

Poverty as a driver of Emerging Infectious diseases

Responding to Emerging Infectious Diseases
University of Otago, 7 February 2017

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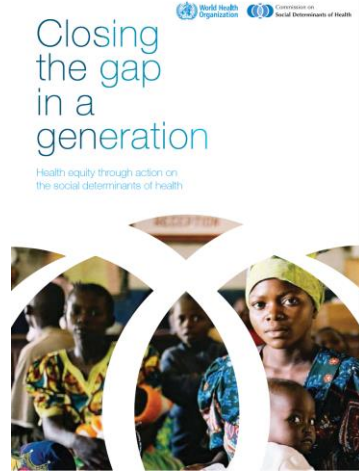


Outline

- Key terms: Social determinants, Poverty, Deprivation, Inequalities
- Poverty and Infectious Diseases
- Poverty and Emerging IDs
- Pathways linking Poverty and IDs
- Reducing inequalities in IDs
- Conclusions



Key terms



Social determinants of health

The circumstances in which people are born, grow up, live, work and age, and the systems put in place to deal with illness. These circumstances are in turn shaped by a wider set of forces: economics, social policies, and politics

*Source: Commission on Social Determinants of Health, 2008.
Geneva, World Health Organization.*

Key terms

Poverty

A condition of absolute or relative deprivation of material and cultural resources.

- Absolute poverty refers to the condition in which the basic resources necessary to sustain life are lacking;
- Relative poverty is the lack of resources in comparison with other members of a given society

