.

Table 2: Qualitative analysis of 27 enteric disease surveillance questionnaires including local and international questionnaires for use either by phone, in person or via a postal service

Information requested by questionnaires	Number	Comment
Demographic* i.e. name, age/DOB, sex, address	27	
Occupation and place of Work*	27	
Early Child Care Centre/School*	27	
Ethnicity*	15	Notably none of the questionnaires reviewed from outside NZ included an ethnicity question nor was it included in a number of the NZ postal questionnaires
Onset of Illness*	27	
Food Premises	25	A NZ campylobacter questionnaire and a UK FBI questionnaire
Foods Eaten	26	Mainly associated, with a food premise. Some included space for info on foods eaten at home and optional diary's for the 3 -7 days prior to onset of illness
Drinking water sources* (water supply code** a core EpiSurv field)	25	One included water under the food section and a UK FBI questionnaire excluded the question
Animal contact**	21	12 of the 17 PHU questionnaires requested further info regarding domestic pets and one included a section on wild animals
Contact with Sick Animals**	21	Some specifically about animals with diarrhoea 2 requested any diagnosis of animals illness
Hospitalisation*	19	Some differentiated between A&E and admission to a ward. This information is also gathered by NZ Health Information Service and may not need to be included in a postal questionnaire
Contact with a person with similar symptoms*	14	Request for further information such as names and relationships. One questionnaire requested names and details of everybody who had stayed in the case's home for the 10 days prior to onset of the case's illness

Types of Symptoms** (needed to establish case meets clinical criteria section* EpiSurv)	14	This information was less likely to be asked for in a mail questionnaire for a notified case and more likely for gastroenteritis or forms for self reported cases. The question is quite important in establishing the case meets the clinical criteria to be a case in EpiSurv.
Contact with a person: same illness** (based on a clinical diagnosis)	13	Requested further information relating to names and relationships
International Travel**	13	Including countries visited and dates of departure and arrivals
Recreational; water contact *	13	Type of contact
Events/ Gatherings	13	Had the case attended any? Some included prompts i.e. wedding, festivals, pot luck dinner
Activities	10	Some specifically asked about camps/outdoor recreation
Listing High Risk Foods	9	Included lists of high risk foods to prompt cases
Contact Sewage Faecal matter*	9	
Type of household sewerage system	2	
Food shops used	9	To purchase food for home consumption
Brand name	5	Brand name of consumed products
Duration of Illness	8	One included a calculation to work this out
Home food preparation	8	In the context of "failures" others included a check list audit of kitchen procedures
Specific Meats	6	Some included tick boxes and prompts
Undercooked Chicken	4	Consumption of undercooked chicken
Handling raw meat or poultry	4	
Fresh or frozen poultry	2	Question related to exposure to fresh or frozen poultry during the incubation period
Domestic Travel	6	Within the country of the questionnaires origin
Household contacts	5	The number of others living in the house with the case
Holiday or work	1	Was the case on holiday or at work during incubation
Medications	3	Questions on treatment by GP and type of medications received
Privacy	5	One relating to the use of the cases name during an investigation and one relating to the information gathered relating to others with similar symptoms. I.e. "Ask this person before you include their name"
What did the case think	9	What they thought might have caused their illness either with a direct question or by asking for comments

* Category three EpiSurv fields - optional data collected for further investigations of cases/outbreaks
** Category one or core EpiSurv fields

There were a number of issues noted and discussed by the steering group.

- Gathering of additional extraneous information identified in some of the current NZ questionnaires is possibly unnecessary and unlikely to be used in surveillance of sporadic cases of an enteric disease. This could be considered a breach of the Health Information Privacy Code 1994 (7)
- Whether the more in-depth questionnaires were appropriate for a first contact (screen) with a probable sporadic case, when a trigger or commonality with other cases had not yet been identified
- There were no additional fields within EpiSurv to gather/store risk factor information which may be of concern or topical to a PHS on a local level e.g. unpasteurised milk consumption in rural areas

Only one questionnaire (designed by Wellington Regional Public Health) had a "pre-screen" front page which included a number of "Yes"/"No" questions. These pre-screen questions gathered most of the data required to complete a case report form in EpiSurv, and thereby precluded people with no clear source or risk factor from having to complete a whole five page questionnaire. This pre-screen questionnaire was selected and adapted by the steering group for use as a two page postal questionnaire (Refer Section 10.1 Cover Letter and Questionnaires Used During the Trial).

3.1.2 Administration of Postal Questionnaire

The majority of other common enteric disease notifications (includes all notifications of Cryptosporidiosis, Giardiasis, Salmonellosis, and Yersiniosis) received by MCPHS are directly from the local Medlab Central laboratory. These notifications are received by administration staff, who search hospital databases for patient details i.e. NHI number, current address and phone numbers. If staff are unable to find these details they contact the relevant General Practice. Demographic information gathered is then entered electronically onto an EpiSurv CRF a hard copy is printed and referred to during the follow up process.

The time target was to enter all notified cases onto EpiSurv within 24 hours and to send the mail packs to the cases on the same day notifications were received by the PHS. No further attempt to contact notified cases was made after sending the questionnaire.

All notified cases of other enterics arising from the MCPHS region between 1 July 2007 and the 30 June 2008 were sent a mail out pack including the pre-screen questionnaire.

The mail pack included:

- Covering letter: including information on exclusion from work (those in high risk occupations), school or childcare
- Short screening questionnaire
- Reply Paid envelope
- Information pamphlet
- Food safe pamphlet
- Fridge Magnet

It had been identified in the project plan, (based on past notifications), that there was likely to be between 118 to 129 cases of other enterics notified in the MCPHS region over the year of the trial.

3.1.3 Data Analysis Methods

A custom EpiSurv report was designed to extract the data for analysis, incorporating the required fields for measuring: return rate, timeliness, and completeness of the returned postal questionnaires.

Reports of these outcomes were run quarterly and at the conclusion of the trial. All reports were transferred into Microsoft Excel for analysis. All calculations were done using Excel functions and in particular the use of pivot tables.

Table 3: Fields selected to run custom quarterly reports and used for final analysis of data gathered during the trial

Field	*Reason to include*
EpiSurv No	Used as unique identifier to identify hard copy of case if data error entry noticed
Report date*	Hard copies filed under month reported
Status*	Indicates a confirmed case. Probable cases were excluded for analysis
Sex*	Analysis for quality of data gathered
Age*	Analysis for quality of data gathered
Ethnicity*	Analysis for quality of data gathered
Meshblock	For spatial analysis of interviews and postal questionnaire spread with in the region
NZ Deprivation Index	For analysis of relationship between deprivation level and response
Occupation*	Analysis for quality of data gathered
Onset of illness*	Analysis for quality of data gathered
Fits Clinical description	Identifies if the case is deemed a case in EpiSurv
Method of investigation	Analysis for method used
Investigation sent date	Calculate time to contact or return questionnaire
Investigation received date	Calculate time to contact or return questionnaire
Risk Factors**	Indicates the case has been contacted and the spread and completeness of Information gathered
Comments section	Validates information included in the CRF, Lab numbers from Medlab were also logged into this section as unique identifiers for specimens being transferred to Hopkirk research labs for Multilocus typing for the CMP Relevant for extra information and sorting data

*** core fields in EpiSurv which are measured annually by the ESR Quality Report**
****contact with: farm animals, sick animals, other sick people, recreational water and/ or Consumed: untreated water, food at a food premise or been overseas**

It was intended to compare trial results with pre-trial surveillance data results within MCPHS. Prior to the beginning of the trial there was a significant change to EpiSurv with the launch of SURVINZ EpiSurv V 7.2.1 on 3 April 2007. This resulted in a changed format for the collected surveillance data and the beginning of recording investigation method. Prior to the implementation of EpiSurv 7.2.1 the method of follow up used for notified cases was not recorded in the EpiSurv system. In addition, there was no provision in the previous EpiSurv format for recording questionnaire return/contact dates for notified cases. Unfortunately for pre-trial surveillance data the method of contact varied and was not recorded, so it is not possible to directly compare the historical method of contact with the trial data.

The trial data was compared to surveillance data provided by ESR from a comparable PHU (region, size and predominant industry) and from all PHSs (excluding MCPHS). ESR supplied data sets for all cases of Campylobacteriosis, Salmonellosis, Giardiasis, Cryptosporidiosis, and Yersiniosis, to look at contact rate and completeness (see Table 5). Return rate from the postal questionnaire trial was compared with contact rate from the ESR data, as it was not possible to determine the method of data collection for the other PHSs surveillance data. Missing field data were reviewed and assigned as "unknown" (the majority) or "no". Contact rates and completeness were calculated using the Excel "Count if", % and pivot table functions.

Return Rate

Return rate was calculated by using the denominator of all postal questionnaires sent out. If a case needed additional contact other than by postal questionnaire (e.g. required contact by phone or interview due to a trigger for public health action) this was identified in the return rate calculation i.e. if additional contact was initiated prior to a response to the postal questionnaire the case was excluded from the trial if additional contact was initiated after a completed questionnaire had been received by the PHU they were included in the trial.

Further analysis for the Manawatu data was undertaken using the NZDep2006 Index (as determined by meshblock) to examine the deprivation level assigned to where a case lived, and any association with the response rate in the postal trial. Cases were divided into NZDep 2006 indices 1-5 or 6-10. Expected response rates were calculated by multiplying the number of questionnaires sent to the addresses within the category of NZDep 2006 index with the response rate of the questionnaire trial. This expected response rate was compared with the observed response rate in these 2 categories, and the differences assessed using the Chi-Squared test.

Likewise, analysis using meshblocks and ArcGIS 9 to map the spatial location of notifications received during the trial, was used to determine the rural versus urban locality of notified cases, and the association with response rates in the postal trial. The Chi-Squared Test and p values were calculated to see if response rates differed significantly by these parameters from the expected response rate (calculation based on overall postal trial response rate).

Return Rate was also compared with other PHSs Contact Rate. The "investigation method field" was explored as a way to sort the data into the system of data collection used for investigation of the notification. However, a review of this field versus information contained in the "comments" field showed inconsistent results between the system selected in the method field and the system identified as used in the comments section. Therefore, it was not possible to compare the same method of data collection with other PHSs.

To determine, in data supplied for the rest of NZ and the comparable PHS, whether a notification was contacted or not, cases were categorised into 2 groups: "Contacted" and "Not Contacted". Cases were deemed contacted if they had an "onset date" recorded and two or more subjective risk factors answered, i.e. "Yes" or "No" in two or more of the following fields: contact with someone with similar symptoms; food from a food premises; consumed untreated water; recreational contact with water; contact with farm animals; contact with sick animals; overseas during incubation.

Those cases who were categorised as "Not Contacted" were re-sorted by the comments field and reviewed for statements which indicated contact with the case, e.g. "spoke to case"; "contacted case"; "rang case"; "case says"; "reviewed questionnaire"; and "reviewed, no source identified". Any case with comments which provided evidence of contact with the case was reclassified as "contacted".

Some cases were difficult to categorise especially when individual PHSs used a combination of contact systems, e.g. ringing the notified case to establish if they were in a high risk job, and then sending a questionnaire to complete the investigation.

This led to contradictory information such as some risk factor information in the comments field and no risk factors completed in the appropriate fields, or CRF risk factor fields completed and the comments field including notes such as there was "no response to letter/questionnaire" or "questionnaire not returned". This may have affected the accuracy of assigning a notification to "Contacted" versus "Not Contacted".

Completeness

One of the limitations of the EpiSurv database identified during the data collection phase relates to the use of the "Unknown" option. An HPO during an interview can choose between "yes", "no", or "unknown". The unknown option is often used if the case thinks they ate out at a food premises but can't remember where, or if their child was with other people and may have eaten out, or in the water section when they visited a rural address or bach but did not know the origin of the water they drank. However, if the HPO fails to complete or ask the question the incomplete data defaults to "Unknown". Thus an "Unknown" option can have several different interpretations making it difficult for analysis. This likely to be why subjective fields appear to have lower completion rates than other EpiSurv fields.

