Canturbury Earthquakes: The Public Health Response
Dr. Ramon Pink, Canterbury District Health Board, Christchurch, New Zealand
A Webber Training Teleclass

Session Objectives
1. Overview of the Christchurch earthquakes
2. To understand potential sites of infection
3. Practical aspects of Infection control and communicable disease surveillance
4. Understanding some of the issues around recovery

Session Outline
- September 4th & the lessons learned
- February 22nd & June 13th
- Public Health Issues & Response
- Infection Control & Gastro surveillance
- Recovery

Aotearoa, New Zealand
- South Pacific nation
- Population 4,409,224
- Area 270,534 km²

September 4th 2010, 0435 - The Darfield Earthquake
- Magnitude 7.1
- No deaths
- Power and water off for a few days for most people
- Sewerage extensively damaged
- More than 7500 aftershocks since this initial event
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Earthquakes
- 1931 Hawkes Bay 7.8
- 1968 Inangahua 7.1
- 1987 Edgecumbe 6.5
- 1994 Northridge (USA) 6.7
- 1995 Kobe (Japan) 6.8
- 2007 Gisborne 6.8
- 2009 Dusky Sound 7.8
- 2010 Port au Prince (Haiti) 7.0
- 2010 Darfield 7.1

Earthquakes
- 1931 Hawkes Bay 7.8 256 deaths
- 1968 Inangahua 7.1 2 deaths
- 1987 Edgecumbe 6.5 72 deaths
- 1994 Northridge (USA) 6.7 6434 deaths
- 1995 Kobe (Japan) 6.8 230,000 deaths
- 2007 Gisborne 6.8 0 deaths
- 2009 Dusky Sound 7.8
- 2010 Port au Prince (Haiti) 7.0
- 2010 Darfield 7.1

Why the low mortality?
- Rigorous building codes adhered to
- Time of day (0435)
- Epicentre away from city

Liquefaction!

Masonry buildings

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Public health issues
- Sewage disposal/exposure to sewage
- Contamination of water supplies
- Food safety
- Disease outbreaks
- Warmth, shelter
- Welfare centres
- Chemical spills
- Social disruption, anxiety

Recovery issues
- Sewage contamination
- Community recovery
- Restoring buildings and infrastructure
- Opportunities
- Not leaving people behind

What did we learn?
- A well informed community can do a lot for themselves
- The community appreciates face to face contact
- Portaloo's are important
- Health extends across all aspects of recovery

“If you want to fix my mental health, I don’t need a counsellor, I need a drainlayer!”

22nd February 2011 12.51pm
- 6.3 magnitude earthquake
- Modified Mercalli up to 10 (2.24G Peak ground acceleration)
- 181 Confirmed fatalities
- 12 amputees among other trauma
- 1368 residential properties “red stickered”
- 1359 Commercial properties red stickered (including CPH)
- 90,000 people displaced
- 55,000 people not working from CBD
- Extensive damage to infrastructure:
  - Power (generally not phones)
  - Roads
  - Bridges
  - Reticulation system
  - Sewerage

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Immediate Local, Regional and National response
- Establish Emergency Operations Centres
- USAR
- Establish power
- Cordon/security
- Welfare centres
- Boil water notice
- Water tankers
- Portaloos

National Civil Defence Emergency declared on 23rd February 2011

Public Health Issues
- Sewage disposal/exposure to sewage
- Contamination of water supplies
- Food safety
- Disease outbreaks
- Warmth, shelter
- Welfare centres
- Chemical spills
- Social disruption, anxiety

Saturday 19 June 2011
- 7.1 aftershock
- 2 deaths
- Building damage
- Liquefaction
- Water and sewage system damage
- Power outages
- Boil water notice
- Welfare centre

Monday 13 June 2011
- 5.7 & 6.3 aftershocks
- 1 death
- Building damage
- Liquefaction
- Water and sewage system damage
- Power outages
- Boil water notice
- Welfare centre

Public Health Issues & Response

Monday 13 June 2011
- 5.7 & 6.3 aftershocks
- 1 death
- Building damage
- Liquefaction
- Water and sewage system damage
- Power outages
- Boil water notice
- Welfare centre

Coordinated Incident Management System (CIMS)
- Co-ordinated Incident Management System (NZ Fire Service 1998)
- Clearly specified roles for emergency response
- Control
- Communication
- Training

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Coordinated Incident Management System (CIMS)

- Incident Controller
- Liaison
- Communications
- Safety
- Operations
- Logistics
- Intelligence

