

# Influenza H1N1 2009 in Canterbury: a case study in pandemic response co-ordination

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## ABSTRACT

**BACKGROUND AND CONTEXT:** Reviews of overseas pandemic responses have suggested that stronger links between primary care and other parts of the health sector are required. The influenza A (H1N1) 2009 ('H1N1 09') pandemic was the first real test of New Zealand's pandemic preparedness.

**ASSESSMENT OF PROBLEM:** In the six months from May to October 2009, there were 595 confirmed cases of H1N1 09 in Canterbury, with 187 hospitalisations and three deaths. This paper describes the way a range of Canterbury agencies worked together in a co-ordinated health-led response aimed at minimising the impact of H1N1 09 in the community and maintaining effective health care services for both influenza and non-influenza patients.

**STRATEGIES FOR IMPROVEMENT:** Key strategies included sector-wide response co-ordination, intelligence and communications, a combined public health/primary care response during the 'containment' phase, and universal red/green streaming supported by dedicated 'flu centres and an 0800 call centre during the 'manage it' phase.

**LESSONS:** Despite the considerable impact of the H1N1 09 virus in Canterbury, health care services were not overwhelmed. The key lesson learned from the Canterbury H1N1 09 response has been the importance of preparing and working together across the sector.

**KEYWORDS:** Influenza, human; pandemic; primary health care; public health; mass media; civil defence

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## Background

There are important overlaps between the essential functions of primary care and public health.<sup>1</sup> Prior to 2009, Canadian and Australian reviews suggested that stronger links between primary care and other parts of the health sector, particularly public health, were required.<sup>2,3</sup>

Canterbury is New Zealand's second largest geographic region, with the second biggest population (522 000 at the 2006 census). Canterbury agencies had a history of working together on pandemic preparedness prior to 2009, including responding to SARS (2003), avian influenza (2004), and two major national

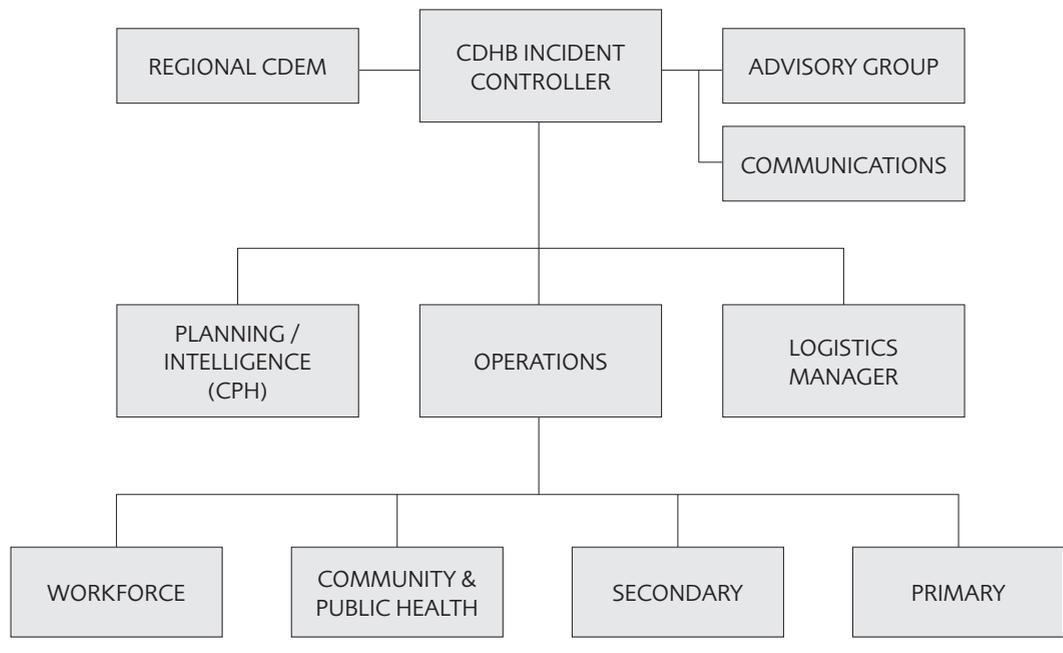
pandemic exercises in 2006 and 2007. An intersectoral pandemic planning group including key sector leaders continued to meet monthly following the 2007 exercise. All agencies were familiar with the National Pandemic Action Plan<sup>4</sup> (see Text Box 1) and the Co-ordinated Incident Management System (CIMS)<sup>5</sup> and had their own response plans in place (see Text Box 2).