A custom EpiSurv report was designed to extract completeness data on the following fields: Date of Birth, Occupation, Ethnicity, Symptoms indicates clinical criteria, Onset Date, and all Risk Factors. Analysis of this report for completeness measured the "Unknown" data by making the assumption "Unknown" is a non- completed field.

Timeliness

Two fields have been added to the latest version of Episurv in the "Extra Details" section of the electronic version of the CRF. The fields are called "date investigation sent" and "date investigation received". These fields were used to measure time to contact over the trial period.

- Date investigation sent – the date the questionnaire was posted from the PHS
- Date investigation received – the date the questionnaire was returned to the PHS

Identification of Need for Further Public Health Action

Concerns around the ability of postal questionnaires to identify cases that might need additional public health action in a timely manner were raised. It was agreed by the steering group that the risk factor questions that would be most likely to identify potential sources requiring further investigation would be cases responding "Yes" to any of the following:

- Contact with other symptomatic people
- Consuming food from a food premises during the incubation period
- Consuming untreated water during the incubation period

The questionnaire was modified by adding the following alert:

If the ill person is one of a group of people who are or were sick call a Health Protection Officer immediately for advice on (06) 350 9110

The following internal and external response options were designed to manage the potential triggers for additional public health action as identified by the steering group above:

- **Internal response options**
  - Mailing of Educational information e.g. Household water supplies management booklet (5) to those identified with their own water supplies
  - Including onset date and information received from the interview or questionnaire on the local risk factor monitoring list i.e. name of local pool, food premises, or early childcare centre (ECC)
  - Internally reviewing other cases with possible commonalities to consider if an outbreak response should be considered
  - Reviewing EARS on a weekly basis to identify increases in case numbers either within MCPHS or our bordering PHSs
- **External response options**
  - Ringing cases or caregivers of cases who had completed and returned questionnaires for further information
  - Ringing sources identified by contacted cases, e.g. ringing a school or ECC identified by a questionnaire as having other illness, for information on other absenteeism
  - Contacting local authority to ask if there were other complaints or issues around a suspect food premises
  - Working with the local Environmental Health Officer (EHO) to address premises implicated through the reporting system
  - Emailing other PHSs to advise of food premises identified by cases which fell outside MCPHS region

3.2 Results

3.2.1 Results for Postal Questionnaire Return Rate

A total of 113 other enteric notifications were received from within the MCPHS region between 1 July 2007 and the 30 June 2008, over the trial period.

Table 4: Percentage of notified cases contacted during the trial period

Surveillance Method	Total	Phone	Questionnaire	Visit	Not Contacted	contacted
Other enterics using postal questionnaire	113	12*	60	1*	**53**	**53%**

*excluded from the trial as these notifications required immediate response i.e. multiple household contacts: *Salmonella Chester* outbreak identified through typing

Results of Postal Questionnaire Response Rate by NZ Deprivation 2006 Index

Out the 113 cases in the postal questionnaire trial 12 cases were not able to be assigned a meshblock in order to determine the NZ Deprivation 2006 index: 8 of these 12 had rural delivery addresses and the location of a further 3 cases using local maps confirmed they were also rural addresses. The effect of the missing data on this analysis is difficult to ascertain, except that fewer rural areas have high NZDep 2006 indices within the MidCentral region.

Although there appeared to be an association with cases living in higher deprivation areas having a lower response rate than expected, and cases living in lower deprivation areas having a higher response rate than expected, the difference did not reach statistical significance (p=0.38) - this may be a reflection of a small sample size.

However, it has been indicated in other studies, that cases living in lower deprivation areas would be more likely to return questionnaires than those living in higher deprivation areas (1, 11).

Results for Postal Questionnaire Response Rates and Rural Versus Urban Locality

The response rate for postal questionnaires was assessed to see if the location of the case (rural versus urban locality) had an effect on the response rate. Rural versus Urban locality was assigned using ArcGIS 9 classification. The same method using Chi-Squared test was applied as per the analysis for the effect of NZDep06 on observed versus expected response rate.

Although the results suggest that cases in rural localities are less likely to respond to postal questionnaires than expected, and those in urban localities are more likely to respond than expected, this difference did not reach statistical significance. (p=0.62).

Of note is that there were 12 cases for which a meshblock could not be determined: 8/12 were noted to have Rural Delivery addresses and three cases were located on a map as likely to be rural. Of the 12 cases not allocated as rural/urban, 8 were non-responders. This analysis allocated rural status to those cases with rural addresses and who were identified by a local map as from a rural locality.

Response Rate Compared with Other PHSs

Analysis of data from a comparable PHS identified that they used telephone interviews and postal questionnaires for gathering their surveillance data and this was consistent with what was reported during the survey of PHS (Refer Table 1) A combination of the methods highlighted in Table 1 were reported in the comments sections of EpiSurv for the rest of NZ.

The Contact Rates for the Postal Questionnaire Trial, a comparable PHS and NZ are presented in Table 5. The response rate of 53% was virtually the same as the 54% contact rate (estimated) for the rest of NZ. However, the response rate was significantly lower than the 87% (estimated) contact rate achieved by a similar sized PHS.

3.2.2 Results for Postal Questionnaire Completeness Rate

An EpiSurv report was run at the end of the trial to determine completeness of data entered into EpiSurv fields. This was compared to completeness data for a comparable PHS to MCPHS and to the completeness data for all New Zealand notifications for the same time period as the trial.

Table 5: Analysis of data collected from other enteric cases between 1 July 2007 and 30 June 2008 identified as "contacted" for NZ and a similar size PHS using local methods which may include: phone, visit, and questionnaire versus the MCPHS data collected via postal questionnaire over the same period

Question/EpiSurv Field	*Postal Questionnaire*	*Oth sim PHS*	*NZ (ex MCH)*
Date of Birth*	**100%**	**100%**	**99%**
Occupation*	**96%**	**93%**	**85%**
Ethnicity*	**100%**	**100%**	**92%**
Symptoms - indicates clinical criteria	**100%**	**99%**	**99%**
Onset Date*	**81%**	**92%**	**93%**
Contact with someone with a similar illness	**93%**	**84%**	**79%**
Consumed food from a food premise	**97%**	**87%**	**65%**
Consumed water from an untreated source	**93%**	**65%**	**62%**
Have Recreational contact with Water	**95%**	**89%**	**73%**
Contact with Farm Animals	**95%**	**95%**	**87%**
Contact with Sick Animals (diarrhoea)	**92%**	**82%**	**72%**
Overseas travel during the incubation time*	**95%**	**96%**	**87%**
Total Cases notified	**113****	**221**	**3967**
Total Cases contacted	**60**	**193**	**2136**
Total percentage of cases contacted	**53%**	**87%**	**54%**

** 13 cases excluded from postal trial due to alerts at notification or prior to Questionnaire's return

Table 6: Analysis of data from cases between 1 July 2007 and 30 June 2008 identified as " Not Contacted" for NZ and a similar size PHS

Question/EpiSurv Field	*Postal Questionnaire*	*Other similar PHS*	*NZ (except MCH)*
Date of Birth*	**100%**	**100%**	***99%***
Occupation*	**47%**	**75%**	***35%***
Ethnicity*	**33%**	**98%**	***45%***
Symptoms - indicates clinical criteria	**4%**	**92%**	***85%***
Onset Date*	**0%**	**54%**	***37%***
Contact with someone with a similar illness	**0%**	**0%**	***2%***
Consumed food from a food premise	**0%**	**0%**	***1%***
Consumed water from an untreated source	**9%**	**4%**	***1%***
Have Recreational contact with Water	**0%**	**4%**	***1%***
Contact Farm Animals	**0%**	**0%**	***0%***
Contact with Sick Animals (diarrhoea)	**0%**	**0%**	***0.20%***
Overseas travel during the incubation time*	**0%**	**4%**	***14%***
Total Cases notified	**113****	**221**	**3967**
Cases **Not** Contacted	**53**	**28**	**1831**
Total percentage of "Not Investigated"	**47%**	**13%**	**46%**

*Core EpiSurv data used for quality reporting

3.2.3 Results for Postal Questionnaire Timeliness

The questionnaires had a median return time of 6 days. The least time to return was 1 day and was due to case ringing the PHU to complete over the phone and one case (a hospital worker) returned the questionnaire in person to the PHS. Cases sent questionnaires over the Christmas/new year period were associated with longest delays in responding (56 days).

Table 7: Time in days to return postal questionnaire during the trial period

Surveillance Method	*Most days*	*Least days*	*Average*	*Median*
Postal questionnaires	56	1	10	6

3.2.4 Identification of Need for Further Public Health Action

Returned postal questionnaires were reviewed for triggers which required additional Public Health action. (Refer Section 3.1.3 Data Analysis Methods) Of the 60 returned questionnaires, 40 cases had answered "yes" to an identified trigger question. These were mostly managed with internal systems as highlighted below in Table 8.

Table 8: Triggers hit by postal questionnaires returned from notified cases of Giardiasis, Cryptosporidiosis, Yersiniosis, and Salmonellosis in the MCPHS region during the trial

Trigger fields	*Response*	*Questionnaires requiring further action*	*Action*
Consumption of food in a food premises during incubation period	Yes	29	**Internal:** food premises watch list
Consumption of untreated water during incubation period	Yes	22	**Internal:** Mailed a copy of booklet managing household water supplies
Contact with other symptomatic people	Yes	3	**Internal:** Reviewed information supplied
		2	**External**: Ring case, cases parent or implicated source i.e. childcare centre

3.3 Discussion

The review of 27 questionnaires identified a short Yes/No questionnaire (currently in use as a pre-screen by Regional Public Health) as having the most favourable layout for the trial. This questionnaire was enhanced and adapted by the steering group into 4 disease-specific questionnaires for notified sporadic cases of: "other enterics" received by MidCentral PHS. These were used for the postal questionnaire trial initiative (refer section 10.1 Cover Letter and Questionnaires Used During the Trial).

The results of the postal questionnaire trial were interesting because the response rate of 53% was lower than we expected based on feed back from the NZ PHU's. However, the result was greater than a similar enhanced surveillance study undertaken in Australia where a response rate (using postal questionnaires) of 49.2% was achieved over the study period (4). The contact rates for the rest of NZ (for the same diseases using multiple methods) was estimated at 54% this indicated our result was inline with contact rates being achieved across the country. However, the completeness of data for those cases who returned our questionnaire was higher, with the exception of onset date, than the results achieved by other NZ PHS (using their local methods). This indicates the use of the trial questionnaire did not result in a reduction of quality for data gathered, in fact, for those who responded we had good completeness of data (refer Table 5). Overall the questionnaire allowed us to gather good quality data from those who responded.

The results from the "not contacted" cases provide a potential picture of surveillance data quality in a scenario where no investigation of sporadic cases is undertaken at the

PHS level and as much information as possible is gleaned from the GP and lab notifications to complete the CRF in EpiSurv (refer 10.2 Protocols for Entering Data and the Trigger Tree). Cases were assigned as "not contacted" using the criteria outlined in Section3.1.3 Data Analysis Methods. These results suggest that the basic demographic information would remain reasonably complete in cases reported to Episurv, but source attribution information would be poor.

The median response time for our questionnaire was 6 days which was reasonable. However, the additional processes questionnaires went through once they were received in the PHS (such as reviewing the returned questionnaire, by an HPO, and administration staff logging the final data into Episurv) would have caused additional delays for reporting onto EpiSurv.

It was noted in the analysis of cases "not contacted" that the completeness of the field "symptoms - indicates clinical criteria" remains at high levels and this may indicate a lack of understanding relating to this field. Within MCPHS we only complete the field if we have information from the patient or doctor that they were symptomatic and meet clinical criteria for a case. The other reason for a high level of completeness in this section may be a better Primary and Public Health interface within other PHSs wherein this information is accessible or supplied by the health practitioner providing the notification.

The majority of returned questionnaires, which did hit alert questions (refer 3.2.4 Identification of Need for Further Public Health Action), gathered enough information to not require further contact with the case. There was no evidence that the questionnaire missed any potential linked cases. Two of the returned questionnaires were from cases later identified as part of the *Salmonella Chester* outbreak, and they were not identified as associated by the trial questionnaires. However, a national outbreak investigation was only able to link cases through strain typing of *Salmonella* cases and nationally no common source was identified.

