

Bronchiectasis:

Assessment, management, prevention.

Kyle Perrin

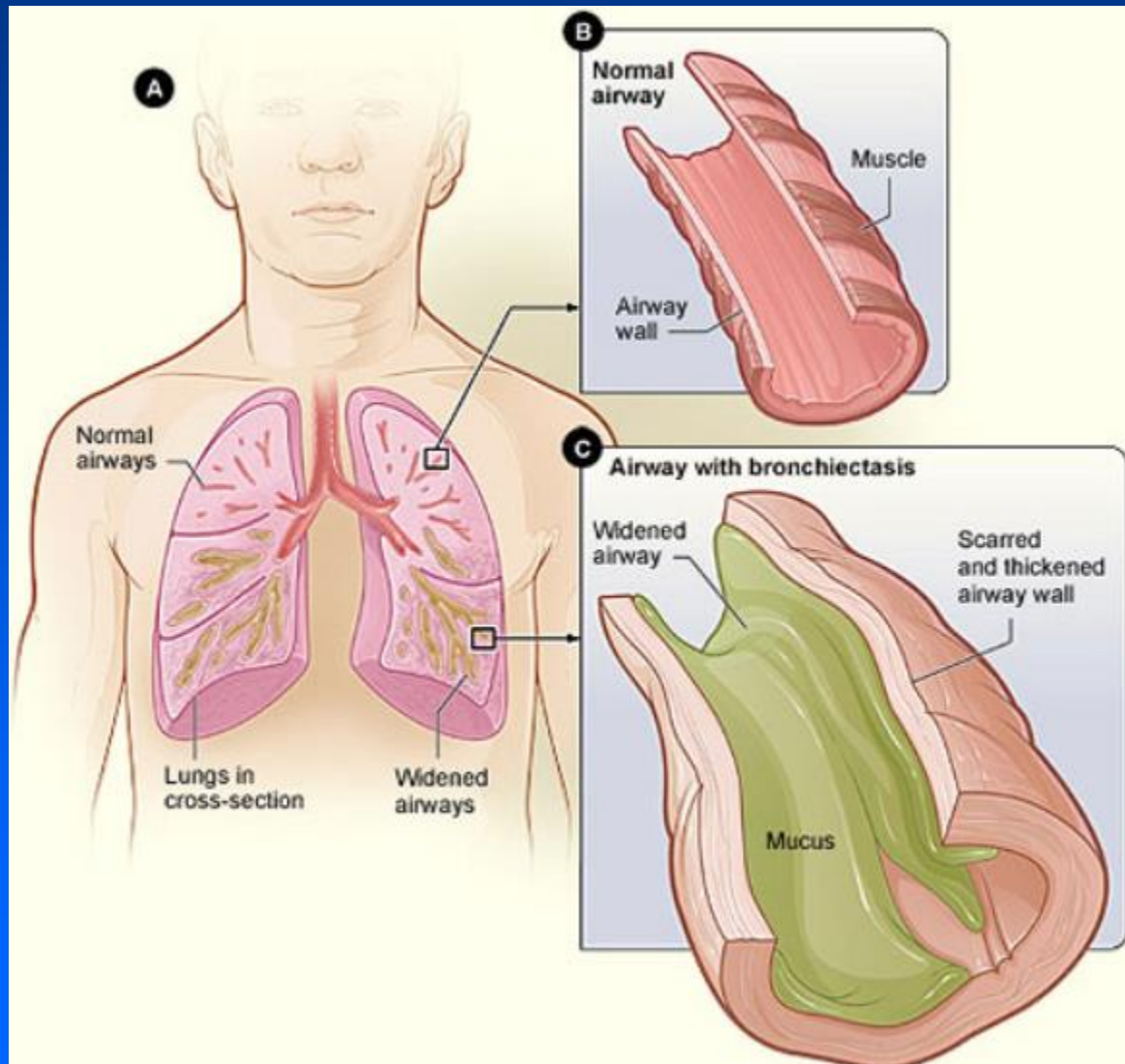
Overview

- Risk factors
- Diagnosis
 - History
 - Examination
 - Investigations
- Approach to management
- Prevention

What is bronchiectasis?

- Irreversible dilation of the bronchial tree caused by destruction of the muscle and elastic tissue
- It is classified as an obstructive lung disease

Pathogenesis



Prevalence

Arch Dis Child 2005;**90**:737-740 doi:10.1136/adc.2004.066472

Acute paediatrics

New Zealand national incidence of bronchiectasis “too high” for a developed country

J Twiss^{1,2}, R Metcalfe², E Edwards^{1,2}, C Byrnes^{1,2}

Prevalence

- An overall incidence of 3.7 per 100 000 under 15 years
 - NZ European 1.5
 - Maori children 4.8
 - Pacific children 17.8
- 7 times higher than Finland
- The median age at diagnosis was 5.2 years; the majority had symptoms for more than two years
- Mean FEV1 of 77% predicted

Risk factors

- Recurrent chest infections
 - Especially whooping cough
- Foreign body
- Congenital or acquired immune deficiency
- Congenital problems of cilia function

History

- Previous
 - Frequent childhood infections?
 - Other infections? (sinus, skin)

- Current
 - Recurrent chest infections
 - Chronic production of purulent sputum
 - Haemoptysis
 - Wheeze
 - Breathlessness

