

Housing and Health: A Vital Connection



Dr Chris Bullen
School of Population Health
October 2008



‘The connection between health and the dwellings of the population is one of the most important that exists’

- Florence Nightingale 1820-1910

Pathways

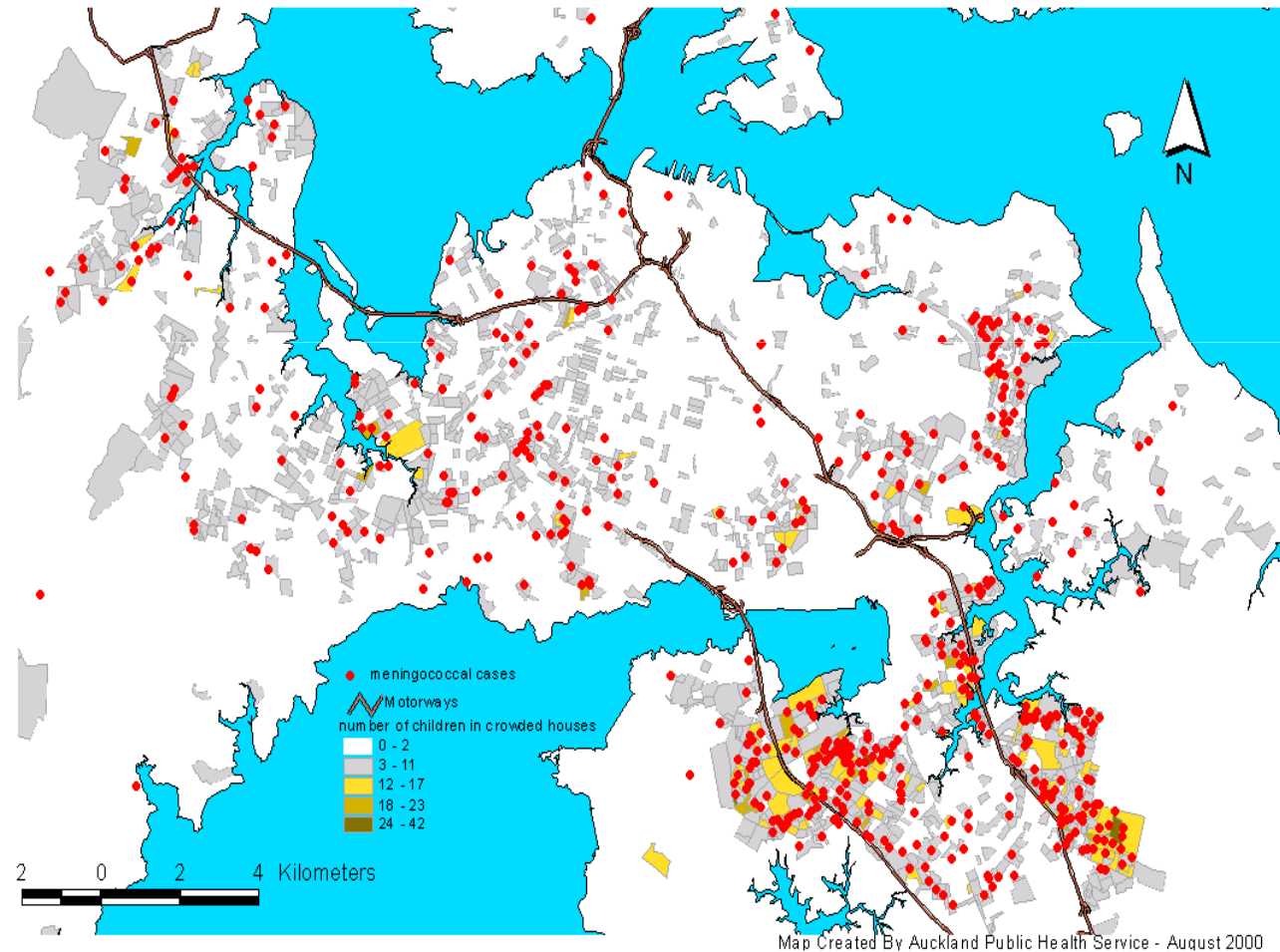
- **Crowding**
- **Cold**
- **Dampness**
- Noise
- Lead, asbestos
- Fires
- Other hazards
- Tenure
- Indoor air quality

Life course

“We give shape to our buildings, and they in turn shape us”

- Winston Churchill, 1943, in an address to the House of Commons

Meningococcal disease in Auckland children



Meningococcal Disease and crowding

- Crowding was strongest independent risk factor for developing MCD
- Most important measure was number of “adults” (> 10 years) / room
- Odds ratio 10.7, 95% CI 3.9 to 29.5
- For a family living in a house with 6 rooms
 - Increase adults by 2 - increase risk x 2
 - Increase adults by 4 - increase risk x 5
 - Increase adults by 6 - increase risk x 10.7

TB and crowding

- For every 1% increase in the average household crowding level of a neighbourhood there is an 8% increase in the expected TB count, assuming the other variables were held constant.
- People living in the most crowded 20% of neighbourhoods would expect to have a TB risk approximately 70% higher than those living in the least crowded quintile.