Source: Porta, M. Editor. A dictionary of epidemiology. 6th ed. 2014

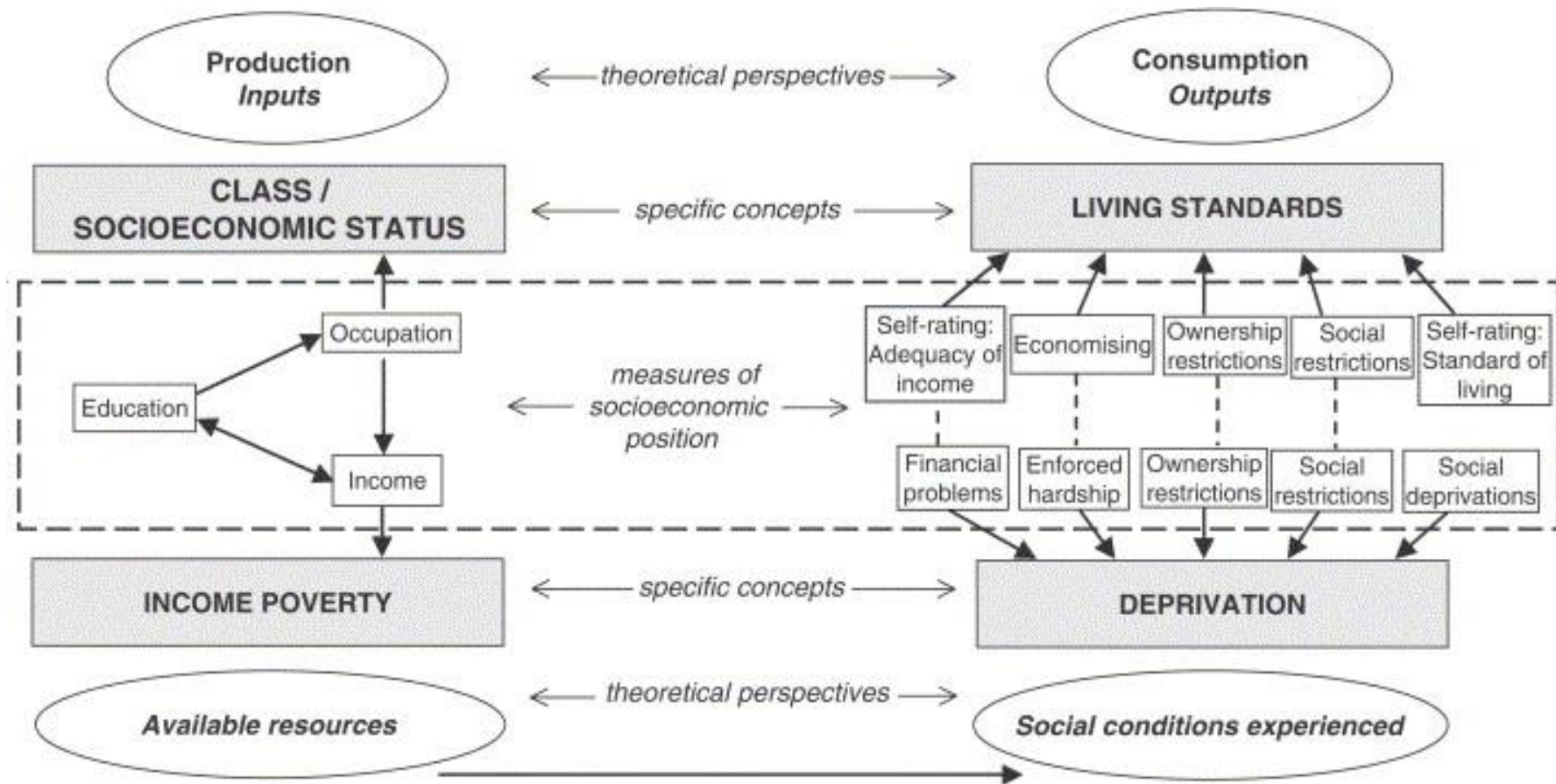
Key terms

Deprivation

- A measure of poverty.
- Frequently uses social deprivation indices based on multiple variables: low income/unemployment, low education, dependency, and lack of material resources (eg no car, rental housing, overcrowding)
- Often assigned with an area based index derived from Census data, eg NZDep (NZ)

Key terms

Measuring poverty

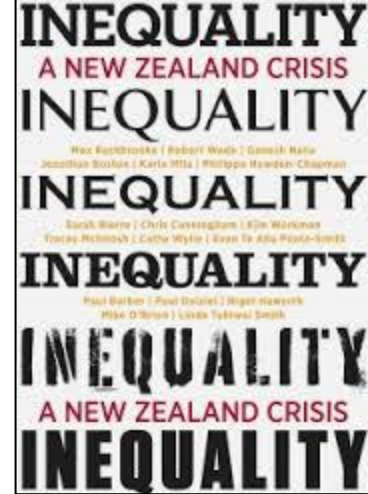


Key Terms

Health inequalities

Differences in health status or in the distribution of health determinants between different population groups.

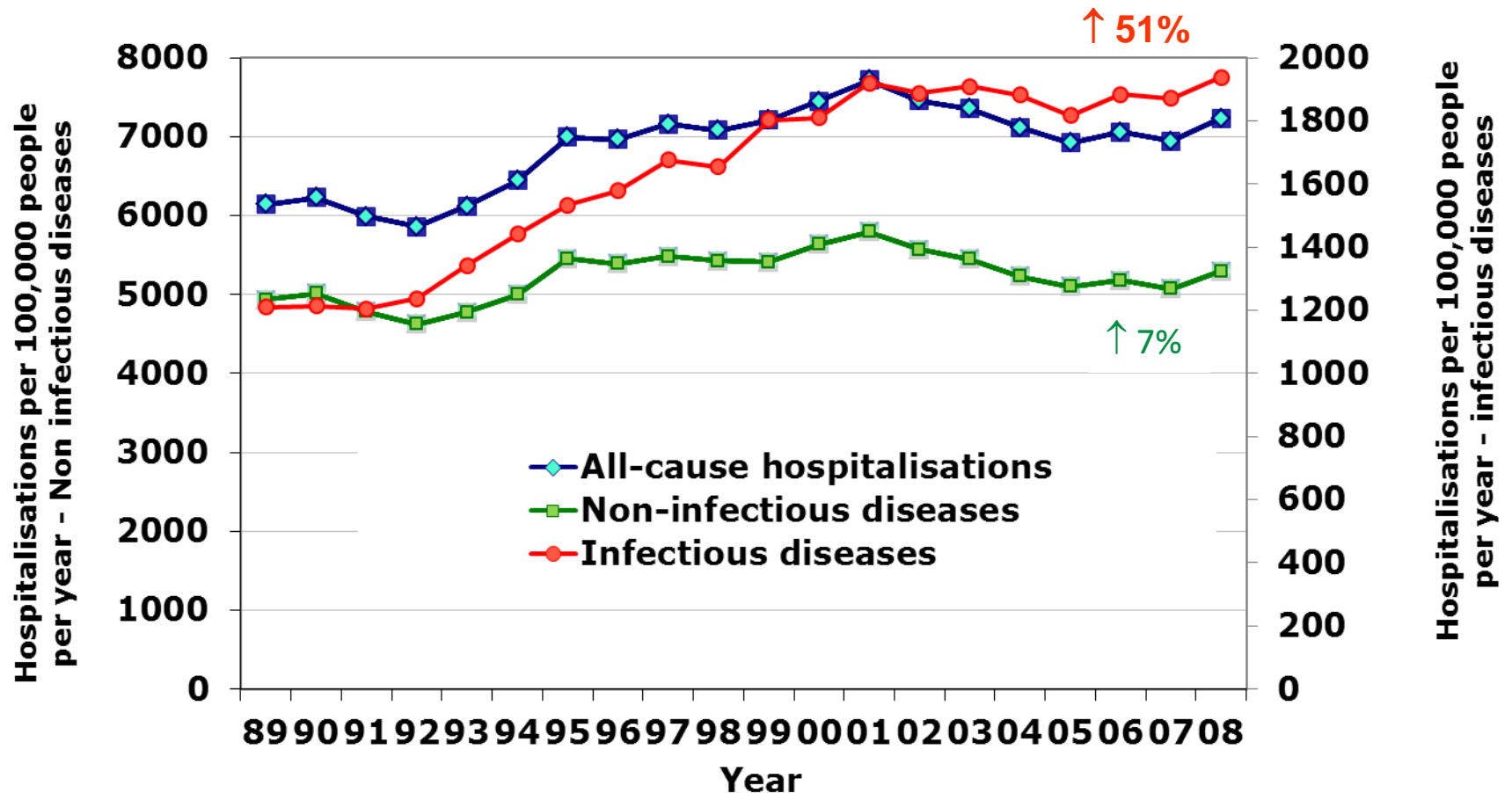
Include **Health inequities**: attributable to ... the external environment and social conditions outside the control of individuals and are unnecessary and avoidable as well as unjust and unfair.