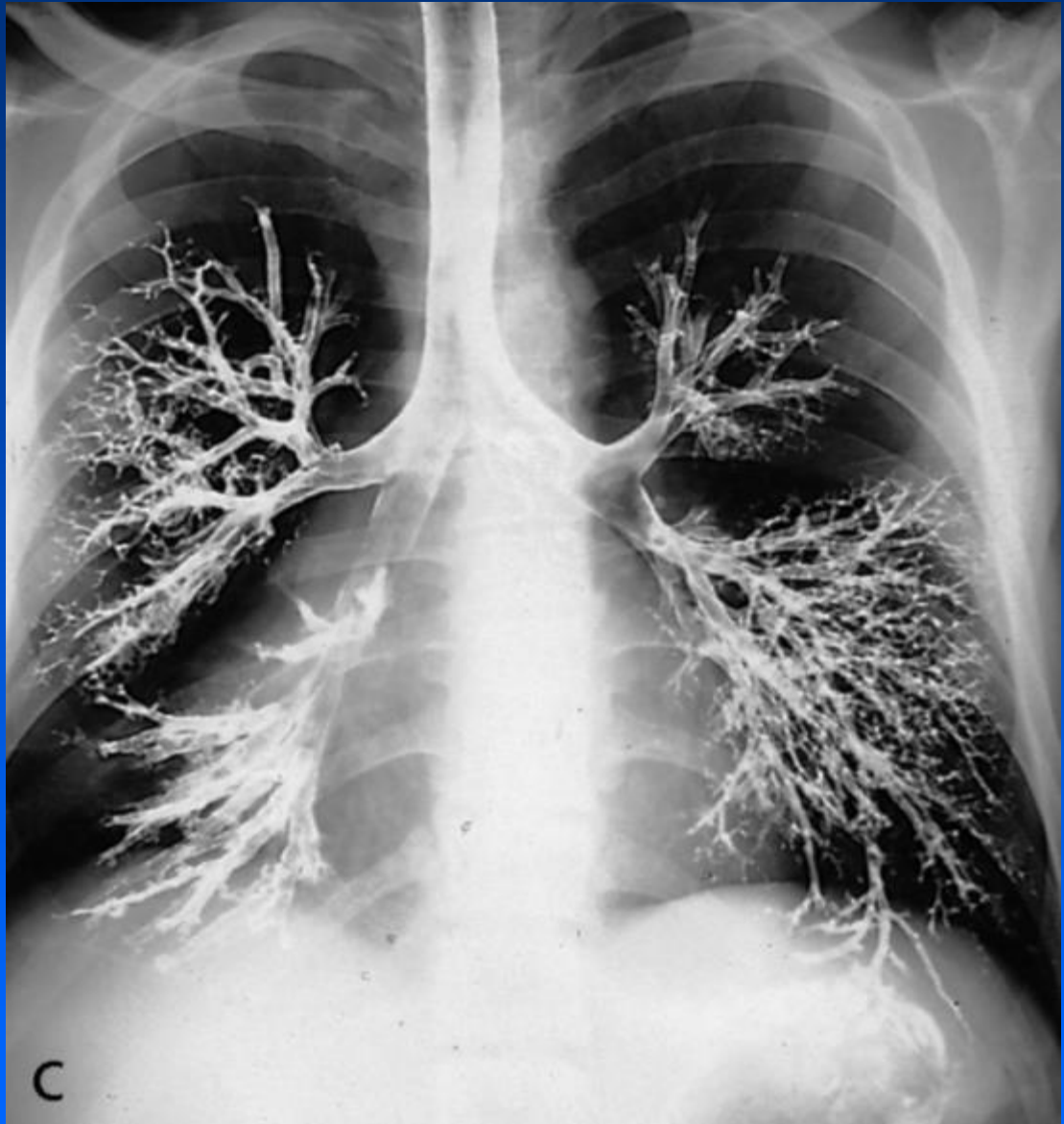
Examination

- Sometimes finger clubbing
- Hyperinflation (in severe disease)
- Thick/coarse crackles
- Occasional wheeze

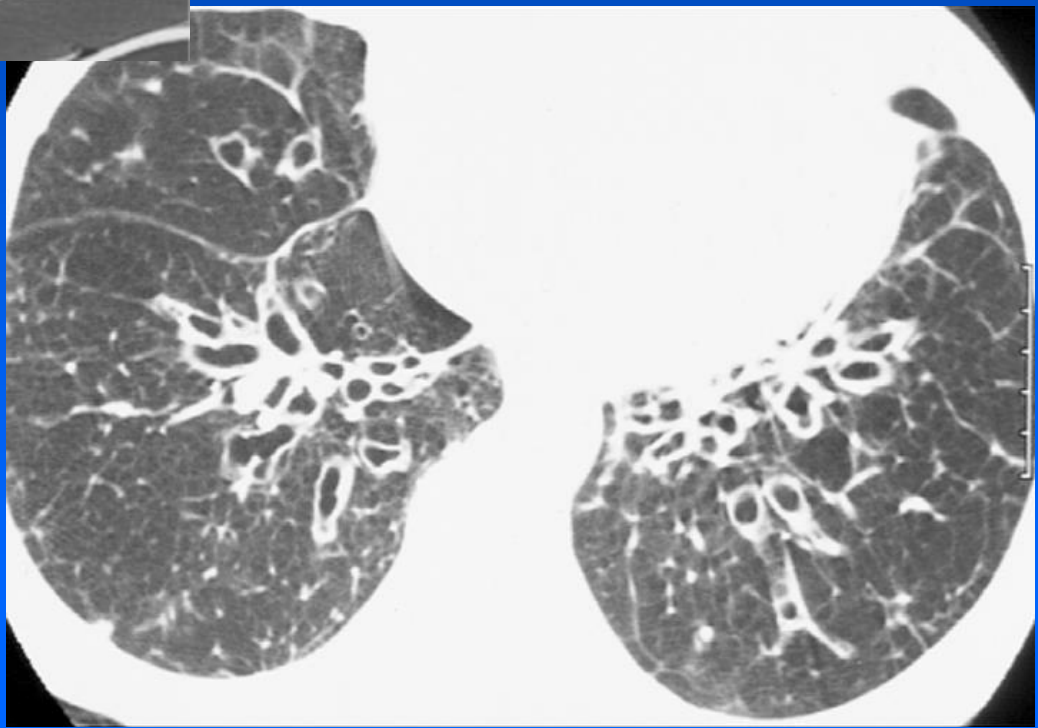
Investigations

- Spirometry
 - Obstructive, but may be normal
- CXR and CT scan
- Blood tests (immune deficiency?)
- Sputum test
- Test for CF?





RIGHT



Goals of treatment

- The treatment goals in adults are to
 - Control symptoms
 - Enhance quality of life
 - Reduce exacerbations
 - Maintain pulmonary function

Goals of treatment

- There is clear evidence that patients with bronchiectasis who have more frequent exacerbations have worse quality of life and worse prognosis

Treatment

1. Education
2. Treatment of the specific underlying cause
3. Airway clearance
 - Physiotherapy and exercise
 - Inhaled therapies

Treatment

4. Airway drug therapy
 - Bronchodilation
 - Anti-inflammatory
5. Antibiotic therapy
6. Surgical management
7. Management of complications

Airway clearance

- All patients with a productive cough should be taught airway clearance by a physiotherapist
 - Active cycle of breathing techniques
 - Postural drainage
 - Positive expiratory pressure (PEP)
 - Acapella
- Duration?
- Frequency?