Analysis of NZ Deprivation index 2006 and the locality of those sent questionnaires was tested and while neither result was of statistical significance there was an indication that those who live in more deprived areas or are from a rural location are less likely to respond to questionnaires. This could affect the representativeness of surveillance data collected via the postal method.

An analysis of locality of cases by meshblock in the MCPHS indicated notifications of enteric disease received were in line with the 18% rural and 82% urban spread within the region. Using the Arc GIS 9 classification of urban versus rural status the percentage of all other enteric cases in the trial identified as rural was 30% and urban 70%. Campylobacteriosis cases had a similar distribution: 23% rural and 77% urban. There is a suggestion that there is an over-representation of rural cases of common enteric diseases, especially other enteric, in the MidCentral region.

The NZ Deprivation 2006 Index quintiles were compared for the other enteric cases notified during the trial period with the percentage of the MidCentral DHB population in each quintile. Comparison between Figure 1 with Figure 2 shows that there were a larger proportion of cases notified from Quintile 1 and fewer in Quintile 2 but that in the higher deprivation quintiles, the percentage of notifications in each quintile was similar in proportion to the MidCentral population quintile distribution. The distribution of cases in indices 1-5 compared with 6-10 is in similar proportions to the overall MidCentral population.

Figure 1: Distribution of NZDep 06 index quintiles in the MidCentral DHB population

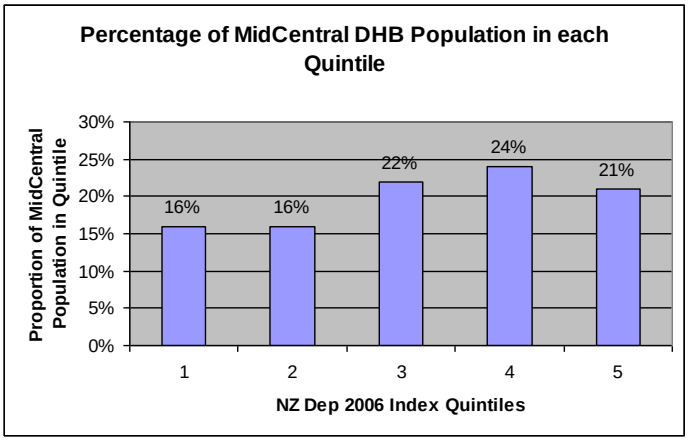
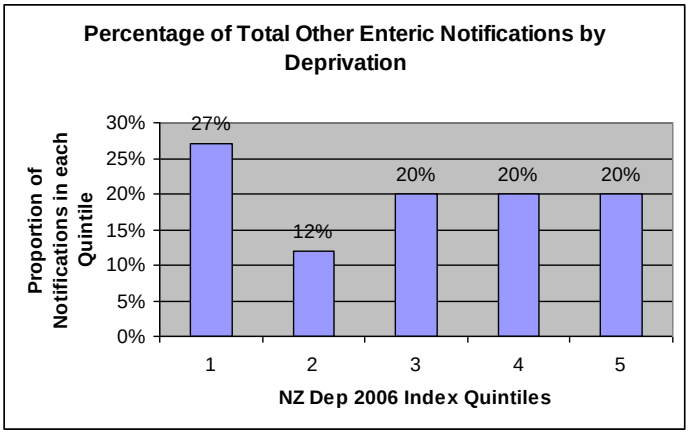


Figure 2: Distribution of NZDep 06 index quintiles for other enterics



4. Telephone Interview Trial for Campylobacteriosis cases

4.1 Methods

4.1.1 System of Telephone Interview

The majority of campylobacteriosis notifications received by MCPHS are directly from the local Medlab Central laboratory. These notifications are received by administration staff, who search hospital databases for NHI, current address and phone numbers. If staff are unable to find patient details they contact the relevant General Practice. Demographic information gathered is entered into the EpiSurv CRF. Those whose phone numbers could not be determined by administration staff receive a letter requesting the case contact the PHS.

All notified cases of Campylobacteriosis arising from the MCPHS region between 1 July 2007 and the 30 June 2008 were interviewed via telephone by Health Protection Officers (HPOs), except if the cases were hospitalised, then they were interviewed in person on the hospital ward. The interview was based directly on the EpiSurv Case Report Form.

It had been identified in the project plan (based on past notifications), that there was likely to be between 245 to 333 cases of Campylobacteriosis cases notified in the MCPHS region over the year of the trial.

4.1.2 Administration of Telephone Interview

Whenever possible case interviews were

- Completed between 3pm and 7pm on Tuesdays and Thursdays allowing a focused time with a maximum of 2 working days delay to follow up.
- Headsets and real time logging of information by HPOs directly into EpiSurv On-line was undertaken.
- Protocols around the interpretation of the cases information were followed.
- A Target of 3 working days from notification to closing cases was aimed for.
- If no current phone details were available, or after 3 failed telephone attempts we were unable to contact the case, letters were sent advising we were unable to contact them and requesting they ring the PHS.
- Answer phone messages were left on both landlines and or cellular phones, and text messages were also used. When we left a message we advised that MCPHS could call them back if they were using a mobile phone and would cover the costs.
- Education information packs were sent to all those contacted by phone and interviewed (unless they declined the offer during the interview), including information on managing household water supplies for those identified as not being on town supply.

4.1.3 Data Analysis Methods

Analysis of the telephone interview trial looked at contact rate, timeliness and completeness. Reports of these outcomes were run quarterly and at the conclusion of the trial. All reports were transferred into Microsoft Excel for analysis. All calculations were done using Excel functions and in particular the use of pivot tables. The same custom report was used as for the postal questionnaire trial (see section 3.1.3 Data Analysis Methods). Results were compared with the ESR other PHS data and with MCPHS pre-trial surveillance data.

Due to the high contact rate, the association with NZ Deprivation 2006 Index and rural versus urban locality was not examined. Otherwise the analysis methods were the same as for the postal questionnaire (see section 3.1.3 Data Analysis Methods).

It was intended to compare the trial outcomes with methods used prior to the trial commencement. However, we could not use data from the same time period 2005-2006 as our comparison, as campylobacteriosis surveillance had been enhanced as part of the *Campylobacter* in the Manawatu project from June 2006. Prior to June 2006, MCPHS used a combination of questionnaire and phone interview to follow up notifications.

A review of historical reporting by MCPHS to EpiSurv was undertaken for the period 1 July 2004 to 30 June 2005. Cases were assigned as "contacted" if there was an onset date stated and a "Yes" or "No" answer to two or more questions in the risk factor section (Refer Return Rate). The review identified 260 cases of campylobacteriosis with 58% assigned as contacted, with completeness between 70 –99% in fields measured[3]. Unfortunately, during this period of time the method of contact varied and was not recorded, so it is not possible to directly compare the historical method of contact with the trial data.

Prior to the beginning of the trial there was a significant change to EpiSurv with the launch of SURVINZ EpiSurv V 7.2.1 on 3 April 2007. This resulted in a changed format for the collected surveillance data and the start of recording investigation method. Prior to the implementation of EpiSurv 7.2.1 the method of follow-up used for notified cases was not recorded in the EpiSurv system. In addition, there was no provision in the previous EpiSurv format for recording questionnaire return/contact dates for notified cases.

4.2 Results

4.2.1 Results for Telephone Interview Contact Rate

The total number of Campylobacteriosis cases recorded for the MCPHS region over the trial period was 231. Nineteen cases were excluded as they were investigated by bordering PHSs and transferred across to MCPHS at a later date. There was a total of 212 cases notified from within the MCPHS region during the trial. Including 204 interviewed by telephone, 1 person requested (due to language difficulties) and responded to a questionnaire and 3 cases who were visited in the Palmerton North hospital wards. Only 4 of the cases notified locally to MCPHS over the trial period were not contacted as we were unable to locate them.

[3] The same fields were measured as listed in Table 3

A total of 212 campylobacteriosis notifications were received from within the MCPHS region over the trial period between 1 July 2007 and the 30 June 2008.

Table 9: **Percentage of notified cases contacted during the trial period**

Surveillance Method	Total	Phone	Questionnaire	Visit	Not Contacted	contacted
Campylobacteriosis using enhanced methods	**212***	204	1	3	4*	**97%**

* Over the trial time period EpiSurv recorded a total of 231 cases in the MCPHS region.19 were excluded from the trial as they were notified to other PHS and followed up using their local methods then transferred into to the MCPHS region at later dates.

4.2.2 Results for Telephone Interview Completeness Rate

An EpiSurv report was run at the end of the trial to determine completeness of data entered into EpiSurv fields. This was compared to completeness data for a comparable PHS to MCPHS and to the completeness data for all New Zealand notifications.

The comparable PHS used telephone interviews and postal questionnaires for gathering their surveillance data. Reporting in the comments section of EpiSurv indicated a combination of these systems was used for collecting their data. To determine if a case was "contacted" the same criteria were applied as outlined in Section 3.1.3 Data Analysis Methods.

Table 10: Analysis of data collected from cases between 1 July 2007 and 30 June 2008 identified as "contacted" for NZ and a similar size PHS using local methods which may include: phone, visit, and questionnaire versus the MCPHS data collected over the same period

Question/EpiSurv Field	*Phone interview*	*Other similar PHS*	*NZ (ex MCH)*
Date of Birth*	*100%*	*100%*	*99%*
Occupation*	*96%*	*90%*	*90%*
Ethnicity*	*99%*	*97%*	*93%*
Symptoms - indicates clinical criteria	*99%*	*100%*	*99%*
Onset Date*	*98%*	*73%*	*85%*
Contact with someone with a similar illness	*99%*	*95%*	*85%*
Consumed food from a food premise	*94%*	*97%*	*77%*
Consumed water from an untreated source	*97%*	*88%*	*69%*
Have Recreational contact with Water	*99%*	*97%*	*79%*
Contact with Farm Animals	*99%*	*100%*	*94%*
Contact with Sick Animals (diarrhoea)	*98%*	*92%*	*78%*
Overseas travel during the incubation time*	*99%*	*98%*	*88%*
Total Cases notified	*212*	*342*	*8298*
Total Cases contacted	***208***	***219***	***2214***
Total percentage of cases contacted	***97%***	***64%***	***27%***

Table 11: Analysis of data from cases between 1 July 2007 and 30 June 2008 identified as "Not Contacted" for NZ and a similar size PHS

Question/EpiSurv Field	*Phone interview*	*Other similar PHS*	*NZ (ex MCH)*
Date of Birth*	*100%*	*100%*	*99%*
Occupation*	*0%*	*36%*	*34%*
Ethnicity*	*25%*	*83%*	*27%*
Symptoms - indicates clinical criteria	*25%*	*98%*	*92%*
Onset Date*	*0%*	*42%*	*41%*
Contact with someone with a similar illness	*0%*	*2%*	*0.70%*
Consumed food from a food premise	*0%*	*5%*	*1.10%*
Consumed water from an untreated source	*0%*	*5%*	*0.50%*
Have Recreational contact with Water	*0%*	*5%*	*0.20%*
Contact Farm Animals	*0%*	*0%*	*0.20%*
Contact with Sick Animals (diarrhoea)	*0%*	*0%*	*0%*
Overseas travel during the incubation time*	*0%*	*3%*	*9%*
Total Cases notified	*212*	*342*	*8298*
Cases Not investigated	***4***	***123***	***6084***
Total percentage of "Not contacted"	***2%***	***35%***	***73%***

* Core EpiSurv data used for quality reporting

4.2.3 Results for Telephone Interview Timeliness

The telephone interviews had a median contact time of 2 days. The least time to contact was 0 days and the most was 28 days. While we only attempted to contact each case by telephone on 3 occasions, we left messages on answer machines and sent an "unable to contact you" letter requesting cases ring the PHS. Long delays were often associated with people returning from being away.