Source: Porta, M. Editor. A dictionary of epidemiology. 6th ed. 2014

Poverty and IDs

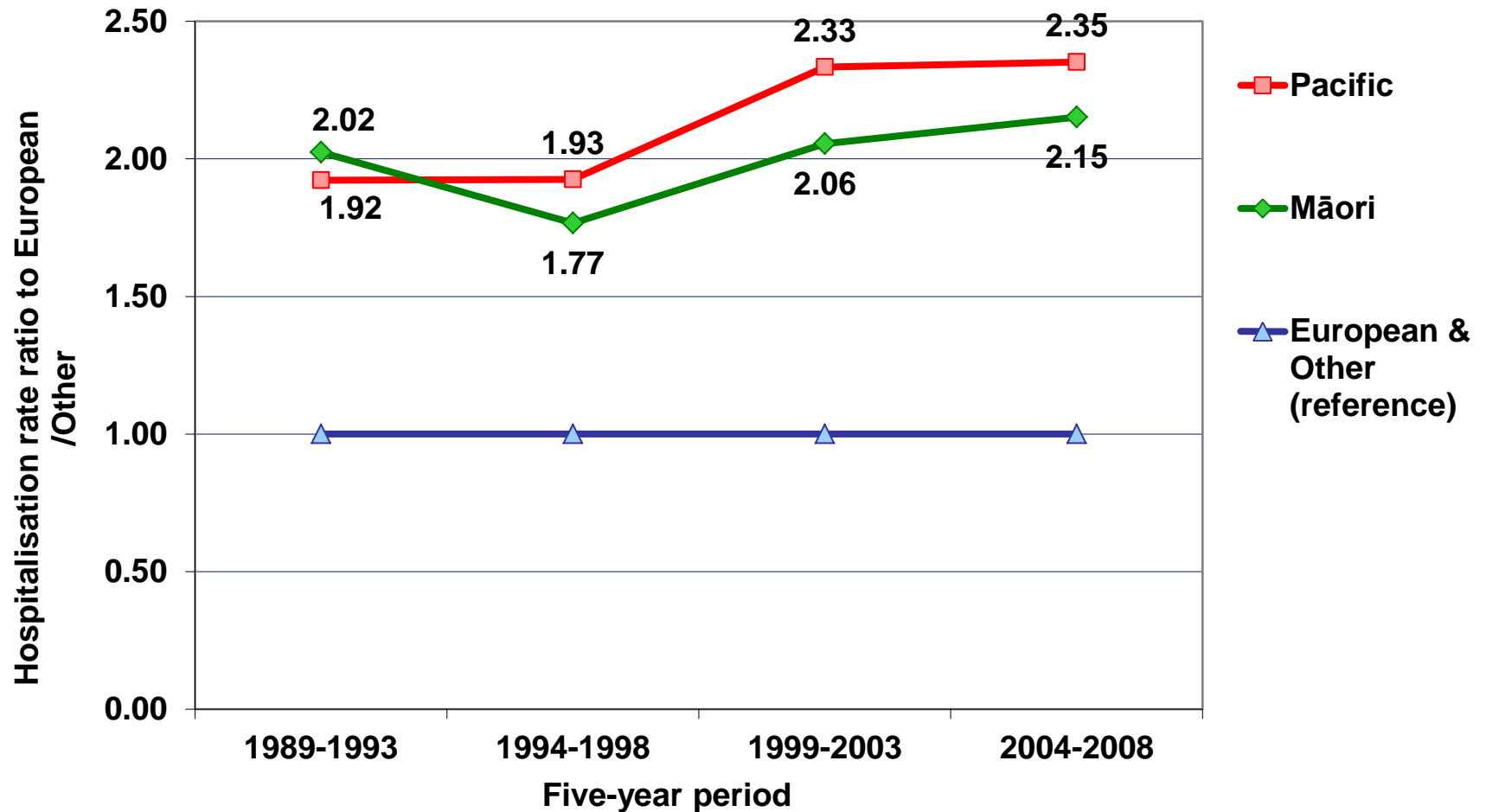
ID hospitalisations compared with Non-ID & All-cause, 1989-2008 (age stand. to 2006 Census)