Inhaled drug therapy

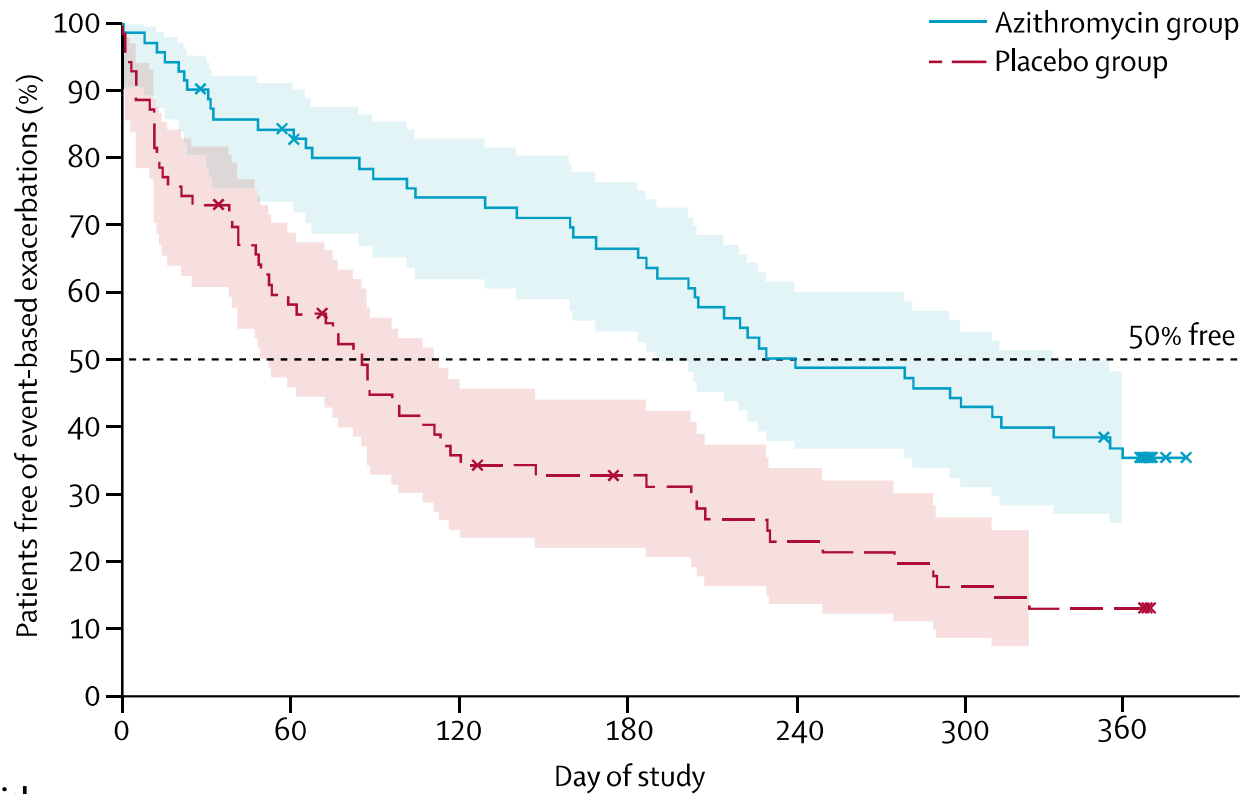
- Mucolytics
 - Pulmozyme (only effective in CF)
 - Mannitol
 - Hypertonic saline
- Bronchodilators
- Inhaled corticosteroids

Long term antibiotics

- Nebulised tobramycin
- Oral azithromycin

Azithromycin for prevention of exacerbations in non-cystic fibrosis bronchiectasis (EMBRACE): a randomised, double-blind, placebo-controlled trial

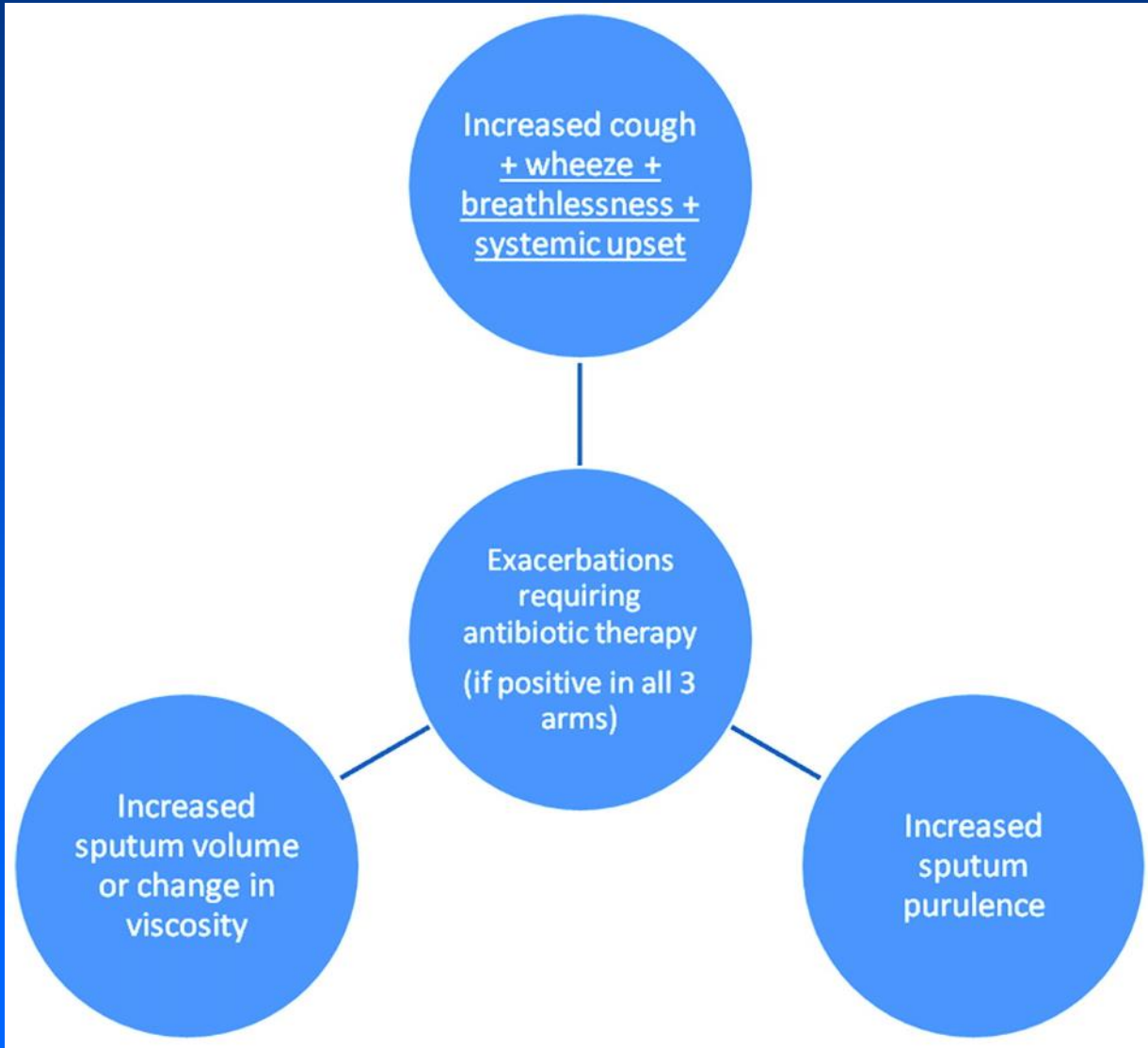
Conroy Wong, Lata Jayaram, Noel Karalus, Tam Eaton, Cecilia Tong, Hans Hockey, David Milne, Wendy Fergusson, Christine Tuffery, Paul Sexton, Louanne Storey, Toni Ashton