Table 12: Time in days to contact a notified case of Campylobacteriosis during the Trial Period

Surveillance Method	*Most days*	*Least days*	*Average*	*Median*
Telephone interviews	28	0	4	2

4.3 Discussion

The results from the telephone trial were in line with the targets set for the MCPHS with 97% of cases being contacted and completeness of the ESR CRF at between 94 to 100% (in fields measured) for contacted cases.

As with the postal trial, results from "not contacted" cases provides a potential picture of surveillance data quality in a scenario where no investigation of sporadic cases is undertaken at the PHS level, and as much information as possible is gleaned from the GP and lab notifications to complete the CRF in EpiSurv. These results suggest (as with the other enterics) the basic demographic information for Campylobacteriosis cases would have some level of completeness, but source attribution information would be poor.

Although contact rates from the telephone interviews were not assessed by NZDep 2006 index (as the response was so high overall), it is likely that telephone interview is more effective for cases living in higher deprivation index areas than postal questionnaires, especially when incorporating cellular phones and texting. This is supported, in part, by feedback from Northland PHS (during the PHS enteric disease data collection survey) that they have historically had poor response rates to questionnaires in their region (a region identified as proportionately higher needs population than the NZ population) and they are much more likely to contact people by mobile phone.

Overall the telephone interviews achieved a higher level of contact and achieved excellent completeness. Information was logged into Episurv as it was collected, meaning we were able to supply information at the national level in real time. The information gathered was truly representative of the notified cases as we contacted such a high number of them. This was mainly through utilising an early evening work shift, ringing cell phones and introducing texting to our surveillance toolbox.

5. EARS as a PHS Tool

Consideration was given to how MCPHS could address the response delay from other enterics during the postal questionnaire trial. It was identified by the steering group that MCPHS could utilise EARS as backup in identifying clusters of cases prior to the PHU being aware of them or receiving questionnaires back from notified cases.

5.1 Methods

The weekly updated EARS reports were assessed for increased activity or triggers with the aim of identifying:

- Disease clusters prior to the MCPHS identifying them
- Disease clusters identified prior to mail out responses being received
- Reporting on overall usefulness in a medium sized PHS environment

EARS reports were run weekly within MCPHS, on a Tuesday afternoon or after the weekly update by ESR.

Based on the activity rates the files for the notified cases which triggered the alerts were reviewed with the aim of identifying time/person/place commonalities using demographic information available prior to the dispatch or return of the questionnaire.

A regular common enteric disease meeting was initiated on Tuesday afternoons and triggered cases discussed with the MOH.

The trigger was set at the "historical limits" or the "CUSUM + Historical limits" flags being hit in the EARS weekly update for the MCPHS region. Further action was undertaken with the following steps:

1. Review of available demographic information on the CRF
2. If commonalities were identified then a telephone interview of cases would be undertaken

EARS for was monitored from week 47 ending 28/11/2006 to week 26 ending 1/07/08.

5.2 Results

5.2.1 Campylobacteriosis

The week prior to beginning EARS monitoring two campylobacter outbreaks had been identified. One linked to a school camp and children swimming in a pond after a heavy rain event and one linked to a undercooked chicken pie served by a caterer at a 70th birthday function. Both outbreaks were identified from telephone interviews with single notified cases and the resulting trigger CUSUM + historical limit flags were raised by additional cases identified by the HPO's investigating the outbreaks being logged into EpiSurv.

The 3 historical limit flags were raised in the 3 weeks preceding the outbreaks described above and were associated with the ongoing identification of cases on top of a typical seasonal peak at this time of year.

5.2.2 Cryptosporidiosis

CUSUM flags were hit with between 1 -4 cases notified in a single week. The CUSUM + historical limits flag was triggered 7 times with 1 historical limit flag and 2 CUSUM in a 17 week period when 17 cases were notified over the period. No linking factor was identified for these cases - they were most likely to be associated with animal contact (calves). Increased rates were identified around the country, using EARS, over the same time period.

5.2.3 Giardiasis

CUSUM flags were hit by between 2 – 4 cases notified in a single week and the CUSUM + Historical Limits was hit twice when 3 cases a week were notified over a three week period. A family outbreak involving 3 cases was identified by the MCPHS and the other cases were spread through the region.

5.2.4 Salmonellosis

The CUSUM flags were all raised by 1 or 2 cases - the exception was 3 cases notified in a single week which only triggered a CUSUM. However, three cases notified in the following week flagged a CUSUM+Historical limit flag and 2 cases were identified, by typing, as part of the Salmonella Chester outbreak.

5.2.5 Yersiniosis

The majority of the 10 CUSUM flags were raised by single notified cases over the monitoring period. None of these cases were identified as part of an outbreak.

Table 13: Flags raised in the EARS system over the period of the monitored period 28/11/06 to 1/07/08

Disease	CUSUM	Historical limits	CUSUM +Historical limits
Campylobacteriosis	5	3	1
Cryptosporidiosis	7	1	8
Giardiasis	14	3	2
Salmonellosis	12	3	2
Yersiniosis	10		
Total	**48**	**10**	**13**

5.2.6 Opportunities for using EARS Identified During the Monitoring Period

- Graphs from EARS were used in a number of seminars and training sessions given by MCPHS staff
- Quick reference for media enquiries, regarding numbers of Listeriosis cases in both ours and surrounding regions, associated with the large recall of locally produced smoked chicken breasts which had been found to be contaminated with Listeria
- Reduced analysis related work by PHS staff as we were able to retrieve information in a timely manner without running reports and comparing results or requesting information from other PHS or ESR.

5.3 Discussion

The database was user friendly and was utilised as a quick reference tool for media enquiries and assessing the disease rates in bordering PHS. The database supplied back up information on disease rates for questionnaires not yet returned or not responded to.

One of the limitations of EARS noted, during retrospective data analysis, is the flags change as new data is logged into EARS. For example a CUSUM may be triggered one week if the following weeks data triggers a Historical limit the previous weeks flag may also change from a CUSUM to a Historical limit. This may have affected data as retrospective hard copy reports, we had down loaded every week, were used for analysis.

All increases in disease were noted in the MCPHS prior to being triggered in EARS system. No outbreaks were identified by EARS flags. However, EARS was utilised in the MCPHS for the following over the 12 months of the trial:

- Assessing increased disease rates nationally
- Assessing and comparing our disease rates with bordering PHS
- Triggered reviews of files
- Presented EARS graphs at training and lectures given by MCPHS, EARS graphs are excellent visual aids and are easily read
- Gave us the ability to retrieve information in a timely manner without running reports or comparing results through EpiSurv. Reduction of analysis related work by frontline staff

6. Postal Versus Telephone Data Collection Discussion Using WHO Framework

Overall the results indicated that when a case is contacted (either by phone or the return of a questionnaire) PHSs achieve a higher level of completeness and gather better quality data, particularly in the area of source attribution data, than when no contact is made with the case and only the information gleaned from a laboratory or GP notification is logged in EpiSurv.

Using telephone interviews we were able to contact 44% more cases than the mail questionnaires. However, while the return rate for postal questionnaires was lower, the quality/completeness remained at a high level when compared to the rest of NZ.

The World Health Organisation (WHO) has identified key components when evaluating the quality of a surveillance system as (12):

- Completeness
- Timeliness in notification and reporting
- Usefulness of surveillance data
- Representativeness
- Usefulness of surveillance data in identifying alerts
- Simplicity
- Acceptability of the system

These quality components for surveillance are considered in the following discussion on the outcomes of the enhanced surveillance trial.

6.1 Completeness

Completeness of data was measured for campylobacteriosis cases contacted by telephone in the MCPHS region and ranged between 94 – 100%. This level of completeness was similar to the percentages achieved within a comparable PHS at 73 – 100% but consistently higher, through the fields measured, than the rest of NZ at 69 – 99% (refer Table 10).

Completeness of data for other enterics using the postal questionnaire in the MCPHS region remained high ranging between 81 – 100%. However, while the comparable PHS achieved a better contact rate, 87 % versus our 53%, the completeness was lower ranging between 65 – 100%. While the MCPHS contact rate using the postal questionnaire was similar to the rest of NZ, the MCPHS field completeness was consistently higher than identified for all PHSs, which ranged between 62 – 99%. However, completeness will decline when both "contacted" and "not investigated" are combined.

One of the interesting outcomes from the completeness data was around the core data fields also used by ESR to measure completeness: Age, Date of Birth, Ethnicity, sex, NHI, Occupation. The levels of completeness remain high in these fields even for cases who are not contacted. This indicates much of this information is received or gathered at the time of notification prior to entering it into EpiSurv. The data most affected when cases are not contacted is clearly highlighted as the risk factors information and information associated with source attribution (refer Table 6 & Table 11).

6.2 Timeliness

The most timely method used in the MCPHS trial was telephone interviews with a contact time ranging between 0 – 28 days; an average contact time of 4 days and a median contact time 2 days. This demonstrates that the 3 working day target was met using this system. By comparison the postal questionnaire had a response range of 1 -56 days, with an average of 10 and a median of 6 days. We were unable to measure the timeliness on a national level as there was not comparable data.

6.3 Usefulness

The review of reporting systems and data collection methods used throughout NZ PHSs clearly identified there are a range of collection methods being used for enteric disease surveillance in NZ. Within the PHSs surveyed there are further inconsistencies as HPOs and TLAs (if called upon) can choose which system they use for reporting for their geographical region. The four systems identified were: education, information and cover letter; telephone interviews; postal questionnaire; and face to face visits. Some PHS contact the case by phone to establish occupation and then forward a questionnaire. During the telephone survey with PHSs, return rates for postal questionnaires were estimated by those using them at between 50 – 70 %. While EpiSurv 7.2.1 has provision to record this information in the "extra details" section, neither MCPHS nor other PHSs surveyed were identified as using this additional section or any other formal method to record return rates of questionnaires.

An issue that may limit the utilisation of either the free fields or "date investigation sent" and "date investigation received" fields is that they are contained in a separate section to the CRF. This section is not automatically printed out on the hard copy form and the hard copy of a CRF is often used within PHSs to complete case investigations.

The review of 27 questionnaires used for investigating enteric diseases identified that a number of PHSs used quite detailed questionnaires. Potentially a simple 2 page questionnaire could be used to complete the requirements of an EpiSurv CRF (refer 10.4 EpiSurv Enteric Disease Case Report Form). To this end a pre screen questionnaire from Regional Public Health Wellington was successfully adapted as a postal questionnaire for use during the trial.

Inconsistencies in reporting methods are likely to bias potentially valuable risk factor and source attribution data towards the null. For research at the PHS or national level, risk factor/source attribution data is likely to be inaccurate or inconclusive e.g. if larger centres do not collect certain information then the amount of data is significantly reduced. The lack of risk factor data is highlighted in the outcomes of those "not contacted" (refer Table 6 & Table 11).

Although consistency is not one of the specific WHO criteria for a surveillance system, we believe a particular strength of the trial is attributable to the development of and adherence to protocols around how we interviewed cases and entered data into EpiSurv. (Refer10.2 Protocols for Entering Data and the Trigger Tree).

Commitment from the EpiSurv coordinator, HPOs and the MOH in using the agreed protocols, especially around the use of the "unknown" field, was key in maintaining consistency of data collection between HPOs undertaking the telephone interviews.

The strength of these protocols was further supported when a recent graduate HPO was employed at MCPHS and undertook a large percentage of the telephone interviews at the beginning of 2008. The results in the following quarter remained unchanged. Use of protocols around interpretation of collected information ensures consistent and reproducible surveillance information, even when different individuals are collecting and entering data.

The usefulness of collecting good quality data from the majority of notified cases has been highlighted by the way the MCPHS data on campylobacteriosis has been used in the Campylobacter in the Manawatu study (3,6). It is also likely that the information gathered over the enhanced surveillance trial will continue to support research at a national level for some time yet.

6.4 Representativeness

Using different reporting methods within local PHS affects the representativeness of the data being collected in EpiSurv at a national level. Attempting to inform public health response at a national level or attempting to combine PHS data using current risk factor data is unlikely to give a representative picture.