Legislation

- Health Act 1956 S70/71
- Only during declared emergency
- Declaration re closure of schools, unsafe buildings
- Insanitary waterways, estuary, coastline, harbour
- New Zealand Food Safety Authority

Infection Control & Surveillance

- Welfare Centres
  - Recreation Centres; Race Course Complex
  - Directly linked to EOC
  - Oversight by St John (ambulance) & Red Cross
  - Infection Control advice and review by:
    - Specialist Infection Control Nurses
    - Public Health Staff
  - Hand hygiene, isolation
  - Link to Primary Care for General Practitioner review if required

Infection Control and Surveillance

- Welfare Centres
  - visited by HPOs daily to assess health status and provide advice (gastroenteritis, chicken pox, mental health issues).
- Gastroenteritis surveillance
  - All GPs in Canterbury asked to report any increase in gastroenteritis
  - Daily / alternate day surveillance by 19-34 sentinel GPs in the most affected areas for 10 days. No increase observed.
- ILI surveillance
- CATI survey
- Recovery

Situation Report

- Web-based Situation Report
- Password protected but accessible to Intranet and Internet users
- Published daily
- Emailed to CDEM, NHCC, CCC and a public health list

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E.coli transgression clusters

FAC residual
25.03.11 - Green dots >/= 0.2mg/L

Post-Quake Communicable Disease Surveillance
Gastroenteritis

<table>
<thead>
<tr>
<th>Data</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Notifiable diseases</td>
<td>Primary Care, Microbiology laboratory, national database</td>
</tr>
<tr>
<td>Number of faecal specimens</td>
<td>Microbiology laboratory</td>
</tr>
<tr>
<td>Attendances at hospital Emergency Dept</td>
<td>Hospital statistics</td>
</tr>
<tr>
<td>Gastroenteritis product distributed in community</td>
<td>Pharmaceutical warehouses</td>
</tr>
<tr>
<td>Public enquiries regarding gastroenteritis</td>
<td>HealthLine</td>
</tr>
</tbody>
</table>

Respiratory Illness

<table>
<thead>
<tr>
<th>Data</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Influenza-like illness</td>
<td>Sentinel primary care and after hours medical practices</td>
</tr>
<tr>
<td>Influenza virus identifications</td>
<td>Virology laboratory</td>
</tr>
<tr>
<td>Attendances at hospital Emergency Dept</td>
<td>Hospital statistics</td>
</tr>
<tr>
<td>Pneumococcal disease</td>
<td>Microbiology laboratory</td>
</tr>
<tr>
<td>Public enquiries regarding influenza-like illness</td>
<td>HealthLine</td>
</tr>
</tbody>
</table>

Surveillance Reports

- National database - table of notifiable communicable diseases
- Enteric report (local data)
- Respiratory report (local data)

Enteric And Respiratory Reports

- Summary comment of the current situation
- Graphs of various indices of incidence of enteric and respiratory diseases
- Initially daily then weekly

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Enteric Notifications

Weekly Attendances For Gastroenteritis At Christchurch Hospital Emergency Department: January - 30 September 2011

Gastroenteritis

Acute Gastroenteritis Notifications In Christchurch TLA: January - 30 September 2011 and 2008-2010 Average

Pneumococcal Notifications

Cumulative Christchurch Invasive Pneumococcal Disease Notifications January - 3 October: 2009-2011

HealthLine Calls For Influenza-Like Illness

7-Day Average Of The Ratio Of The Daily Call Volumes To Healthline For Influenza-like Illness in Canterbury 14 March To 2 October 2011 And The Call Volumes 1-21 February (1).

Recovery and the Community

- Boiling their water - 88% were still boiling water 6 weeks later
- Washing their hands - No outbreaks occurred at all
- Digging silt from liquefaction - The student army
- Providing equipment to assist - The “farmy” army
- Establishing their own welfare centres - Tradesmen helped build laundries etc
- Accommodating their neighbours - Many had to accommodate two or three families
- Sports clubs provided showers

- Face to face contact at community briefings
- Mailbox Leaflet drop
- Free phone lines
- Websites
- Media
- Public Health messages

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Recovery & public health

- Service reconfigured:
  - Information
  - Protection
  - Communities
  - Policy
- Working from home
- Regionalisation

Recovery Planning

- Not practised
- CDEM framework
- CPH Plan
- CDHB Plan

Recovery Planning

- A Holistic Framework for Recovery (Focus on Recovery)

Recovery

Version Two

Reflections

- Resilient community
- Preparation/Practice
- Engineers
- Recovery - the real test
- ‘Long Haul’