Number at risk		Day of study					
	0	60	120	180	240	300	360
Azithromycin group	71	58	50	45	33	29	
Placebo group	70	40	24	20	14	10	

Figure 2: Proportion of participants free from event-based exacerbations
 Shaded areas indicate 95% CIs. Crosses indicate censoring.

Exacerbations



Need for admission

- Unable to cope at home
- Hypoxia or confusion
- Breathlessness with respiratory rate $\geq 25/\text{min}$
- Respiratory failure
- Temperature $\geq 38\text{ C}$
- Unable to take oral therapy

Antibiotics for exacerbations

- If possible guided by previous sputum results
- Common bacteria include
 - *H influenzae*, *M catarrhalis*, *S aureus* and *S pneumoniae*
 - Some patients become colonised by pseudomonas
- If no sputum culture available
 - Send a sputum sample first!
 - Augmentin or amoxicillin is a reasonable first choice
 - Modify if necessary

Other treatments

- Nutrition
- Vaccinations
- Pulmonary rehabilitation
- Surgery
- Lung transplant

A case

Hannah age 16

- Asthma and eczema since age 3
- Whooping cough infection age 6
- Last 3-4 years had recurrent chest infections and always coughs up green sputum
- Off school a lot
- CT scan confirmed bronchiectasis

Current medications

- Seretide 2 puffs bd
- Lotatadine 10mg od
- Montelukast 10mg od
- Flixonase 2 puffs bd
- Theophyline 250mg od

Social history

- Lives in a private rental house with mum, aunty and 4 other kids
 - No insulation
 - Damp
 - A bit of mold around
- Mum works as a cleaner
- Cant afford to heat the house very often

Prevention of bronchiectasis

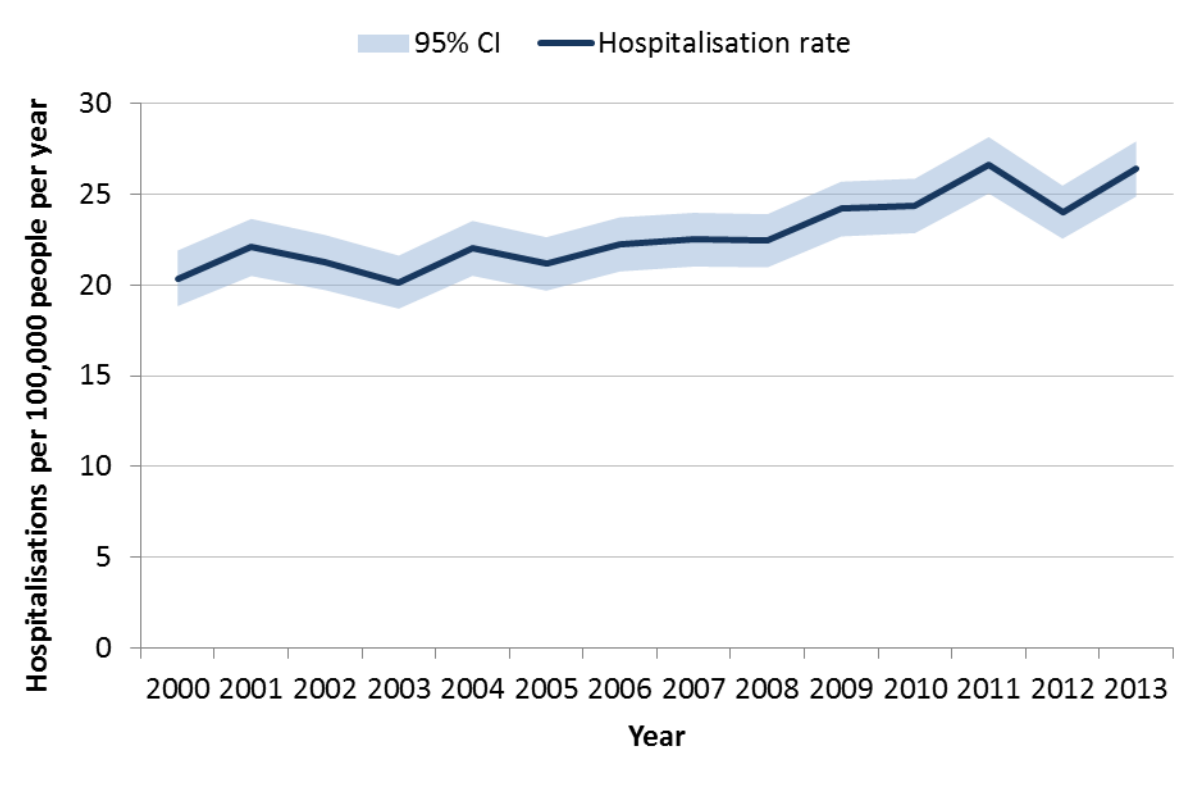
How do you avoid it in NZ?