## Assessment of problem

Canterbury's H1N1 09 response was initiated on 25 April. The 'keep it out' and 'stamp it out' phases of the response lasted until 19 June, when

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Figure 1. Canterbury Pandemic CIMS structure



it was clear that H1N1 09 was spreading extensively in Canterbury and a shift to ‘manage it’ was announced, coinciding with the opening of the central city ‘Flu Centre.’<sup>6</sup>

From May to October 2009 there were 595 confirmed cases of pandemic influenza A (H1N1 09) in Canterbury, with 187 hospitalisations and three deaths. Confirmed cases were only a

small minority of community cases. A random telephone survey of 600 households in August estimated that 25% of Canterbury residents had developed an influenza-like illness in the preceding 10 weeks, a finding consistent with a subsequent national serosurvey.<sup>7</sup>

The aim of this paper is to describe the strategies developed by range of Canterbury agencies to work together in a co-ordinated health-led response with the goal of minimising the impact of H1N1 09 in the community and maintaining effective health care services for both influenza and non-influenza patients.

**Strategies**

**Response co-ordination**

From 25 April, Canterbury District Health Board’s (CDHB’s) Chief Medical Officer assumed overall leadership of the response and established a CIMS structure that included all major operations groups (see Figure 1). The response group met daily throughout the response. Significant CDHB funding (up to \$2.8 million) was approved to support proactive management by the sector.

*Text Box 1. Stages of the New Zealand influenza pandemic action plan 2006*

1. Plan for it
2. Keep it out (border management)
3. Stamp it out (cluster control)
4. Manage it
5. Recover from it

*Text Box 2. Aims of the Canterbury response*

1. Minimise transmission—‘flatten the curve’
2. Minimise infection rate in primary health care workers
3. Maintain safe, quality care within general practice and the rest of the health system for non-‘flu patients
4. Provide safe and accessible care for patients with ‘flu

The Primary Care Coordination Room (PCCR), led by general practitioners and based at Pegasus Health—Christchurch’s largest Independent Practitioner Organisation (IPA)—co-ordinated pandemic activity for primary care throughout Canterbury.

**Sector intelligence**

Throughout the response CDHB’s public health division, Community and Public Health (CPH), provided a regular web-based intelligence report to the DHB responses in Canterbury, South Canterbury and the West Coast. The report included input from all local response agencies, as well as national and international information. Access was available to all involved in the response, including links from general practitioner intranets.

**Communications**

Consistent community messages about infection control, isolation, and when and where to seek medical advice were critical to managing patient numbers. Canterbury’s pandemic communications were co-ordinated by the CDHB Communications team. Key spokespeople included the Chief Medical Officer, Medical Officers of Health and Primary Care leaders. Prior involvement of local media in pandemic planning meant that most had a good understanding of the rationale for Canterbury’s H1N1 09 response, and media coverage was largely supportive.

CDHB’s influenza website [www.fluinfo.org.nz](http://www.fluinfo.org.nz) was upgraded, and between 28 April and 31 August there were 21 185 site visits and 87 074 page views. Email updates, media releases and other background information were disseminated to a wide range of community organisations. A public awareness campaign promoted a series of simple, brightly illustrated messages (see Text Box 3) via a variety of media, including bus shelter advertising, posters, newspaper advertising, and other print media.