Source: Baker et al. Lancet 2012; 379, 1112 – 19

Poverty and IDs

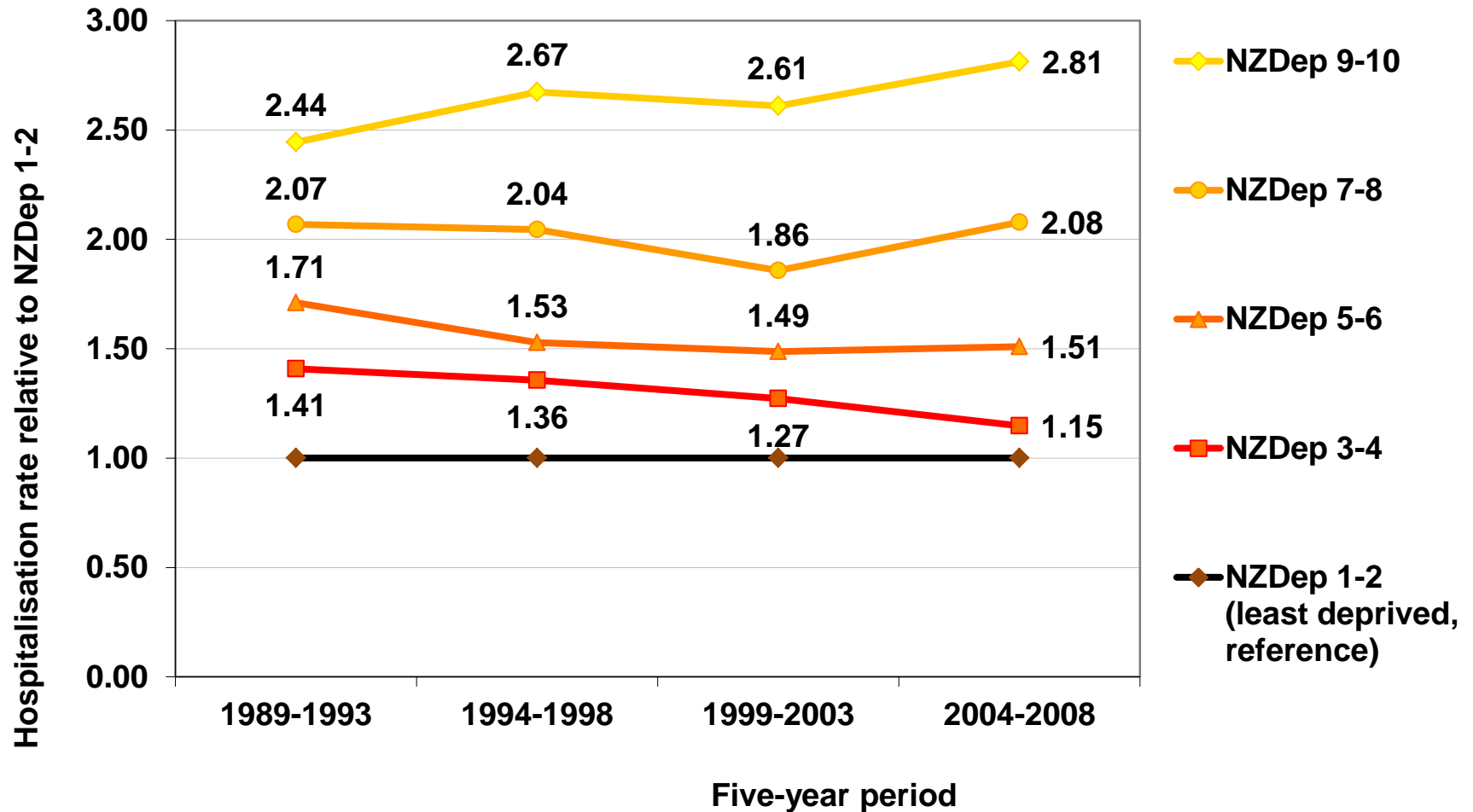
Ratio of Māori & Pacific ID hospitalisation rates to European/Other, 1989-2008