Why is this important?

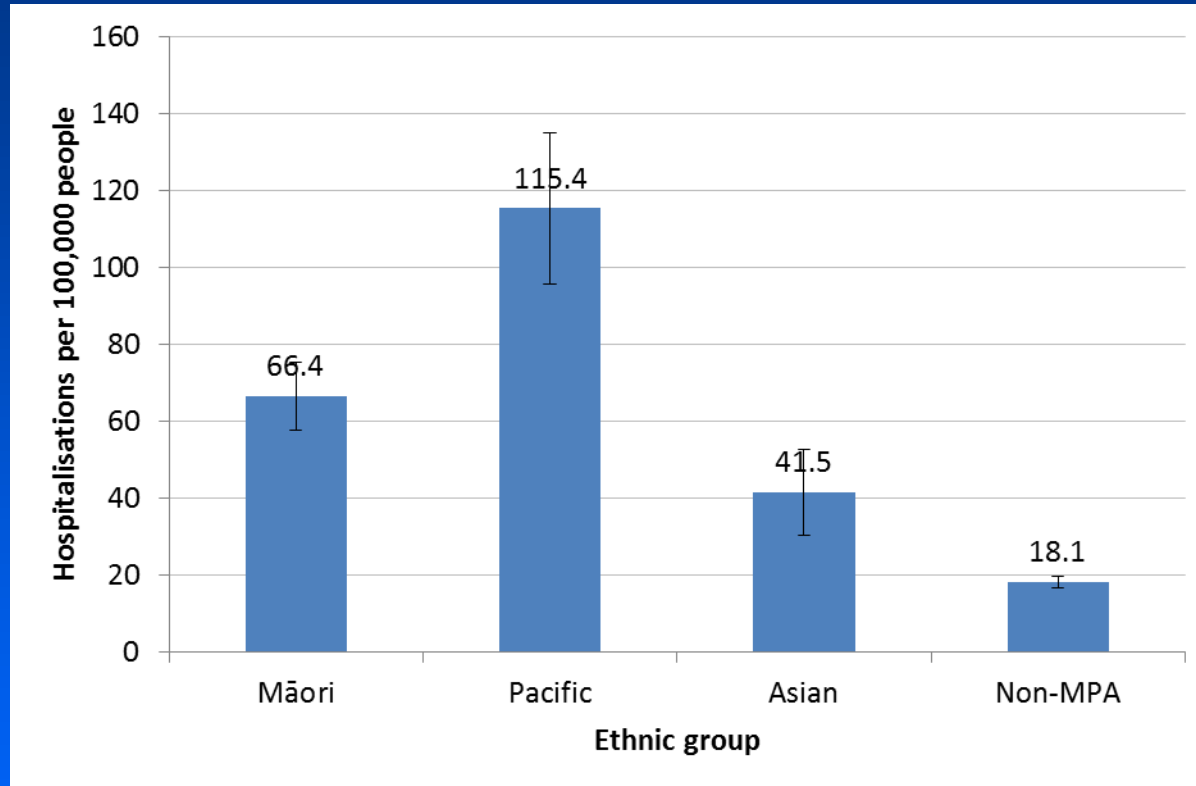
- Bronchiectasis is a disease of poverty and a marker of social deprivation
- Like rheumatic fever, it is a “ticking time bomb”

Why is this important?

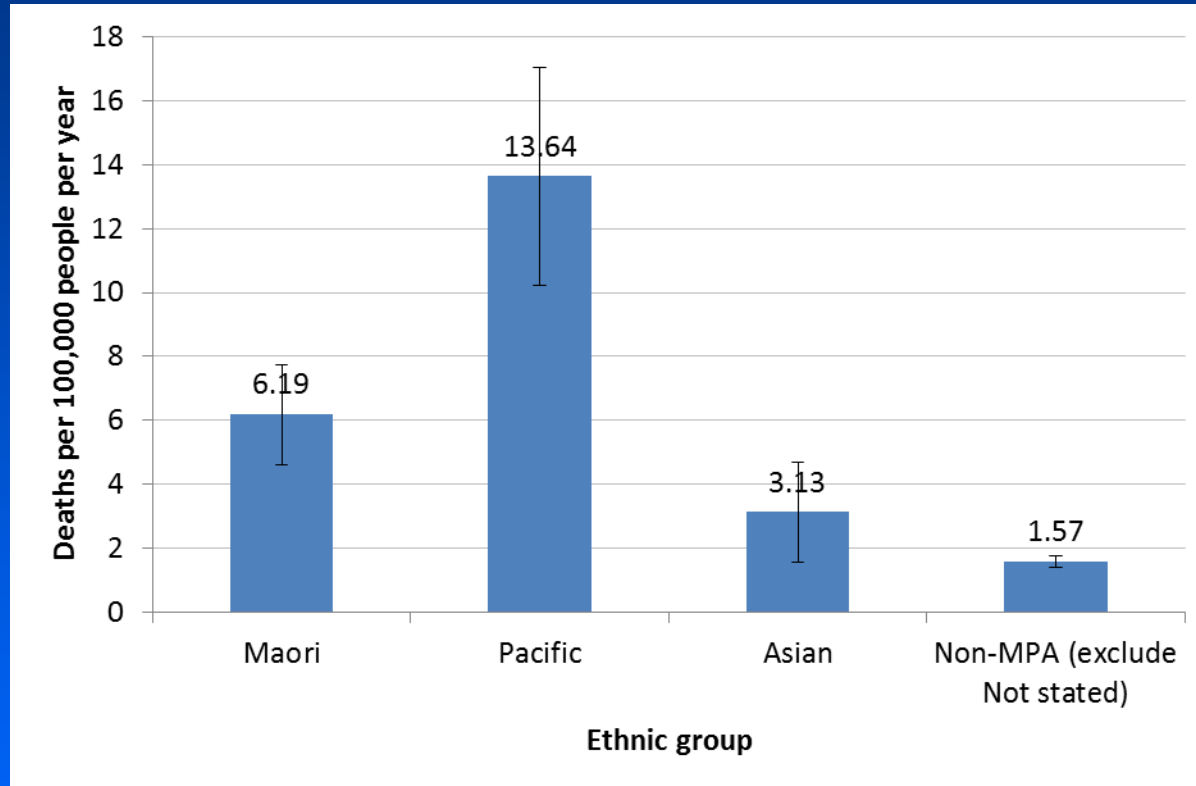
- It often starts in childhood but the worst effects are seen in adulthood
 - Frequent hospital admissions
 - Poor quality of life
 - Early death