From 19 June to 21 August Canterbury people were advised not to go to their general practitioner if they had ‘flu-like symptoms but to call an 0800 line which offered recorded information and the option to speak to an operator for advice or a ‘Flu Centre appointment. Over two months the

**WHAT GAP THIS FILLS**

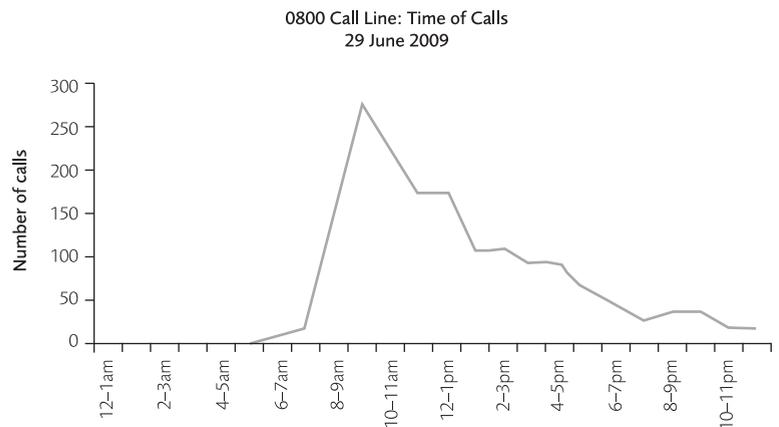
**What we already know:** Influenza pandemics occur on average three times each century and cause significant morbidity and mortality. Reviews of overseas pandemic response structures have suggested that stronger links between primary care and other parts of the health sector are required. The initial wave of the H1N1 09 pandemic was the first real test of New Zealand’s pandemic preparedness.

**What this study adds:** Canterbury’s H1N1 09 response showed that significant reconfiguration of health care services, including universal red/green streaming, can be achieved if there is effective sector-wide planning and co-ordination.

*Text Box 3. Community messages*

- Stop the ‘flu (accompanied all other messages)
- Sick? Stay home
- Cover coughs and sneezes
- Wash hands
- If you are worried about your ‘flu symptoms call 0800 37 30 37
- For more information visit [www.fluinfo.org.nz](http://www.fluinfo.org.nz)

*Figure 2. Calls to 0800 line*



line received 33 080 calls, with a daily maximum of 2183 calls and a daily late-morning peak (see Figure 2). The call centre was managed by CDHB and staffed by a mix of contracted call centre staff, CDHB staff, and primary care nurses.

**Logistics support**

Once the response was under way sector-wide procurement became a logical extension of the

CDHB logistics role. CDHB also co-ordinated some sector-wide workforce requirements, including provision of clinical staff for the 0800 line.

### Border and cluster control

During the containment phase, CDHB's CPH undertook border and cluster control. Public health nurses met all international flights arriving in Christchurch from 28 April to 3 July. While few passengers presented at the airport, subsequent presentation of recent travellers to general practice was more common, and a combined public health / primary care screening clinic was established to assess patients who met the suspect case definition either at the border or in the community.

During this phase, public health staff also arranged isolation of patients meeting the case definition. This included an arrangement with a Christchurch hotel to accommodate travellers not able to be quarantined at home. Once a case was confirmed, their in-flight and domestic contacts were traced, asked to remain in home quarantine, and provided with prophylactic Oseltamivir (Tamiflu®). By 19 June, Oseltamivir had been provided to over 780 cases and contacts in Canterbury.

### Aranui Clinic

The initial large cluster of cases in Christchurch's Samoan community stretched resources. In

response to this, Christchurch's first 'Flu Centre was set up in Aranui, at the heart of the affected community. The centre saw 141 patients over three days, and was primary care-led with strong support from CPH and local Samoan community leaders. The clinic bridged the 'stamp it out' and 'manage it' phases, and for the first time in the response, patient and contact management was based largely on clinical diagnosis, rather than relying on laboratory confirmation.

### Central city 'Flu Centre

The formal move to 'manage it' on 19 June was marked by the initiation of the 0800 line and the opening of the central city 'Flu Centre. As the pandemic progressed, the severity of illness in patients seen at the 'Flu Centre also increased, requiring additional staff resources and equipment. Staffing was initially a mix of primary and secondary care doctors, nurses and administration staff, but clinical staffing drew more heavily from primary care as the pandemic progressed. The dedicated information system was populated with demographic data from the primary care database. Patient volume and patient characteristics at the 'Flu Centre were reported daily in the CDHB intelligence report, and were an important indicator of the progression of the pandemic and of overall demand for services. The centre worked closely with the Emergency Department, 24 Hour Surgery and other after-hours clinics and saw 5092 individual patients with a total of 6227 visits between 19 June and 18 August (see Figure 3).

