

**COMMUNITY & PUBLIC HEALTH REPORT TO THE DARFIELD COMMUNITY
AN OUTBREAK OF WATERBORNE GASTROENTERITIS IN DARFIELD, CANTERBURY, JULY-
AUGUST 2012**

What occurred prior to the outbreak?

Following a pump failure on 18 June 2012, the drinking-water source in Darfield changed from a deep well, using groundwater, to the previous source, the Waimakariri River. In mid-August heavy rainfall resulted in surface flooding and increased turbidity (cloudiness) of the water supply. The usual weekly microbial testing revealed *coliforms* and *E.coli* in the water supply on 16 August. *Coliforms* and *E.coli* are microbes that are used as indicators of water contamination. At this time it was also discovered that no chlorination was occurring and therefore chlorine was manually added to the reservoir. The Selwyn District Council (SDC) informed Community & Public Health (C&PH) and issued a boil water notice on the 17th August.

What did Community and Public Health do?

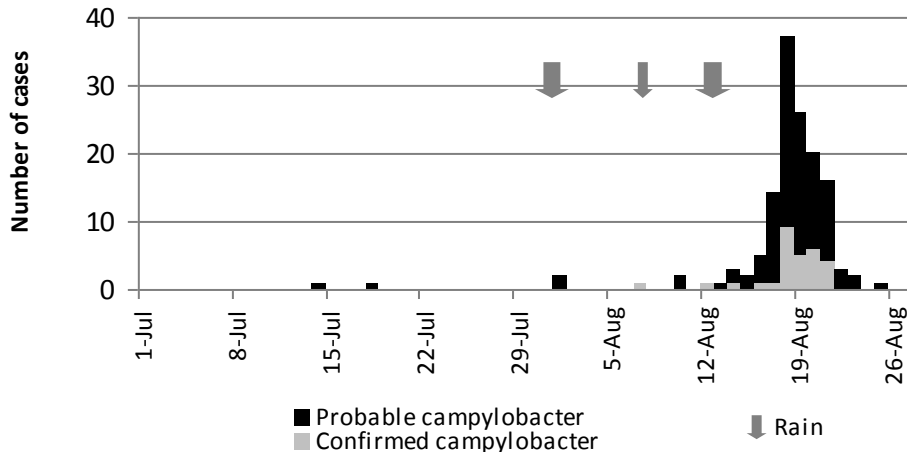
Darfield Medical Centre notified C&PH of 13 cases of gastroenteritis on 22 August. As a result C&PH started an outbreak investigation. People who had been ill completed questionnaires via telephone or in writing. Questionnaires were distributed at a public meeting, through the Council offices, at the Darfield Medical Centre and were accessible on a local community website. People who still had symptoms were requested to provide stool samples for testing for gastroenteritis infections. A site visit to the water supply was carried out and information about rainfall levels was requested from Environment Canterbury.

What did our investigation find?

Twenty-nine people had stool samples positive for *Campylobacter*, a bacterial cause of gastroenteritis. In addition a further 109 people met the definition for probable campylobacteriosis and 8 individuals had a milder gastroenteritis. The majority of people developed symptoms between 15-25 August following the 164mm rainfall between late July and mid August. Given that the incubation time (time for symptoms to develop) for campylobacteriosis is 1-10 days, although *E. coli* and *coliforms* were first found on water testing on 16 August, the major contamination event probably occurred earlier, around the 13 and 14 August.

Most of the people affected (94%) lived in Darfield, with all cases having drunk unboiled water from the Darfield water supply. The cases had no other risk exposures (such as food consumption, recreational water contact, human contact or animal contact) in common.

Darfield waterborne outbreak July-August 2012: Onset dates of probable and laboratory confirmed campylobacteriosis cases



The way the water supply became contaminated is likely to have been due to the heavy rainfall causing either:

1. Runoff of animal effluent from paddocks upstream from the well flowing into the Waimakariri River and from there into the infiltration gallery (the area through which the river water is drawn into the supply). The intake from the river was unlikely to have provided significant levels of filtration given the typically high permeability of gravels in the area, or
2. Effluent may have contaminated the gallery directly by seepage through the ground. The well in use at the time of the outbreak sat in a small dip in an unsecure privately owned paddock, where sheep are known to graze. It is uncertain whether the paddock was flooded during the recent rains or not.

The failure to implement a strategy to manage turbidity, lack of chlorine treatment and the lack of protozoal barriers led to water containing disease-causing organisms to be distributed through the town's water supply and the subsequent outbreak of gastroenteritis.

What is being done now?

By 22 August the deep bore pump had been reinstalled and the water has been repeatedly tested and found to be free of microorganisms since then. The SDC are currently looking for an alternative groundwater source that will be capable of meeting the water requirements of Darfield, without requiring supplementation from the Waimakariri River. C&PH staff are working with SDC to reduce the likelihood of further waterborne outbreak occurring. C&PH will continue to encourage and support SDC to adopt a multi-barrier approach to their drinking water supplies involving protection, monitoring and maintenance of the source, treatment and distribution, consistent with New Zealand drinking water legislation.