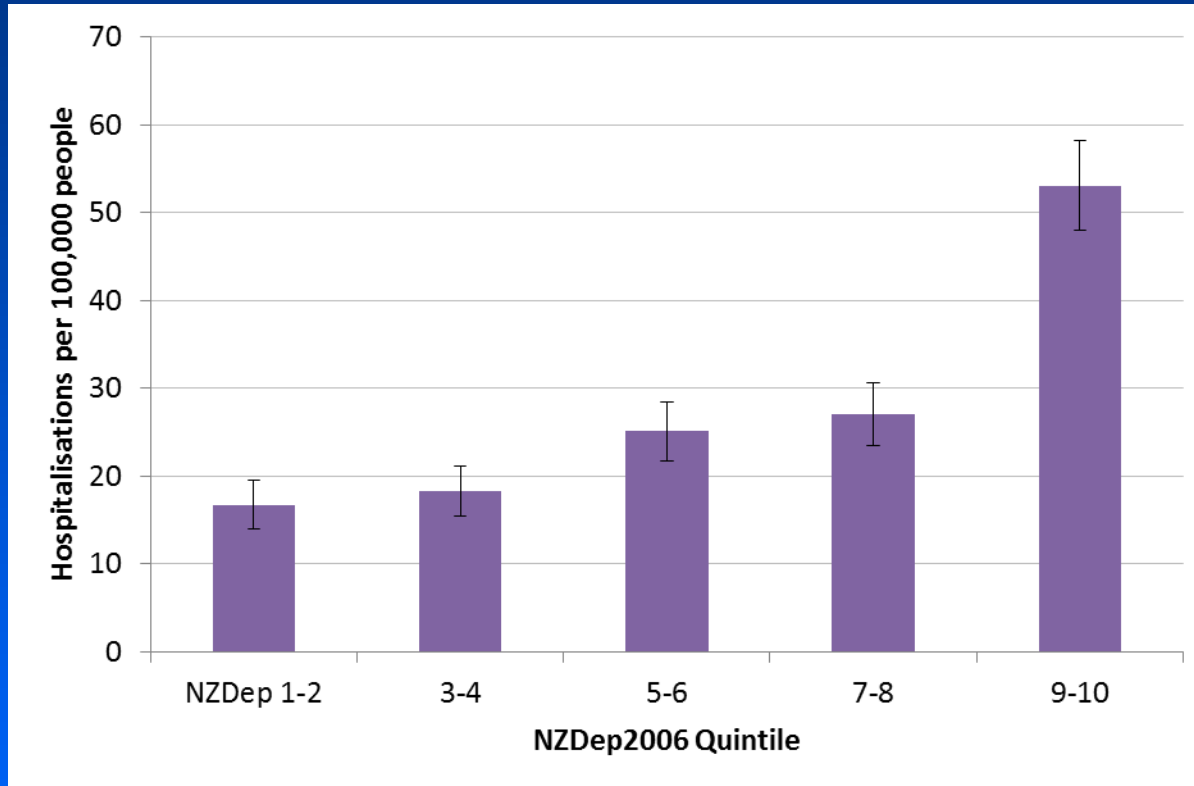
Hospitalisations by ethnic group, 2013



Mortality by ethnic group



Hospitalisations by deprivation, 2013



Why such a concern in NZ? comparative data



At diagnosis	Australia	Alaska	NZ
Bilateral disease	15.3% 50%	38% 57%	83% 87%
Widespread disease			64%

Munro K, Current Paeds 2009

What to look out for?

- Cough – persistent, recurrent, wet
- Recurrent resp infections
- Hospital admissions for LRTI
- Recurrent antibx use
- School absenteeism
- SOB with sport
- Asthma – poorly responsive
- Growth



Don't wait!

2003 (14 month female)