The contact rate for telephone interviews (campylobacteriosis) was significantly higher at 97% compared to 53% of the mail questionnaires. This was also significantly higher than the comparable PHS at 64% and the rest of NZ at 27% (both using a combination of data collection methods). The response rate of 53% for other enterics using postal questionnaires alone was in line with 54% for the rest of NZ, but significantly lower than the 87% achieved by the comparable PHS (refer Table 5 & Table 10). Overall the analysis indicated only 2% of campylobacteriosis cases were not contacted in the MCPHS area compared to 73% of the cases not being contacted in the rest of NZ. MCPHS had 47% "not contacted" other enteric notified cases by postal questionnaire, and this was similar to the number "not contacted" nationally at 46%.

The geographical spread of interviews undertaken and postal questionnaires received showed a good spread across the region. Although the non responders/not contacted cases in the questionnaire trial were also evenly spread through the region there is a potential that rural locality is associated with less likelihood of response. The method of data collection could potentially affect the representativeness of contacted cases. For example postal questionnaires may be less successful than telephone interviews for gathering surveillance information from cases living in higher deprivation areas.

6.5 Usefulness in identifying alerts

One of the key concerns for MCPHS using the postal questionnaires was the timely recognition of outbreaks which could be compromised by the additional delay when using the postal questionnaire. Information was clearly included requesting that groups of sick people should ring the PHS immediately. During the postal questionnaire trial, 2 phone calls were received in response to this request and in both cases the infections were most likely associated with person to person spread.

Alerts/triggers indicating the need for additional public health action to reduce further illness were identified for postal questionnaire responses as: other symptomatic people, food eaten from a food premises in the incubation period, and consuming untreated water. During the trial, 29 food premises were logged into EpiSurv and the MCPHS source watch list against week of onset. There were 22 household water supply booklets posted out during the trial. Three cases were contacted by phone due to triggers (contact with other symptomatic people) but did not require further follow up.

Two telephone calls were made one to a parent and one to an ECC regarding other symptomatic children.

These results indicate the triggers identified in our system were quite sensitive, but the associated work could be easily managed with internal systems. No outbreaks were identified over the year of the trial by postal questionnaires. Two of the cases associated with the *Salmonella Chester* outbreak did complete questionnaires and were not identified as associated. However, the national outbreak investigation was also unable to identify a common source. It is believed that the screening questionnaire would have been sensitive enough to identify any potentially linked cases.

6.6 Simplicity and acceptability

While MCPHS used telephone headsets and direct entry for logging campylobacteriosis data directly into EpiSurv in real time during the telephone interviews, it was identified that the current CRF needed a call centre friendly front end. Ideally this would only show questions that would relate to a case being interviewed, including caregiver/parents name and the option of free fields for additional questions of concern at a local level. The current form is too cluttered with technical and case management fields to be easily navigated while on the telephone.

While MCPHS believes direct entry is the most efficient and effective method to log data it is unlikely to continue in the future or until EpiSurv is modified given the issues highlighted above. Instead we are currently developing a 1-2 page telephone screening form based on the postal questionnaire format, with all the case related questions contained in it. This is likely to result in less timely data entry of this information into the EpiSurv system, than using direct entry during the telephone interview.

Postal questionnaires also involve more human resource than the Telephone interviews,. They require that a letter be sent to each case, mail packs be compiled, and the questionnaire when returned is reviewed and then logged into EpiSurv. In addition to telephone interviews being more efficient, we believe that the early evening timing of phone calls was successful in reducing time spent by HPO's attempting to contact cases and overall appeared to reduce time spent on follow up.

One of the core changes to the approach taken by HPOs during the Telephone interviews was to remove the focus from a source-searching conversation with a notified case, to advising cases there was a short "standard questionnaire to complete with them". This re-focusing of the interview reduced the overall time taken to interview. Moving to a standard questionnaire format gives more scope for well trained support staff to undertake the interviews rather than solely relying on HPOs.

HPOs face fluctuating reactive workloads subject to staffing levels within PHSs and the demands of both the community in which they work and the agencies they report to. The follow up of common enteric disease notifications is often one of the areas most likely to suffer due to high reactive workloads. This may be one of the key reasons PHSs have utilised their support staff and developed questionnaires to contact notified cases of common enteric diseases.

This trial indicates that contact rates, timeliness and completeness of common enteric disease reporting to EpiSurv could be significantly improved through delivery of a short telephone pre-screen questionnaire by well trained support staff, possibly an extension of the EpiSurv coordinators role, to collect basic EpiSurv data. This would allow HPOs to focus their skills on the cases who trigger alerts and may require further investigation.

7. Conclusions

The aims of the enhanced surveillance project were achieved in that:

1. MCPHS with the support of the enhanced surveillance project steering group has successfully established a demonstration PHS in which new methods and surveillance processes have been trialled and evaluated.

2. We have developed consistency in both data collection and management of notified foodborne disease within the MCPHS region by:

    a. Demonstrating the ability of a screening questionnaire to collect all requested enteric disease surveillance data, including good completeness of risk factor data.

    b. Developing a standard protocol for enteric disease surveillance data collection which can be promoted for use in other PHSs to improve the consistency of data collection.

    c. Demonstrating excellent contact rates and completeness being achieved through the use of telephone administered questionnaires and incorporating early evening contact.

    d. Using additional fields provided by ESR within EpiSurv to assist with gathering of data at a local level utilising the EpiSurv data base to store this information.

    e. Utilising the date "sent for investigation" and "date investigation received" fields introduced by ESR at a local level -within MCPHS - to measure time from receipt to contact or return of questionnaires.

3. MCPHS aims to continue to use systems developed during the project:

    a. Developing a short paper based telephone pre-screening survey (based on the postal questionnaire used during the project) which completes all of the EpiSurv fields (Refer 10.3 Draft 2 Page Telephone Screening Form to be Trialled by MCPHS).

    b. Appointing a 0.2 FTE technical officer for a 6 week trial period to undertake telephone delivery of the questionnaire for notified campylobacteriosis and other enteric cases in an early evening work shift twice a week. Cases identified as triggering alerts will be passed to HPOs.

4. The MCPHS has improved quality of local common enteric disease surveillance. This improvement in quality can be used to support research projects. An example of this is the high quality epidemiological information relating to Campylobacteriosis cases supplied to the "Human Campylobacteriosis in the Manawatu" project.(2).

The research undertaken within the MCPHS overall has given greater understanding of the value of quality reporting to those at the coal face and the lessons learnt over the two year trial, combined with the results of the enhanced surveillance project, will be used as the basis of a thesis for an HPO to complete a Masters in Veterinary Public Health with the Massey University, Hopkirk Research Institute (due to be completed end of 2008 beginning of 2009).

8. Recommendations

The recommendations have been broken down according to relevant agencies

NZFSA

1. MCPHS continues to be utilised and funded as a sentinel surveillance site for enhanced surveillance to support ongoing (potentially foodborne) enteric disease research.

Ministry of Health

2. Consideration is given to supporting MCPHS to continue to be utilised as a sentinel surveillance site for enhanced surveillance to support ongoing enteric disease research

3. Scoping is undertaken, at a national level, to assess the implementation of a basic questionnaire/pre-screen delivered via telephone from either a single or multiple sites to notified enteric disease cases. This would ensure consistency, and those cases who trigger further follow up would be forwarded to local HPOs in a timely manner.

4. A standard national questionnaire is developed (ideally including additional free fields that could be used for research projects) and an annual target for completion of questionnaires within each PHS is agreed on.

5. A national agreement is made around the percentage of cases contacted annually and the quality and quantity of data, gathered from within each region, with an aim to gather a more representative sample of data from across NZ e.g. targets set for each region.

ESR

6. Agencies work together to develop a call- centre friendly front end of EpiSurv to allow for real time logging of surveillance data for those PHSs who choose to use the telephone for following up cases.

7. A "Not contacted" or leaving the field blank option is included in all EpiSurv fields to remove the ambiguity around the "unknown" option in analysis of EpiSurv data

8. More training and feedback is undertaken to support HPOs developing a greater understanding of: the value of data collected; the importance of the way the data is reported to EpiSurv; and the importance of this tool for learning about the aetiology of potentially foodborne diseases at local, national and international levels.

Public Health Services

9. For initial contact for cases of notified common enteric disease, consider administering a short screening questionnaire by telephone with questions (alerts) which could indicate the need for further follow up.

10. Adopt agreed national protocols around consistent gathering of data and reporting to EpiSurv.

MCPHS – Local level

11. Scoping is undertaken at the interface between General Practice and the PHS with the aim of improving the demographic data received at the time of case notification to the PHS. The aim is to reduce time taken in gathering demographic information.

12. A Technical Officer is employed on a part time basis to manage notified sporadic common enteric disease in a timely manner. Utilising a short standardised questionnaire (for initial contact) the work could continue unaffected by the emergent event s within the PHS that can shift the focus of HPOs.

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10. Appendices

10.1 Cover Letter and Questionnaires Used During the Trial

XXXXXXXXXXXXXX
XXXXXXXXXXXXXX
PALMERSTON NORTH

XX XXX 2007

Dear XXXXX

Notification of XXXXXXXXX illness

The Public Health Services have been notified that you/your child has tested positive to the above illness.

We have enclosed information for you on the illness. We would appreciate it if you could take the time to complete the enclosed questionnaire relating to how you or your child may have contracted this illness in the community. While you do not have to supply the information requested in the questionnaire your participation is important to us to help monitor and reduce the levels of disease in our region. Any personal or identifying information you supply to us will remain confidential to the Public Health Services.

Once we have received your completed questionnaire we may give you a ring to discuss any further investigation that Public Health may undertake to prevent others becoming unwell.

Work, Childcare, and School Exclusions:

If you are in a high risk occupation i.e. an occupation where you deal with food prepared for others, a childcare centre, hospital or health care facility please remain home while you are symptomatic and **do not return to work until one whole day (24 hours)** after symptoms (i.e. diarrhoea/vomiting) have stopped.

If it is your child who is unwell they should **remain home from school or daycare until at least one whole day (24 hours)** has passed since symptoms (i.e. diarrhoea/vomiting) have stopped. **Do not swim in public pools until two weeks after symptoms have finished**

A person who has this infection can continue to excrete the bugs which caused the illness for a number of weeks after they become well, so keeping up good hand washing is vital.

We would appreciate it if you could return the enclosed questionnaire as soon as possible and if you have any queries or would like further help to complete the form please contact the duty Health Protection Officer on 06 350 9110.

Kind Regards

Tui Shadbolt
Health Protection Officer
PUBLIC HEALTH SERVICES

MidCentral Health

EpiSurv Number_____

CRYPTOSPORIDIUM QUESTIONNAIRE

NAME - of ill person: _____

CONTACT NUMBERS: Home ( )_____ **Work** ( ) _____ **Mobile** ( )_____

DATE OF BIRTH: ____/____/____ **SEX:** ❑ **Male** ❑ **Female**

PLACE of work/school/childcare: **1.** _____

2. _____

OCCUPATION: *(Please be specific and include any part time jobs)*

_____

If the ill person is one of a group of people who are or were sick call a Health Protection Officer immediately for advice on (06) 350 9110

ETHNICITY *(tick all that apply)* ❑ **NZ European** ❑ **Maori** ❑ **Samoan** ❑ **Cook Island Maori** ❑ **Niuean** ❑ **Chinese** ❑ **Indian** ❑ **Tongan** ❑ **Other**_____***(specify)***

Tick the symptoms you/your child had when you visited the Doctor:

Diarrhoea ☐ Stomach pain ☐ Vomiting ☐ No Symptoms ☐ Other _____

Use the calendar, work out what day you/your child became ill and write it here ____/____/____
Work backwards 14 days before the illness started. The questions below relate to this 14 day period.

In the 14 days before you/your child became ill did you/your child do any of the following?