Source: Baker et al. Lancet 2012; 379, 1112 - 19

Poverty and IDs

ID hospitalisation rates by NZDep quintile, ratio to least deprived, 1989-2008

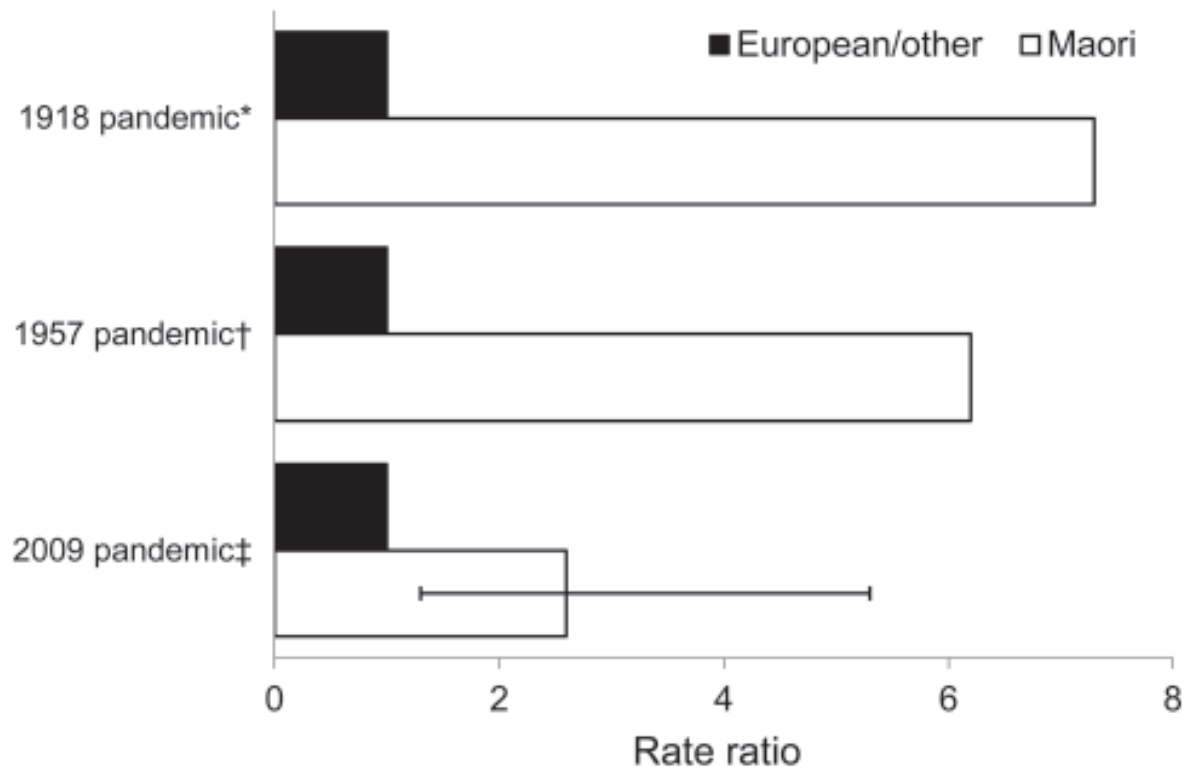


Source: Baker et al. Lancet 2012; 379, 1112 - 19

Poverty and Emerging IDs

Ethnic inequalities in Pandemic Influenza

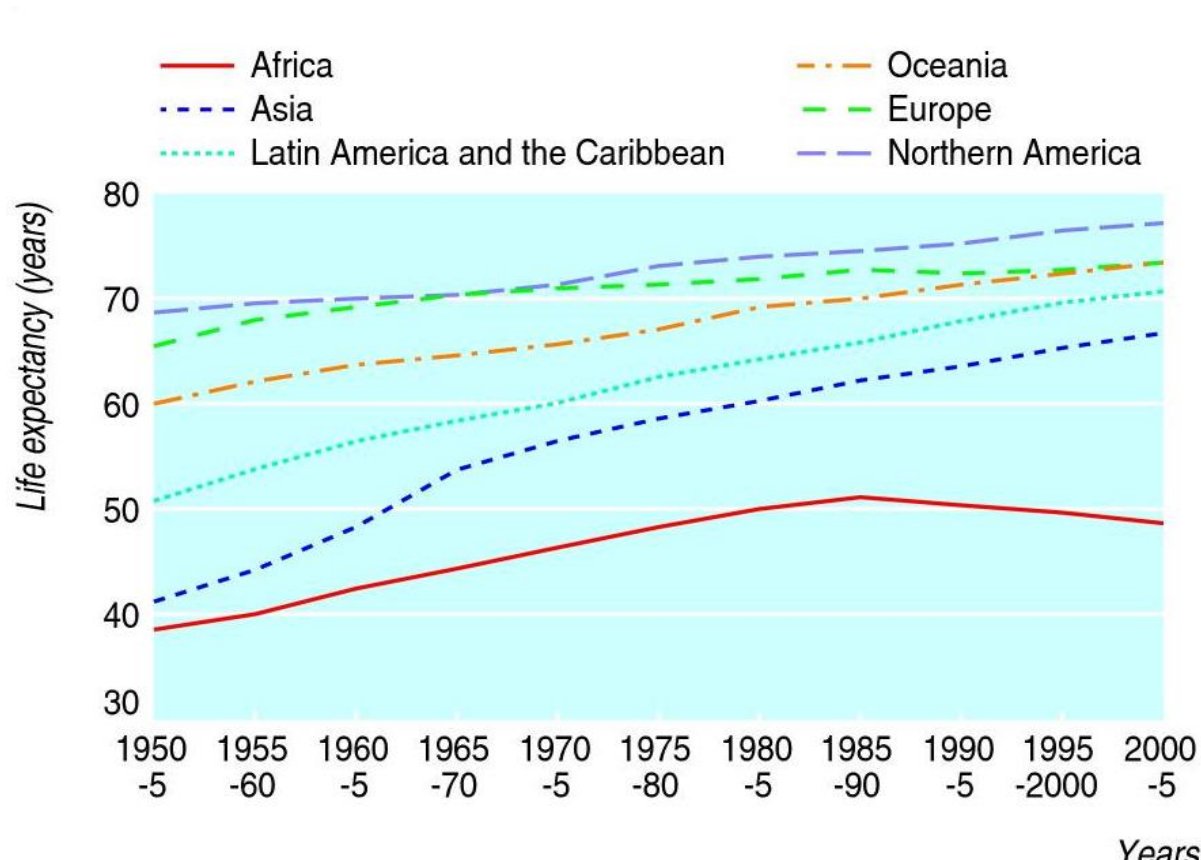
Rate ratio for NZ Maori mortality in 3 influenza pandemics