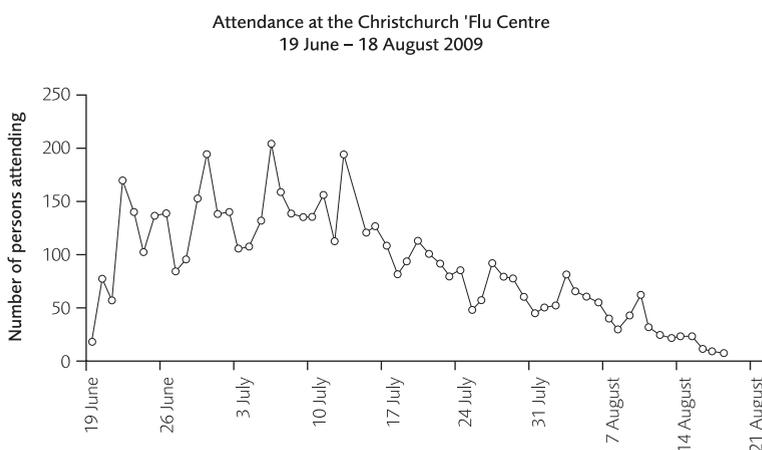
### Rural 'flu centres

Eight other 'flu centres were opened in rural areas as demand required. These generally were small community cooperative ventures with local authority support operating in close association with the local general practices. Between 22 June and 11 August they saw 706 patients. Logistic support, communications, and sometimes appointment bookings for these rural centres occurred through the PCCR and 0800 line.

### Institutionalised and high risk patients

Immobile institutionalised patients and patients with risk factors qualifying them for Osel-

Figure 3. 'Flu Centre attendance



tamivir but not sufficiently ill to visit the 'Flu Centre were recognised as special groups. Systems were set up so the patient's usual GP could either visit using appropriate personal protective equipment, or use a comprehensive telephone assessment and then arrange an Oseltamivir prescription.

### CDHB secondary care

Pandemic plans had anticipated an overloading of hospital services. Red and green streams were established for admission through the Emergency Department and dedicated 'flu wards were established. A staff 'flu clinic was established and provided advice, post-exposure prophylaxis and prompt treatment of unwell staff. High risk patients attending hospital outpatient departments were identified and offered prophylaxis.

for secondary care patients, with a corresponding restriction in use of testing in the community.

### Civil Defence Emergency Management / Welfare

Regional communication and coordination of local authority Civil Defence and Emergency Management (CDEM) functions were provided by the Regional Emergency Management Office (EMO), consistent with the National Pandemic Action Plan<sup>4</sup> and MCDEM Pandemic Planning Guide.<sup>8</sup> A website was established for registration of volunteers and arrangements were made for volunteer efforts to be co-ordinated by local authorities with primary care input.

The Regional EMO's Emergency Management Survey provided information on the community's

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These measures, the relatively mild nature of most cases of H1N1 09 and the diversion of patients with influenza-like illness (ILI) to the 'Flu Centre meant that most hospital services, including the Emergency Department, continued to operate relatively normally. The notable exception was the Intensive Care Unit, which operated over capacity for a significant period.

### Laboratories

Laboratory services guided clinical and public health management of cases and contacts and informed surveillance. CDHB's Canterbury Health Laboratories provided both a local and a regional service. Laboratory staff were closely involved in the development and ongoing review of clinical testing guidelines, which were a key tool in management of demand for laboratory services. During the 'manage it' phase there was an increasing focus on use of laboratory services

experience of both influenza-like illness and interruption of access to resources. A second survey was conducted by CPH, and rolling surveys would have continued if required.

### Lessons and messages

Despite the considerable impact of the H1N1 09 virus in Canterbury, health care services were not overwhelmed. The Canterbury H1N1 09 response was based on extensive planning and strong relationships formed well before the pandemic. In particular, monthly intersectoral pandemic planning meetings had maintained engagement across the sector, which in turn laid the foundations for rapid response activation and adaptation of existing plans in response to the particular characteristics of the H1N1 09 pandemic.