M Baker, D Das, K Venugopal and P Howden-Chapman. Tuberculosis associated with household crowding in a developed country. *J. Epidemiol. Community Health* 2008;62;715-721.

Damp Housing

- Related to temperature and ventilation
- Linked to allergen proliferation: mould, fungi, house dust mite, as well as bacteria and viruses
- Possible links to respiratory symptoms, skin conditions, eye irritation

Cold Housing

- Increased risk of respiratory illness, death from heart disease, hypothermia, injury, prolonged recovery following hospital discharge
- Those most likely to live in thermally inefficient housing are already at risk: chronically ill, unemployed, low income, & elderly
- Half of NZ homes are uninsulated
- 3% use no heating
- 30% are below the WHO guide of 16 degrees in winter
- 30% of heater users have unflued gas heaters

But what about the health impacts of housing *improvement*?

- **Associations of housing with health ‘self-evident’**
- **Reported associations suggest that interventions are required**

BUT

- **Need to look at health impacts of housing improvements**
- **Consider what is the best value for money i.e. what type of housing improvement will give the greatest health gain for each dollar invested?**



Health Outcomes

- Increased immunisation visits - 55% over 12 months after assessment
- Increased GP attendance 6% (for diabetes care and skin infection especially)
- Increased OPD attendance
- Reduced acute-housing related hospitalisations of 37% (2006 analysis CMDHB)

Source: UniServices HHP Pilot Evaluation Report 2001-2002.

Other Achievements

- Unmet housing, health and social support need identified and actioned
- Referrals; Liaison with CYFS and WINZ
- Sustained improvements in household environment
- Input into HNZC - 'healthier' housing design features; HNZC culture change: from 'Properties' to 'Households' focus

Residents' perspectives

- Positive changes in family life
- Participation in community activities
- Increased health and well-being
- Increased perception of safety and a sense of comfort
- Pride in their home
- Improved care of house

Housing, Insulation & Mould Study

- Single-blind cluster RCT of retrofitting insulation in homes with an occupant with a respiratory illness
- N=1400 homes, 7 locations in NZ, 4415 residents, 49% Maori, 25% Pacific
- Trained teams retrofitted ceiling and underfloor insulation, polythene ground cover and draft stopping around windows and doors -\$2000 per house

Findings

- Time below 10°C fell by 0.65 hrs per day vs increase of 0.11 hr per day in controls
- RH fell by 3.8% vs 1.5% in controls (p=0.007)
- 23% less power use
- Self-reported feeling cold x4 in controls than intervention group
- Reduced mouldy smell but no change in colony counts
- Time of school and time off work fell significantly
- Hospital visits by adults fewer in intervention group
- CBA suggests benefit: cost ratio 2:1
(tangible and energy benefits, PV terms, 5% discount over 30 yrs)

Housing, Heating and Health Study

- Trial of heater substitution to reduce asthma events in 409 NZ children with asthma
- Unflued gas heaters (30% of NZ homes)
- NO_x exposure increases severity of asthma when associated with viral RTIs
- Heat pumps, flued gas heaters or wood pellet burners substituted for unflued gas heaters in 5 communities - Hutt Valley, Porirua, ChCh and Dunedin
- No change in lung function but days off school less, fewer visits to Dr for asthma, less poor health, less wheeze and cough
- Living Room temp increased by 1.1 degree and bedroom temp by 0.6 degrees
- Lower NO_x

Opportunities

- Housing is a key setting for reducing health inequalities
- Small changes have the potential for large population health gain
- New Zealand is playing a key role in building the evidence-base
- More needs to be done to put evidence into practice
- Best buy = retrofitting insulation
- Banning unflued gas heaters

A parting challenge

‘.. If a wealthy nation does leave any of its citizens in poor, unhealthy, substandard housing the issue is one of choice, not necessity. It means that government and people alike have not given the provision of homes the attention and priority which in justice, in humanity, in dignity and in compassion, they require.’

-Barbara Ward, 1976