Source: Wilson, Telfar Barnard, Summers, Shanks, Baker. Emerg Infect Dis 2012; 18: 71-77

Poverty and Emerging IDs

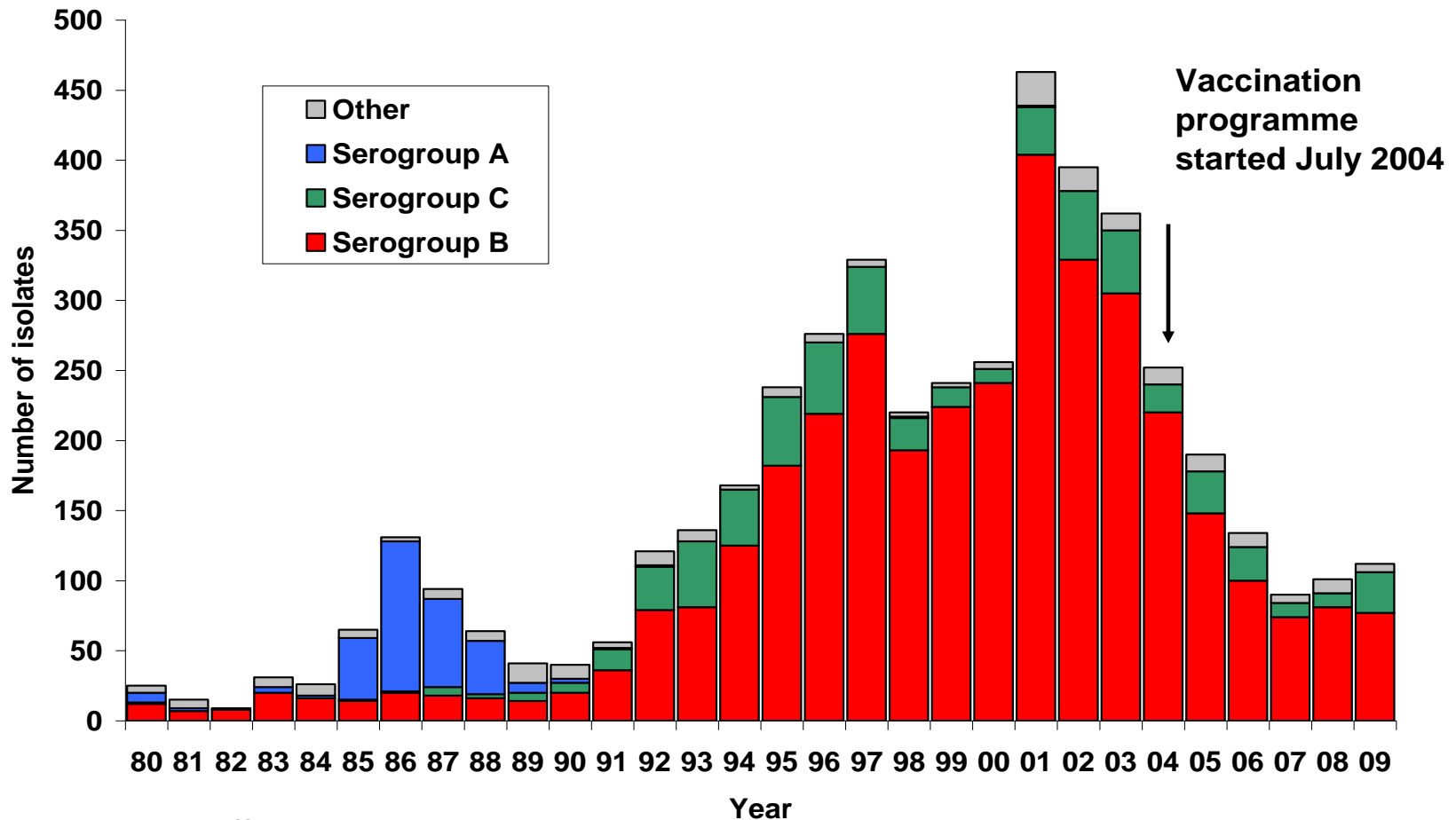
From 1980-2005 HIV/AIDS altered life expectancy across the globe → 6 years of difference in life expectancy between Africa and North America