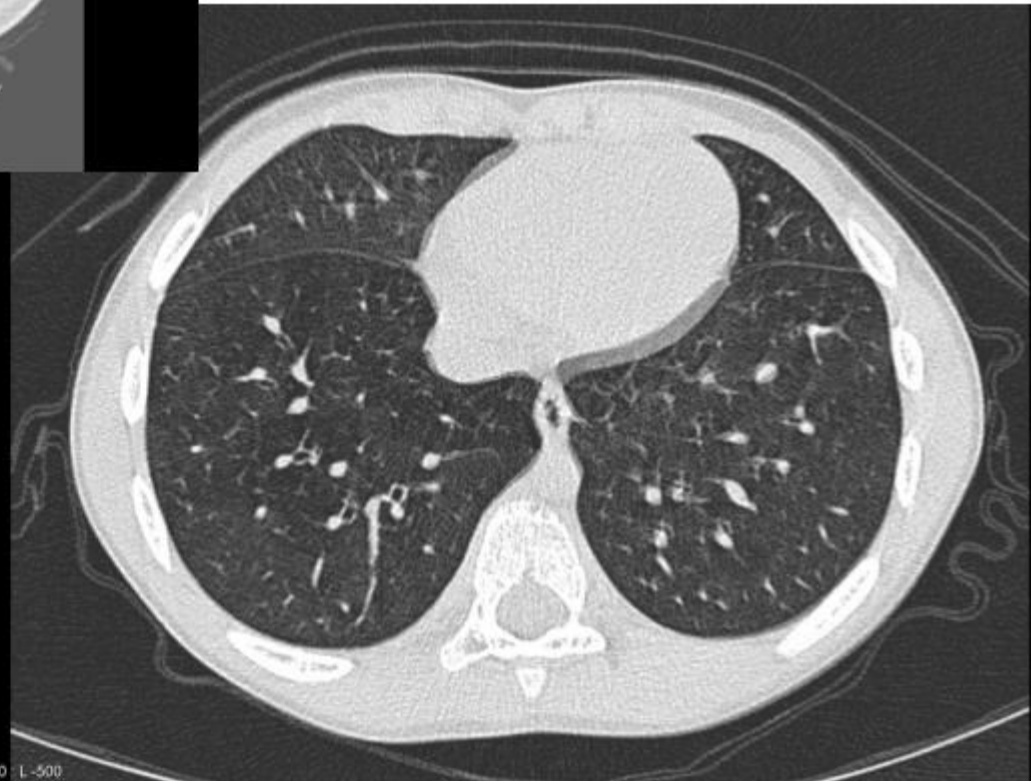
2008



2004 (11 month male)