The CIMS was adopted by both the CDHB co-ordination team and a number of participat-

ing organisations, and was adapted to suit each organisation's needs. It provided an effective framework for leadership, decision-making, communication and allocation of workforce and other resources, and a clear sense for all involved that this response was not 'business as usual'.

In contrast to some other jurisdictions, where national or state response structures had difficulty adapting to challenges such as rapid spread of infection or the generally less severe than expected nature of H1N1 illness,<sup>2,3,9-11</sup> the Canterbury response was actively managed at a regional level, and the daily meetings of all response leaders allowed timely review and consultation, including involvement of front-line general practitioners.

The prompt establishment of the Aranui Clinic (within 48 hours of inception) and rapid con-

Pandemic planning in primary care is both a risk management and a public health matter which requires partnership between general practice and public health.<sup>12</sup> The 'keep it out' and 'stamp it out' responses, which lasted over six weeks, provided valuable time to prepare other components of the response, with early cases effectively isolated and contacts treated and quarantined. Laboratory identification of cases and timely provision of results were vital, with negative results as important as positive results for the public health response. Existing arrangements with border agencies and the hotel industry allowed systems to be established with minimal delay. By the time a cluster of cases was identified in the Christchurch Samoan community, centred on a recent traveller who had not sought medical attention for ILI, containment was no longer possible. The Aranui Clinic was a prompt response to the needs of this community as the overall

### The prompt establishment of the Aranui Clinic (within 48 hours of inception) and rapid conversion of an empty inner-city warehouse into Christchurch's first 'Flu Centre were striking examples of what could be achieved when agencies worked effectively together

version of an empty inner-city warehouse into Christchurch's first 'Flu Centre were striking examples of what could be achieved when agencies worked effectively together.

The attitudes of lead general practitioners have an important effect on pandemic responses effectiveness.<sup>3</sup> Canterbury had robust existing primary care organisations and leadership, and the Primary Care Co-ordination Room was a central component of the response. It was supported by CDHB, but led by general practitioners. Sited at the IPA, based on peer leadership and building on existing relationships, it was able to mobilise and reconfigure primary care in an unprecedented way, including persuading general practitioners of the value of reorganising practice routines so they could contribute to the staffing of the red stream function at the 'Flu Centre.

system transitioned to 'manage it', and again was made possible by existing relationships—in this case between local Samoan community leaders and primary care organisations.

Reconfiguration of health care services would not have been effective without significant changes in the way patients approached the system. Effective co-ordination of community communications was essential for public understanding of how to manage mild illness without medical attention, and how to access services by telephone if required. While this occurred at national level in other countries,<sup>13</sup> Canterbury's regional response structure allowed communications to be matched to the situation as it evolved locally, with review of all communications by CDHB, CPH and primary care. Overall low rates of workplace absenteeism and of primary care consultations

for other illnesses during the pandemic suggest that community infection control messages contributed to reduced rates of not just influenza, but also other winter illnesses, and the CDEM survey demonstrated a high level of awareness among Canterbury people of what to do if they or someone in their family developed ILI.

A well co-ordinated response also requires well-informed staff. The web-based format of the CDHB intelligence report provided ready access to key information about the pandemic and the national and local response for all involved and was the starting point for most planning meetings and for regular fax and email updates to primary and secondary care. It was complemented by the primary care pandemic website, providing detailed local advice to all primary care providers.

Although there was little demand for co-ordinated welfare services during this pandemic wave, a more severe event would require much greater involvement of the welfare sector, including local authorities, and while current plans do include welfare, considerably more planning and resourcing could be required.

The most important message from the Canterbury H1N1 09 response has been the importance of preparing and working together across the sector. The response has further strengthened existing relationships, and has enhanced Canterbury's capacity to provide a co-ordinated response not only to future pandemics, but also to other health system challenges.

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#### ACKNOWLEDGEMENTS

We thank Peter Mitchell and Chris Ambrose, who provided data on service utilisation, Nigel Millar, who led the Canterbury pandemic response, and the many dedicated staff who contributed to the response throughout Canterbury.

#### FUNDING

No specific funding was received for this paper.

#### COMPETING INTERESTS

None declared.