Source: Dowling, BMJ 2006 332: 662–64

Pathways linking Poverty & IDs

Meningococcal disease epidemics



Source: ESR surveillance reports

HEIRU

Health Environment Infection Research Unit
University of Otago

Pathways linking Poverty & IDs

Meningococcal disease in NZ

- Case-control study of meningococcal disease in Auckland children < 8 years during 1997-99
- 202 cases and 313 controls
- Overcrowding, measured by number of adults aged ≥ 10 years per room, most important risk factor for disease [OR = 10.7; 95% CI, 3.9 to 29.5]

*Source: Baker, et al. Paed Infect Dis J
2000; 19: 983-90*



Pathways linking Poverty & IDs

Meta-analysis of Household Crowding & IDs

Disease/category	N	Case-control (cross-sectional studies*)	Cohort studies
Respiratory infections:			
• Pneumonia	7	OR 1.58, CI 1.19-2.10	RR 1.61, CI 1.12-2.31
• Other respiratory infection	8	OR 1.38, CI 0.71-2.67	RR 1.35, CI 1.02-1.79
• Haemophilus influenza	6	OR 1.74, CI 1.27-2.37	
• Meningococcal disease	7	OR 2.13, CI 1.38-3.29	
• RSV / bronchiolitis	4	2.24, CI 1.14-4.38	
• TB	7	OR 3.78, CI 1.78-8.13	
Enteric infections:			
• Gastroenteritis	4	OR 1.13, CI 1.01-1.26	
• Hepatitis A	6	OR 1.42, CI 1.15-1.75	
• H. pylori	28	OR 1.82, CI 1.55-2.13	
Skin/eye infections:			
• Trachoma	2	OR 2.07, CI 1.06-4.06	
Total	79		

Source: Baker, McDonald et al. 2013.

Reducing ID Inequalities

Crowding reduction

HNZC Healthy Housing Programme (HHP)

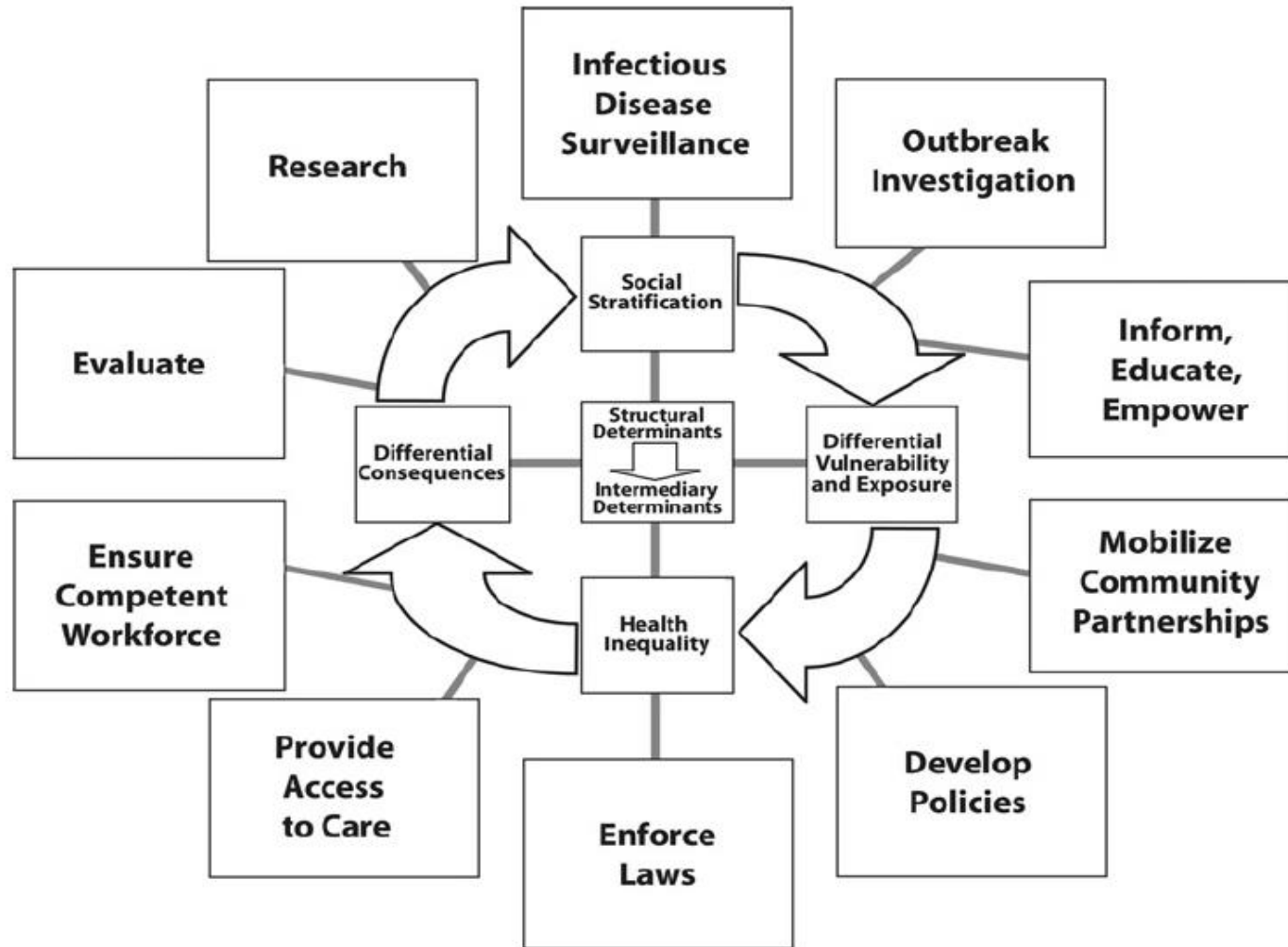
- Improves quality of rental housing & reduces household crowding
- Crowding reduction associated with 69% (95%CI- 91% to +1%) reduction in ID hospitalisations