- Have contact with anyone who had a similar illness? Yes ❑ No ❑
- Have food from a restaurant/bar/café/deli/takeaway or at a gathering? Yes ❑ No ❑
  If yes please complete table on back of form
- Drink water other than mains/town supply? Yes ❑ No ❑
  If yes please complete table on back of form
- Go swimming or have contact with water in a river, lake, stream or public pool? Yes ❑ No ❑
  If yes please complete table on back of form
- Have contact with farm animals Yes ❑ No ❑
- Have contact with animals with diarrhoea Yes ❑ No ❑
- Visit an overseas country? ***(if yes list countries visited on reverse)*** Yes ❑ No ❑
- If you have any comments or further information for us please turn over

NAME - of person completing form if different from above

_____

THANK-YOU FOR YOUR ASSISTANCE

Details included below are for the fourteen days prior to yours or your child's illness starting:

Name of place food consumed	**Address of place**	**Date food consumed**	**Food eaten**
Name of place water consumed	**Address of place**	**Date you drank water**	**Type e.g. Tank, bore, spring**
Name of place you had contact with water	**Address (approx is ok)**	**Date you had contact with water**	**Type of contact e.g. swimming, fishing boating**
Countries visited	**Date entered**	**Date departed**	**Date arrived in NZ**

Comments:

Once you have completed the form please return in the pre-paid envelope

Thank you for providing us with additional information. We may give you a call if we have any further questions

MidCentral Health

EpiSurv Number_____

GIARDIA QUESTIONNAIRE

NAME - of ill person: _____

CONTACT NUMBERS: Home ( )_____ **Work** ( ) _____ **Mobile** ( )_____

DATE OF BIRTH: ____/____/____ **SEX:** ❑ **Male** ❑ **Female**

PLACE of work/school/childcare: **1.** _____

2. _____

OCCUPATION: *(Please be specific and include any part time jobs)*

_____

If the ill person is one of a group of people who are or were sick call a Health Protection Officer immediately for advice on (06) 350 9110

ETHNICITY *(tick all that apply)* ❑ **NZ European** ❑ **Maori** ❑ **Samoan** ❑ **Cook Island Maori** ❑ **Niuean** ❑ **Chinese** ❑ **Indian** ❑ **Tongan** ❑ **Other**_____***(specify)***

Tick the symptoms you/your child had when you visited the Doctor:

Diarrhoea ☐ Stomach pain ☐ Vomiting ☐ No Symptoms ☐ Other _____

Use the calendar, work out what day you/your child became ill and write it here ____/____/____
Work backwards 14 days before the illness started. The questions below relate to this 14 day period.

In the 14 days before you/your child became ill did you/your child do any of the following?

- Have contact with anyone who had a similar illness? Yes ❑ No ❑
- Have food from a restaurant/bar/café/deli/takeaway or at a gathering? Yes ❑ No ❑
  If yes please complete table on back of form
- Drink water other than mains/town supply? Yes ❑ No ❑
  If yes please complete table on back of form
- Go swimming or have contact with water in a river, lake, stream or public pool? Yes ❑ No ❑
  If yes please complete table on back of form
- Have contact with farm animals Yes ❑ No ❑
- Have contact with animals with diarrhoea Yes ❑ No ❑
- Visit an overseas country? ***(if yes list countries visited on reverse)*** Yes ❑ No ❑
- If you have any comments or further information for us please turn over

NAME - of person completing form if different from above

_____

THANK-YOU FOR YOUR ASSISTANCE

Details included below are for the fourteen days prior to yours or your child's illness starting:

Name of place food consumed	**Address of place**	**Date food consumed**	**Food eaten**
Name of place water consumed	**Address of place**	**Date you drank water**	**Type e.g. Tank, bore, spring**
Name of place you had contact with water	**Address (approx is ok)**	**Date you had contact with water**	**Type of contact e.g. swimming, fishing boating**
Countries visited	**Date entered**	**Date departed**	**Date arrived in NZ**

Comments:

Once you have completed the form please return in the pre-paid envelope

Thank you for providing us with additional information. We may give you a call if we have any further questions

MidCentral Health

EpiSurv Number_____

YERSINIA QUESTIONNAIRE

NAME - of ill person: _____

CONTACT NUMBERS: Home ( )_____ **Work** ( ) _____ **Mobile** ( )_____

DATE OF BIRTH: ____/____/____ **SEX:** ❑ **Male** ❑ **Female**

PLACE of work/school/childcare: **1.** _____

2. _____

OCCUPATION: *(Please be specific and include any part time jobs)*

_____

If the ill person is one of a group of people who are or were sick call a Health Protection Officer immediately for advice on (06) 350 9110

ETHNICITY *(tick all that apply)* ❑ **NZ European** ❑ **Maori** ❑ **Samoan** ❑ **Cook Island Maori** ❑ **Niuean** ❑ **Chinese** ❑ **Indian** ❑ **Tongan** ❑ **Other**_____***(specify)***

Tick the symptoms you/your child had when you visited the Doctor:

Diarrhoea ☐ Stomach pain ☐ Vomiting ☐ No Symptoms ☐ Other _____

Use the calendar, work out what day you/your child became ill and write it here ____/____/____
Work backwards 7 days before the illness started. The questions below relate to this 7 day period.

In the 7 days before you/your child became ill did you/your child do any of the following?

- Have contact with anyone who had a similar illness? Yes ❑ No ❑
- Have food from a restaurant/bar/café/deli/takeaway or at a gathering? Yes ❑ No ❑
  If yes please complete table on back of form
- Drink water other than mains/town supply? Yes ❑ No ❑
  If yes please complete table on back of form
- Go swimming or have contact with water in a river, lake, stream or public pool? Yes ❑ No ❑
  If yes please complete table on back of form
- Have contact with farm animals Yes ❑ No ❑
- Have contact with animals with diarrhoea Yes ❑ No ❑
- Visit an overseas country? ***(if yes list countries visited on reverse)*** Yes ❑ No ❑
- If you have any comments or further information for us please turn over

NAME - of person completing form if different from above

_____

THANK-YOU FOR YOUR ASSISTANCE

Details included below are for the seven days prior to yours or your child's illness starting:

Name of place food consumed	Address of place	Date food consumed	Food eaten
Name of place water consumed	**Address of place**	**Date you drank water**	**Type e.g. Tank, bore, spring**
Name of place you had contact with water	**Address (approx is ok)**	**Date you had contact with water**	**Type of contact e.g. swimming, fishing boating**
Countries visited	**Date entered**	**Date departed**	**Date arrived in NZ**

Comments:

Once you have completed the form please return in the pre-paid envelope

Thank you for providing us with additional information. We may give you a call if we have any further questions

MidCentral Health

EpiSurv Number_____

SALMONELLA QUESTIONNAIRE

NAME - of ill person: _____

CONTACT NUMBERS: Home ( )_____ **Work** ( ) _____ **Mobile** ( )_____

DATE OF BIRTH: ____/____/____ **SEX:** ❑ **Male** ❑ **Female**

PLACE of work/school/childcare: **1.** _____

2. _____

OCCUPATION: *(Please be specific and include any part time jobs)*

_____

If the ill person is one of a group of people who are or were sick call a Health Protection Officer immediately for advice on (06) 350 9110

ETHNICITY *(tick all that apply)* ❑ **NZ European** ❑ **Maori** ❑ **Samoan** ❑ **Cook Island Maori** ❑ **Niuean** ❑ **Chinese** ❑ **Indian** ❑ **Tongan** ❑ **Other**_____***(specify)***

Tick the symptoms you/your child had when you visited the Doctor:

Diarrhoea ☐ Stomach pain ☐ Vomiting ☐ No Symptoms ☐ Other _____

Use the calendar, work out what day you/your child became ill and write it here ____/____/____
Work backwards 3 days before the illness started. The questions below relate to this 3 day period.

In the 3 days before you/your child became ill did you/your child do any of the following?

- Have contact with anyone who had a similar illness? Yes ❑ No ❑
- Have food from a restaurant/bar/café/deli/takeaway or at a gathering? Yes ❑ No ❑
  If yes please complete table on back of form
- Drink water other than mains/town supply? Yes ❑ No ❑
  If yes please complete table on back of form
- Go swimming or have contact with water in a river, lake, stream or public pool? Yes ❑ No ❑
  If yes please complete table on back of form
- Have contact with farm animals Yes ❑ No ❑
- Have contact with animals with diarrhoea Yes ❑ No ❑
- Visit an overseas country? ***(if yes list countries visited on reverse)*** Yes ❑ No ❑
- If you have any comments or further information for us please turn over

NAME - of person completing form if different from above

_____

THANK-YOU FOR YOUR ASSISTANCE

Details included below are for the three days prior to yours or your child's illness starting:

Name of place food consumed	**Address of place**	**Date food consumed**	**Food eaten**
Name of place water consumed	**Address of place**	**Date you drank water**	**Type e.g. Tank, bore, spring**
Name of place you had contact with water	**Address (approx is ok)**	**Date you had contact with water**	**Type of contact e.g. swimming, fishing boating**
Countries visited	**Date entered**	**Date departed**	**Date arrived in NZ**

Comments:

Once you have completed the form please return in the pre-paid envelope

Thank you for providing us with additional information. We may give you a call if we have any further questions

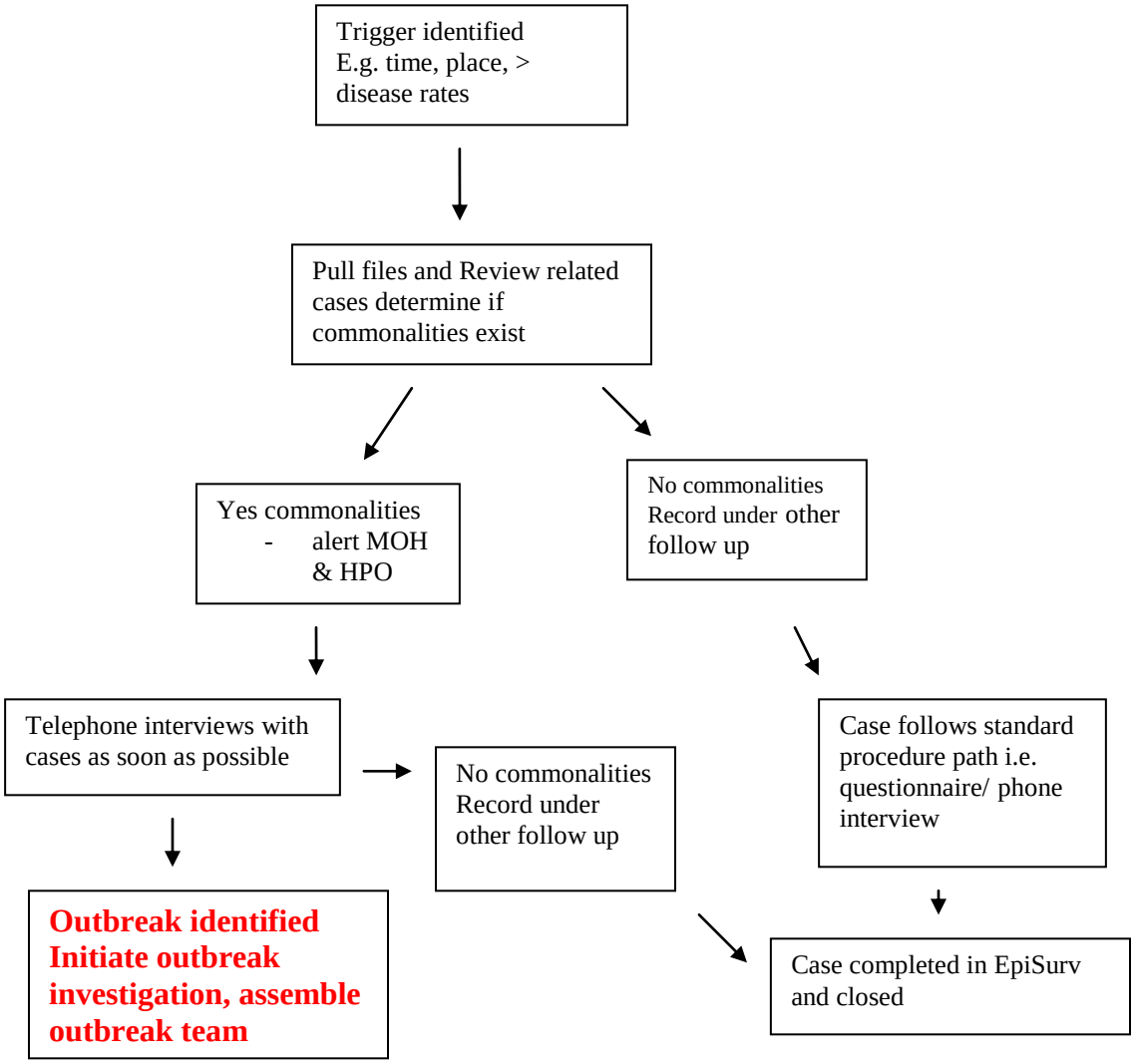
10.2 Protocols for Entering Data and the Trigger Tree

Procedure for Responding to Early Enteric Disease Triggers

Definition of an early Trigger

Aim - An early trigger should initiate timely investigation allowing swift Public Health intervention if required.