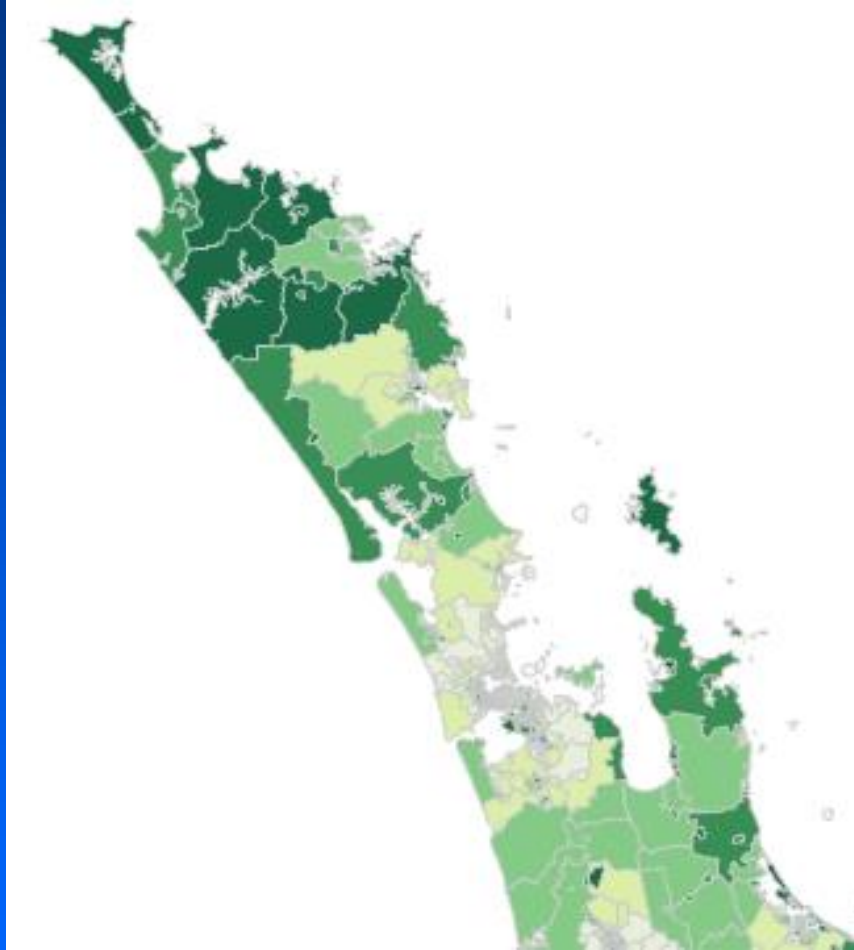


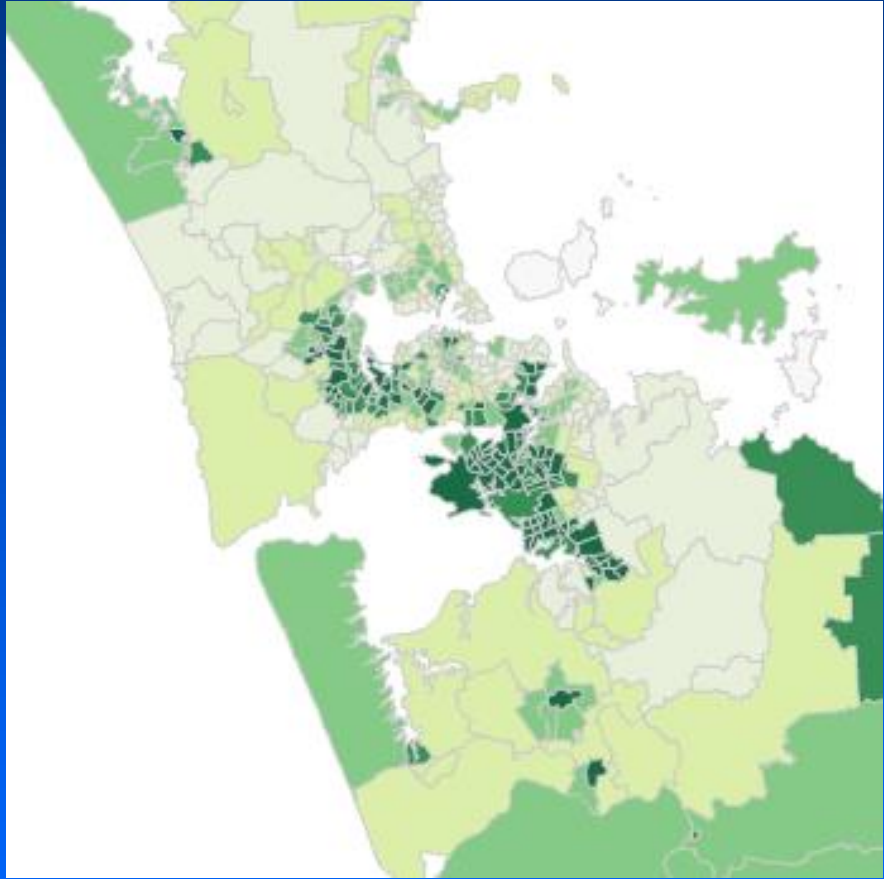
2008

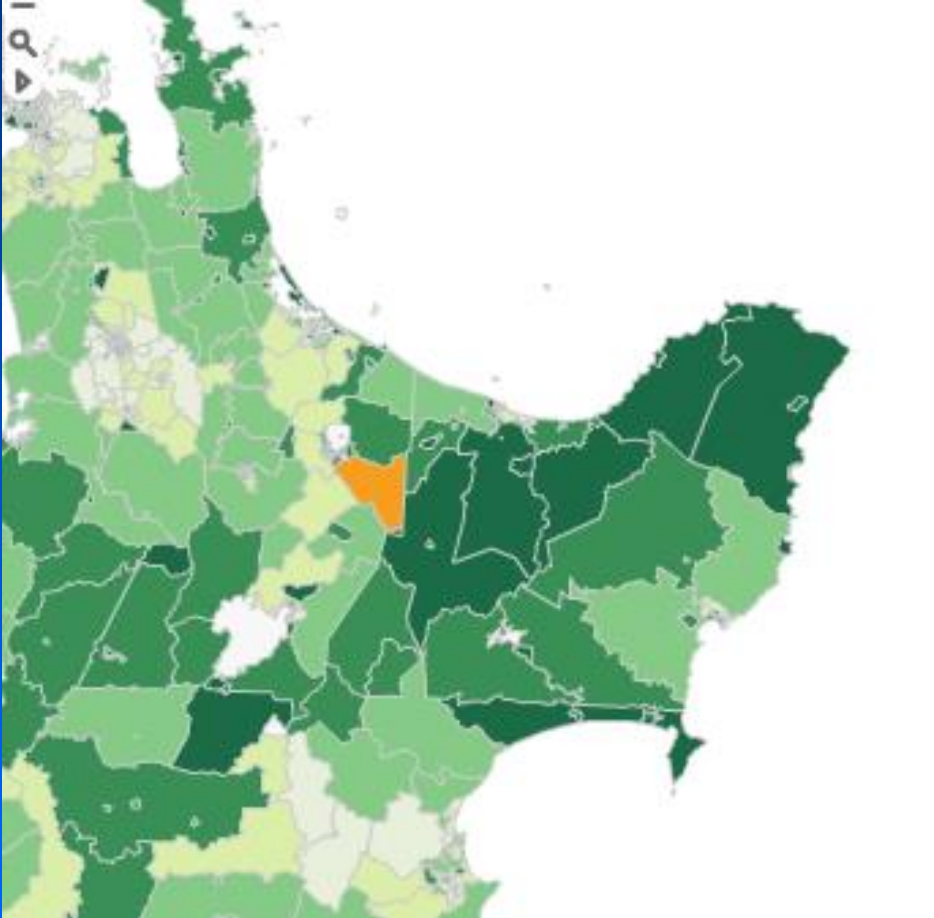


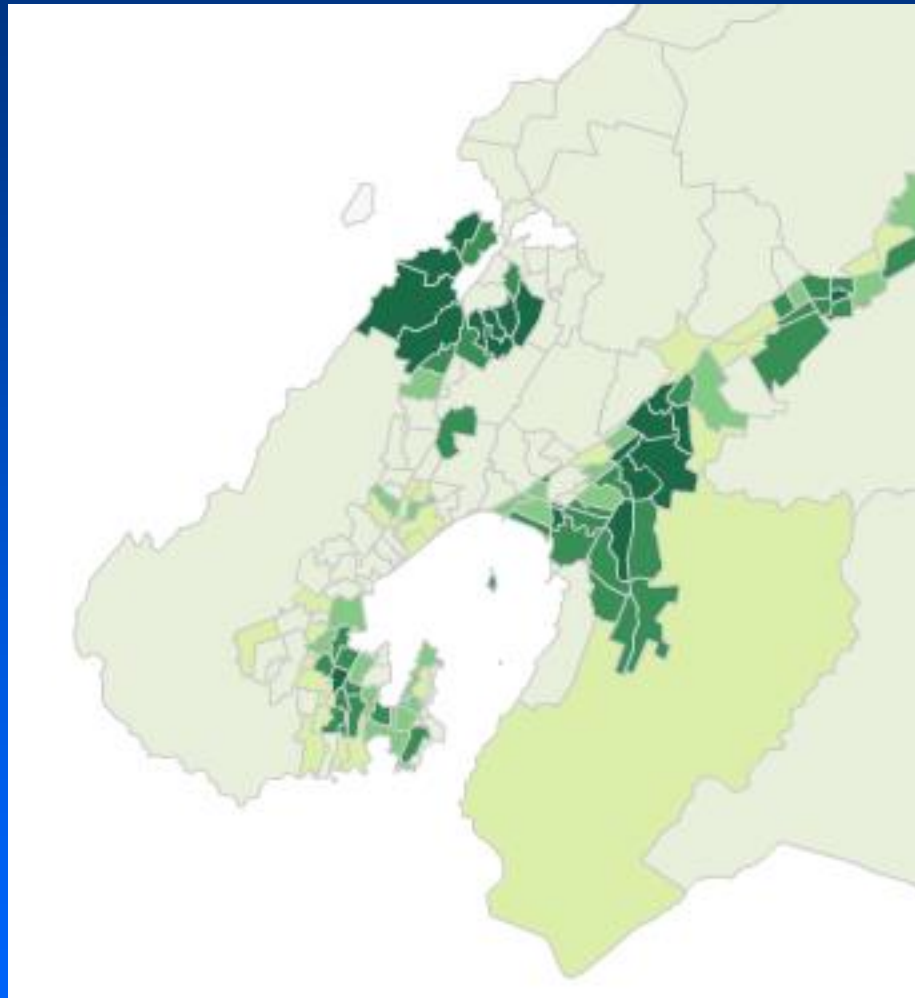
W 2217 : L -673

W 1600 : L -500









Priorities

- The current approach to treatment of existing bronchiectasis patients has not changed a great deal in decades
- We must take steps to reduce the incidence of this condition by addressing the social determinants of health particularly among Maori and Pacifica

Priorities

- Housing
- Income inequality
- Access to primary care
- Health literacy
- Smokefree Aotearoa 2025