Source: Baker et al. Health Impacts of the HHP on HNZC Tenants: 2004-2008



Reducing ID Inequalities

Intervention frameworks



Comprehensive approach to intervening on inequalities and infection. Source: Semenza & Giesecke. AJPH 2008; 98: 787-92.

Reducing ID Inequalities

Intervention frameworks

Global health security agenda (GHSA)

Global health security =

Collective health security

+

Individual health security from
access to safe health services,
products & technologies

⇒ Need to reduce inequalities at
international & individual levels

*Source: Heymann et al. Lancet
2015;385:1884-2015*

Summary	●
Prevent	●
Antimicrobial resistance	●
Zoonotic disease	●
Biosafety and biosecurity	●
Immunisation	●
Detect	●
National laboratory system	●
Surveillance for priority syndromes	●
Real-time reportable disease surveillance	●
Reporting	●
Workforce development	●
Respond	●
Emergency operations centres	●
Multisectoral response	●
Medical countermeasures/deployment	●

● No capacity

● Limited capacity

● Demonstrated capacity

Reducing ID Inequalities

Intervention frameworks



Reducing ID Inequalities

Intervention frameworks

1. **Social determinants** - Reducing income inequalities & deprivation
2. **Prevention** – Reducing inequalities in access to disease prevention programmes & services, eg uncrowded housing, vaccination
3. **Diagnosis & treatment** – Reducing inequalities in access to health care eg primary care
4. **Research & surveillance** - to track inequalities & identify the most cost-effective approaches to reducing them

Conclusion / Summary

- There are widespread inequalities (inequities) in both the distribution of social determinants (eg income poverty & deprivation) and IDs
- Both endemic & epidemic IDs are strongly associated with poverty & deprivation
- Preventing emerging IDs needs to include strategies to:
 1. reduce poverty & deprivation
 2. improve access to prevention programmes & services
 3. improve access to health care services
 4. surveillance of inequalities & research on the most cost-effective approaches to reducing them

Acknowledgements

- University of Otago / HEIRU Colleagues: Prof Nick Wilson, Prof Philippa Howden-Chapman, A/Prof Simon Hales, Dr Debbie Williamson, Dr Tim Blackmore, Dr Michelle Balm, Dr Ayesha Verrall, Dr Nicholas Jones, Jane Zhang
- Integrated Systems for Epidemic Response (ISER) colleagues: Prof Raina MacIntyre, Prof Archie Clements, A/Prof Martyn Kirk
- One Health Aotearoa colleagues: Prof Nigel French
- SMS colleagues: Peter Griffin
- ESR and Ministry of Health Colleagues
- Funders: Health Research Council of NZ, US CDC, NZ Ministry of Health, Stats NZ, Housing NZ
- UK sabbatical hosts (2015): Prof David Heymann, LSHTM, ECDC, NZ Link Foundation