An early trigger - prior to case interview or questionnaire response - may be identified either through EARS or an educated hunch based on information supplied when reported to PHU – either from Dr, support staff or HPO reviewing cases it is likely to be based on demographic information such as place/age and or time increased levels of the same disease.



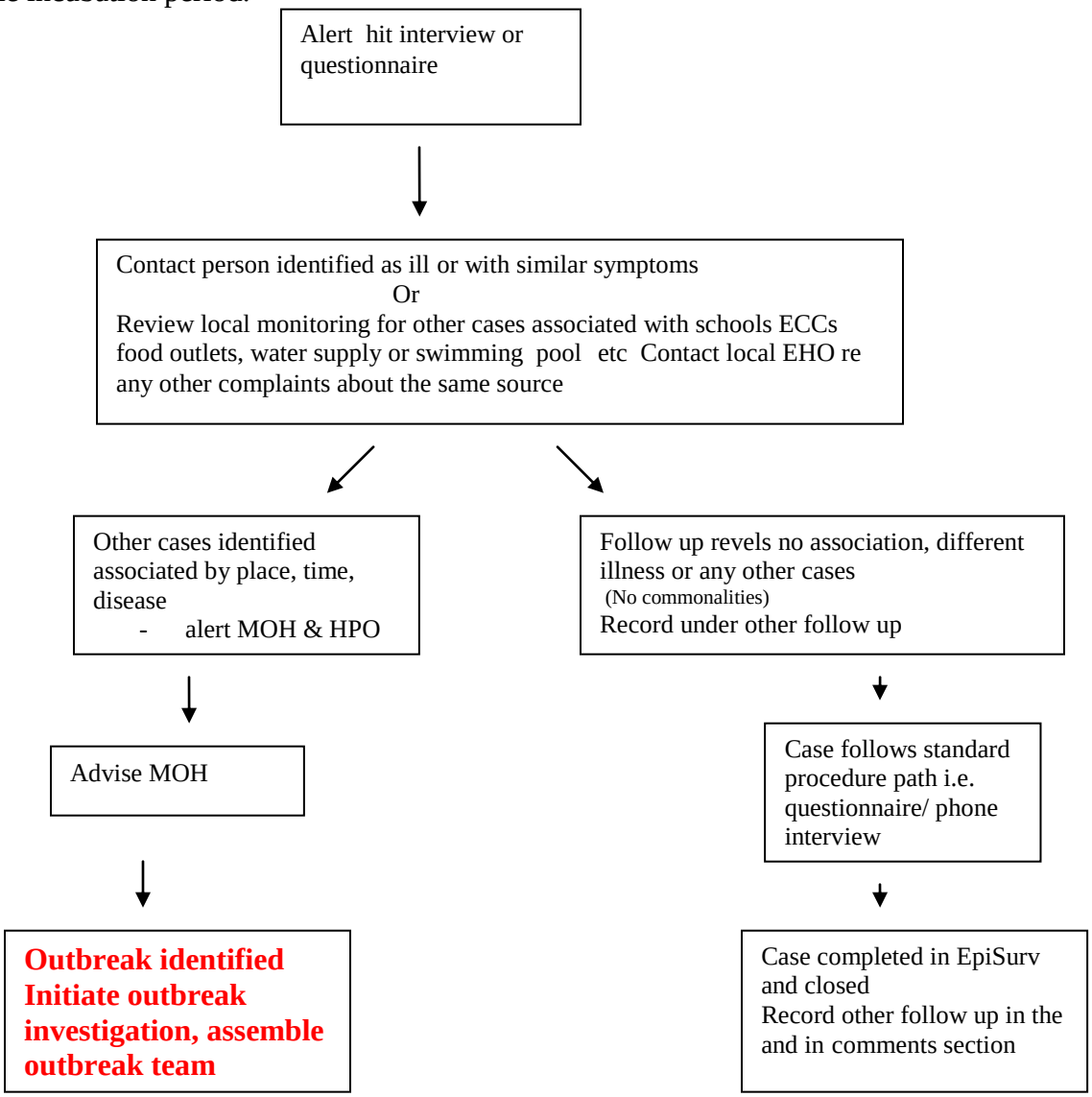
Version 2: 26/05/08

Procedure for identified commonalities from enteric interviews or questionnaires

Definition of an early alert

Aim - An identified commonality should initiate further timely investigation allowing swift Public Health intervention if required.

An alert identified during an interview or from a returned questionnaire. Most alerts are likely to be identified by two questions "contact with another case or symptomatic person" with similar exposures or case eaten "high risk foods at a food premises" during the incubation period.



Version 2: 26/05/08

Procedure for Completing Campy Calls in EpiSurv

Date: 27/5/08 Version: 4

Key points

1. **If you are speaking to case who won't/can't answer put Unknown**
2. **Where possible try to avoid using unknown i.e. contact with another case if they can't name them and are not sure put no and record information under other symptomatic. Attempt to qualify answer i.e. Unsure of consumption of untreated water have they been to any rural sites likely to have untreated water supply and drunk water there?**
3. **Onset date If case is unsure of onset advise them date sample taken to Dr and ask how long they had been sick prior to this date, if they are vague, i.e. "I think about three weeks" calculate from date specimen taken and use "approximate" tick box**

Field	Correct completion
Occupation	State it / unknown
Ethnicity	Tick relevant box/ unknown
Clinical criteria	Ask if they had D's if not what other symptoms yes if they meet criteria or no if not
Meets Lab criteria	yes
Status	Confirmed if symptomatic /not a case if not
Epi Criteria	Confirmed case contact – Yes/No (if they don't know anybody who tested positive put no) Part of an outbreak – if we are not investigating an outbreak and they have said no to above – No (this could change under other symptomatic persons)
Samples Food/water	No
Date of Onset	Date or unknown
Hospitalised	Yes/No
Died	No – if your talking to them
Outbreak details	No tick
Food Premises	Yes/ No/ Unknown -if don't know name of premises – yes and unknown in premise name and region
Drinking water	Home address water code
Consumed untreated water	Yes/No/Unknown
Rec Water contact	Yes/ No/Unknown
Overseas recently	Yes/No
Prior travel	Yes/No
Human contact	Attendance sch, ecc Yes/No Contact with nappies/sewage etc Yes/No/UK Farm animals Yes/No/UK Sick animals Yes/No/UK
Source	Epi evidence – No Lab evidence – No Probable source – list if known
Case Management	Excluded – Yes/No Ecc worker – Yes/No Food worker – Yes/No Water worker – Yes/No

	Intel/physical impaired – Yes/No Health/rest home worker – Yes/No Clearance – Yes/No Number of contacts - state number Number of contacts followed – 0 or number if you do
Extra details	Local Case management "date sent for investigation" = date file put on HPO desk "date investigation received" = date phone interview undertaken Name of care giver

Additional Information for Massey Campylobacter Project

Either complete questions on sticker attached to hard copy or Open Access data base: log lab number from lab notification, log EpiSurv number, date reported, date contacted. **(unable to contact leave blank and record "No contact" in comments)**

Did you consume raw (unpasteurised milk in the incubation)	**Yes/No/ Unknown (drop box or tick box on sticker on hardcopy)**
What meats did you eat in the incubation period Lamb, chicken, pork, beef, deli ham, bacon, venison,	**Yes/No/Unknown/ in each of the meat categories (drop box or tick box on sticker on hardcopy)**

Procedure for Completing Returned Questionnaires in EpiSurv

Date: 27/05/08 Version: 4

Key points - Look for questions answered within the comments
- include comments word for word in ""

Field	Correct completion	Alert
Occupation	Closest option available/unknown	
Ethnicity	Ethnicity listed by case/unknown	
Clinical criteria	Symptoms ticked = yes/no/Unknown	
Meets Lab criteria	yes	
Status	Confirmed - based on assumption a case visiting a Dr, providing a faecal spec is likely to have symptoms which motivated them	
Epi Criteria	Confirmed case contact – UK Part of an outbreak – No (unless it is)	
Samples Food/water	No/ unless further follow up is undertaken	
Date of Onset	Onset listed by case/unknown	
Hospitalised	Unknown	
Died	No	
Outbreak details	Not tick (unless it is)	
Food Premises	Premises listed/No/ unknown -if don't know name of premises – yes and unknown in premise name and region	Further contact if high risk food or other known cases Send email to PHU if premise outside region
Drinking water	Home address water code/ or as listed on back	If tank/bore send info pack
Rec Water contact	As listed/unknown	
Overseas recently	As listed /unknown	
Prior travel	If listed /unknown	
Human contact	Another symptomatic person – yes/no/unknown Contact faecal/vomit unknown (not in questionnaire)	Further contact via telephone
Animal contact	Contact Farm animals – yes/no/unknown Contact sick animals – yes/no/unknown	
Source	Epi evidence – No Lab evidence – No Probable source – list if likely source id /no/unknown	
Case Management	Excluded – Unknown/unless known Ecc worker – Unknown/unless known Food worker – Unknown/unless known Water worker – Unknown/unless known Intel/physical impaired – Unknown (unless Dr/they have advised) Health/resthome worker – Unknown/unless known Clearance – No/unless we request it Number of contacts - 0 Number of contacts followed - 0	
Extra Details	Case management date sent for investigation = date questionnaire sent date investigation received = date questionnaire returned name of person completing questionnaire	

Procedure for Completing Non-returned Questionnaires in EpiSurv

Date: 27/05/08 **Version: 4**

Key points - No presumptions

Field	Correct completion
Occupation	Complete if advised by Dr
Ethnicity	Leave incomplete if unknown
Clinical criteria	Unknown (unless Dr advises symptoms)
Meets Lab criteria	yes
Status - based on assumption a case visiting a Dr, providing a faecal spec is likely to have symptoms which motivated them	Confirmed
Epi Criteria	Confirmed case contact – UK Part of an outbreak – No (unless it is)
Samples Food/water	No
Date of Onset	Unknown
Hospitalised	Unknown
Died	No
Outbreak details	Not tick
Food Premises	Unknown
Drinking water	Home address water code
Rec Water contact	Unknown
Overseas recently	Unknown
Prior travel	Unknown
Human contact	Another symptomatic person – Unknown Contact faecal/vomit - Unknown
Animal contact	Contact Farm animals – Unknown Contact sick animals - Unknown
Source	Epi evidence – No Lab evidence – No Probable source - Unknown
Case Management	Excluded – Unknown Ecc worker – Unknown Food worker – Unknown Water worker – Unknown Intel/physical impaired – Unknown (unless Dr has advised) Health/resthome worker – Unknown Clearance – No Number of contacts - 0 Number of contacts followed - 0
Extra details	Do not include dates

10.3 Draft 2 Page Telephone Screening Form to be Trialled by MCPHS

Episurv No:_____ Disease:_____

Case:_____ Age:_____

Parent/guardian:_____

Address:_____

Phone No (1): (____)_____ Phone No (2): (____)_____O

To do:	Send N/C letter ☐	Send Ed info ☐	Send H2O info ☐

Person (initial)	1st Episurv Entry (date entered)	N/C Letter sent (date sent)	Contacted Case (date phoned)	Info sent (date sent)	Local database (onset week)	Campy Database (Phone ID #)

Attempts to contact: (3X then send letter)

Initial	Date/time	Initial	Date/time	Initial	Date/time

Probable source(s):

If not, were any probable sources identified?*

Specify probable source(s)* ○ Yes ○ No ○ Unknown

- ☐ From consumption of contaminated food or drink, specify food or drink _____
- ☐ From consumption of contaminated drinking water, specify supply _____
- ☐ From contact with infected animal, specify type of animal _____
- ☐ Person to person contact with another case, specify relationship to case _____
- ☐ From other probable source, specify source _____

Additional completed actions: i.e. email to TLA/another PHS, water sampling

_____

_____

	Initial	Date
HPO/TO sign off		
Details entered on Episurv (incl. extra details)		
Closed off on Episurv		
MoH sign off		

Telephone Screening Form for Episurv No:_____

Occupation:_____

Name of workplace/school/ECC:_____

Address of workplace/school/ECC:_____

Ethnicity: NZ Euro Maori Samoan Chinese Indian Other:_____

Symptoms: Dia Abdo Nausea Headache Fever Fatigue Vomiting Weight-loss Bloating Flatulence Muscle-pain
Other:_____ Meets clinical description? (use table) Y N

Were you hospitalised? Y N **Date:** / / **Hospital:** _____ **A&E ☐ Wards ☐**

Did you/ your child have contact with somebody with the same illness? *(lab confirmed):* YES NO

Did you/ your child have contact with somebody with a similar illness? *(same symptoms):* YES NO
(Answers confirmed case & other symptomatic fields)
Name and association with person/place: _____

What date did you/your child first become sick/have symptoms _____ **☐ Approx**
(prompt: advise date specimen taken to Dr how long – number of days before this time you became ill & calculate on calendar)

Did you/your child eat in or from any food outlets in the ____ days before illness YES NO
(based on incubation of disease counting back from onset date above)

Name of premise	Address	Foods eaten	Date	TLA/local PHS advised date

CAMPY ONLY - Have you/your child consumed any of the following in 7 days prior to illness (tick if yes)
Unpasteurised/raw milk ☐ Lamb ☐ Beef ☐ Chicken ☐ Deli meats ☐
Pork ☐ wild meats ☐ Home kill ☐

Source of water supply at; Home:_____**Work/school:**_____**Other:**_____

Did you/your child consume water from an untreated water supply? e.g. roof, bore, spring **YES NO**

Specify where:_____

Have you/your child had recreational water contact? E.g. pools, fishing, boating **YES NO**

Activity	Where	Date

Have you/your child had any contact with Farm animals? YES NO Specify _____

Have you/your child had any contact with sick animals? YES NO Specify _____

Did you/your child have contact with faecal matter? YES NO Specify _____
Animal ☐ e.g. poop scoop **Human ☐** e.g. nappies, broken sewerage systems

Have you/your child been overseas in the incubation period? YES NO Date returned to NZ: / /
Countries visited: _____
Did you/your child stay at home while symptomatic*? YES NO N/A
for those in high risk jobs e.g. food prep, ECC, health care or children in ECC's etc
Number of contacts identified: E.g. household, work colleagues, school friends etc_____

Any thing you think has caused your/your child's illness i.e. contact with faecal matter (if not already discussed)

10.4 EpiSurv Enteric Disease Case Report Form

CASE REPORT FORM **Enteric Disease**

Enteric Disease EpiSurv No. _____

Disease Name

○ Gastroenteritis - unknown cause ○ Gastroenteritis/foodborne intoxication - specify _____

○ Campylobacteriosis ○ Cholera ○ Cryptosporidiosis ○ Giardiasis

○ Paratyphoid fever ○ Salmonellosis ○ Shigellosis ○ Typhoid fever ○ Yersiniosis

Reporting Authority

Name of Public Health Officer responsible for case _____

Notifier Identification

Reporting source* ○ General Practitioner ○ Hospital-based Practitioner ○ Laboratory ○ Self-notification ○ Outbreak Investigation ○ Other

Name of reporting source _____ **Organisation** _____

Date reported* _____ **Contact phone** _____

Usual GP _____ **Practice** _____ **GP phone** _____

GP/Practice address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode ____

Case Identification

Name of case* Surname _____ Given Name(s) _____

NHI number* _____ **Email** _____

Current address* Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode ____

Phone (home) _____ **Phone (work)** _____ **Phone (other)** _____

Case Demography

Location **TA*** _____ **DHB*** _____

Date of birth* _____ **OR** **Age** _____ ○ Days ○ Months ○ Years

Sex* ○ Male ○ Female ○ Indeterminate ○ Unknown

Occupation* _____

Occupation location ○ Place of Work ○ School ○ Pre-school

Name _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode ____

Alternative location ○ Place of Work ○ School ○ Pre-school

Name _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode ____

Ethnic group case belongs to* (tick all that apply)

☐ NZ European ☐ Maori ☐ Samoan ☐ Cook Island Maori

☐ Niuean ☐ Chinese ☐ Indian ☐ Tongan

☐ Other (such as Dutch, Japanese, Tokelauan) *(specify) _____

Enteric Disease EpiSurv No._____

Basis of Diagnosis

CLINICAL CRITERIA

Fits clinical description* ○ Yes ○ No ○ Unknown

LABORATORY CRITERIA (refer to case definition)

Meets laboratory criteria* ○ Yes ○ No ○ Unknown

Organism / toxin / antigen / oocysts / cysts / trophozoites isolated or detected from body site* ○ Yes ○ No ○ Not Done ○ Awaiting Results

Specify site* ○ Faeces ○ Blood ○ Other site (*specify) _____

Organism / toxin isolated or detected from linked food or water* ○ Yes ○ No ○ Not Done ○ Awaiting Results

EPIDEMIOLOGICAL CRITERIA

Contact with a confirmed case of the same disease* ○ Yes ○ No ○ Unknown
(If yes also record details in risk factors section)

Part of an identified common source outbreak* ○ Yes ○ No ○ Unknown
(If yes also record details in outbreak section and risk factors section)

STATUS* ○ Under Investigation ○ Probable ○ Confirmed ○ Not a case

ADDITIONAL LABORATORY DETAILS

Organism species/serotype/phage toxin etc* _____

ESR Updated ☐ Laboratory _____

Date result updated _____ Sample Number _____

ASSOCIATED FOOD/WATER/ENVIRONMENTAL SAMPLES

Were there any food, water or environmental samples associated with this case? ○ Yes ○ No ○ Unknown

If yes, specify type(s) and results

Sample Type	Sample Number	Result

Clinical Course and Outcome

Date of onset* _____ ☐ Approximate ☐ Unknown

Hospitalised* ○ Yes ○ No ○ Unknown

Date hospitalised* _____ ☐ Unknown

Hospital* _____

Died* ○ Yes ○ No ○ Unknown

Date died* _____ ☐ Unknown

Was this disease the primary cause of death?* ○ Yes ○ No ○ Unknown

***If no, specify the primary cause of death**

_____

Outbreak Details

Is this case part of an outbreak (i.e. known to be linked to one or more other cases of the same disease)?*

☐ Yes **If yes, specify Outbreak No.*** _____

Enteric Disease EpiSurv No. _____

Risk Factors

FOOD PREMISES

Did the case consume food from a food premises during the incubation period?~ ○ Yes ○ No ○ Unknown

If yes, specify

1. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

2. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

3. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

DRINKING WATER

Current address* water supply code _____ or specify _____

Work/school/pre-school* water supply code _____ or specify _____

Did the case consume water other than regular supply (home or work / school / pre-school) during the incubation period?~ ○ Yes ○ No ○ Unknown

If yes, specify address* _____ _____ _____ Water supply code _____

_____ _____ _____ Water supply code _____

Did the case consume untreated surface water, bore water or rain water during the incubation period?~ ○ Yes ○ **No** ○ **Unknown**

If yes, specify water source:~ _____

RECREATIONAL WATER CONTACT

Did the case have recreational contact with water during the incubation period?~ ○ Yes ○ No ○ Unknown

If yes, nature of contact

☐ **Swimming in public swimming pool, spa pool or in other pool (e.g. school, hospital, motel, private pool)**

1. Name of pool _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Comments _____ Date of exposure _____

2. Name of pool _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Comments _____ Date of exposure _____

Enteric Disease EpiSurv No.

3. Name of pool

Address Number Street Suburb

Town/City Post Code ☐ GeoCode

Comments Date of exposure

☐ **Swimming in streams, rivers, sea etc**

1. Name of stream/river/beach

Address Number Street Suburb

Town/City Post Code ☐ GeoCode

Comments Date of exposure

2. Name of stream/river/beach

Address Number Street Suburb

Town/City Post Code ☐ GeoCode

Comments Date of exposure

3. Name of stream/river/beach

Address Number Street Suburb

Town/City Post Code ☐ GeoCode

Comments Date of exposure

☐ Other recreational contact with water specify Date of exposure

Location of other recreational contact with water

HUMAN CONTACT

Attendance at school, preschool or childcare~ ○ Yes ○ No ○ Unknown

Did the case have contact with other symptomatic people during the incubation period?~ ○ Yes ○ No ○ Unknown

If yes, specify type of contact

If yes, give names of people

Did the case have contact with children in nappies, sewage or other types of faecal matter or vomit during the incubation period?~ ○ Yes ○ No ○ Unknown

If yes, specify what they had contact with

ANIMAL CONTACT

Did the case have contact with farm animals during the incubation period?~ ○ Yes ○ No ○ Unknown

If yes, specify type of animal

Did the case have contact with sick animals during the incubation period?~ ○ Yes ○ No ○ Unknown

If yes, specify type of animal and illness

OVERSEAS TRAVEL

Was the case overseas during the incubation period for this disease* ○ Yes ○ No ○ Unknown

If yes, date arrived in New Zealand*

Specify countries visited*	Country	Date Entered	Date Departed
Last (most recent):*			
Second last:*			
Third last:*			

Enteric Disease EpiSurv No.

Risk Factors continued

If the case has not been overseas recently, is there any prior history of overseas travel that might account for this infection?* ○ Yes ○ No ○ Unknown

If yes, specify*

OTHER

Other risk factor for disease (specify)~

Source

Was a source confirmed by*

a) Epidemiological evidence* ○ Yes ○ No ○ Unknown

e.g. part of an identified common source outbreak (also record in outbreak section) or person to person contact with a known case

b) Laboratory evidence* ○ Yes ○ No ○ Unknown

e.g. organism or toxin of same type identified in food or drink consumed by case

Specify confirmed source(s)*

☐ From consumption of contaminated food or drink, specify food or drink

☐ From consumption of contaminated drinking water, specify supply

☐ From contact with infected animal, specify type of animal

☐ Person to person contact with another case, specify relationship to case

☐ From other confirmed source, specify source

If not, were any probable sources identified?*

Specify probable source(s)* ○ Yes ○ No ○ Unknown

☐ From consumption of contaminated food or drink, specify food or drink

☐ From consumption of contaminated drinking water, specify supply

☐ From contact with infected animal, specify type of animal

☐ Person to person contact with another case, specify relationship to case

☐ From other probable source, specify source

Management

CASE MANAGEMENT

Case excluded from work or school/preschool/childcare until well? ○ Yes ○ No ○ NA ○ Unknown

Does the case fit any of the following high risk categories?

Early childhood centre work ○ Yes ○ No ○ Unknown

Food handler ○ Yes ○ No ○ Unknown

Water supply worker ○ Yes ○ No ○ Unknown

Intellectually/physically impaired ○ Yes ○ No ○ Unknown

Healthcare/rest-home worker ○ Yes ○ No ○ Unknown

If yes, to any of the above, was the case excluded from work until microbiological clearance achieved? ○ Yes ○ No ○ NA ○ Unknown

CONTACT MANAGEMENT

Number of contacts identified

Number of contacts followed up according to national or local protocols

Enteric Disease EpiSurv No. _____

Comments*

Food Premises

4. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

5. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

6. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

7. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

8. Name of premises _____

Address Number _____ Street _____ Suburb _____

Town/City _____ Post Code _____ ☐ GeoCode____

Foods eaten _____ **Date consumed** _____

Comments _____ **Status** ○ Suspected ○ Confirmed ○ Exonerated

Version 3rd August 2007 *** core surveillance data, ~ optional data**