ASSET
KIDNEY RESEARCH
HE RAWA RARAUNGA HAUORA MŌ NGĀ TĀNGATA O AOTEAROA

AcceSS and Equity in Transplantation

Geographic variations in the epidemiology of kidney failure in New Zealand, 2006-2019

Johanna Birrell, Angela Webster, Nicholas Cross, Heather Dunckley, Ben Beaglehole, Ian Dittmer, John Irvine, Curtis Walker, Merryn Jones, Melanie Wyld, Kate Wyburn, Nicole De La Mata

Key findings:

1. The incidence of kidney failure and multimorbidity burden is highly variable across Aotearoa New Zealand

2. Living in a non-transplanting region was independently associated with disadvantage in accessing kidney transplantation

3. People of Māori or Pacific ethnicity were also independently disadvantaged in waitlisting and live donor transplantation.

Background:

- Transplantation is considered the ideal treatment for most people with kidney failure[1,2]
- However, health system organisation may create inequities in access to best care

- ANZSN Key Performance Indicator (KPI):
  - Proportion of patients aged ≥2 years and <65 years who are transplanted or “active” on the wait list **within 6 months** of starting kidney replacement therapy (KRT) [3]

- New Zealand (NZ) is currently undergoing major health reform.

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Aim:

To describe the epidemiology of kidney failure in New Zealand, and assess the impact of residential location on access to kidney transplantation.

Health services research

Methods

Data linkage flowchart

ANZDATA end-stage kidney disease incident patient cohort (New Zealand 2006-2019)

Study cohort (n=7,704)

Linkage to other datasets

National Minimum Dataset (admitted patient records, 2001-2019)

Domicile, coded hospital ICD-10-AM diagnoses

Calculation of Charlson Comorbidity Index & M3 Multimorbidity Index

ANZDATA Course of Treatment and Comorbidity Datasets (2006-2019)

Initial KRT modality, live donor transplantation dates, comorbidity data

New Zealand Blood Service waitlisting data (2006-2019)

Date of deceased donor waitlisting

Domicile mapping files

1. District Health Board jurisdictions

2. New Zealand Index of Deprivation

3. Rural-urban Geographic Classification for Health (GCH)

Results

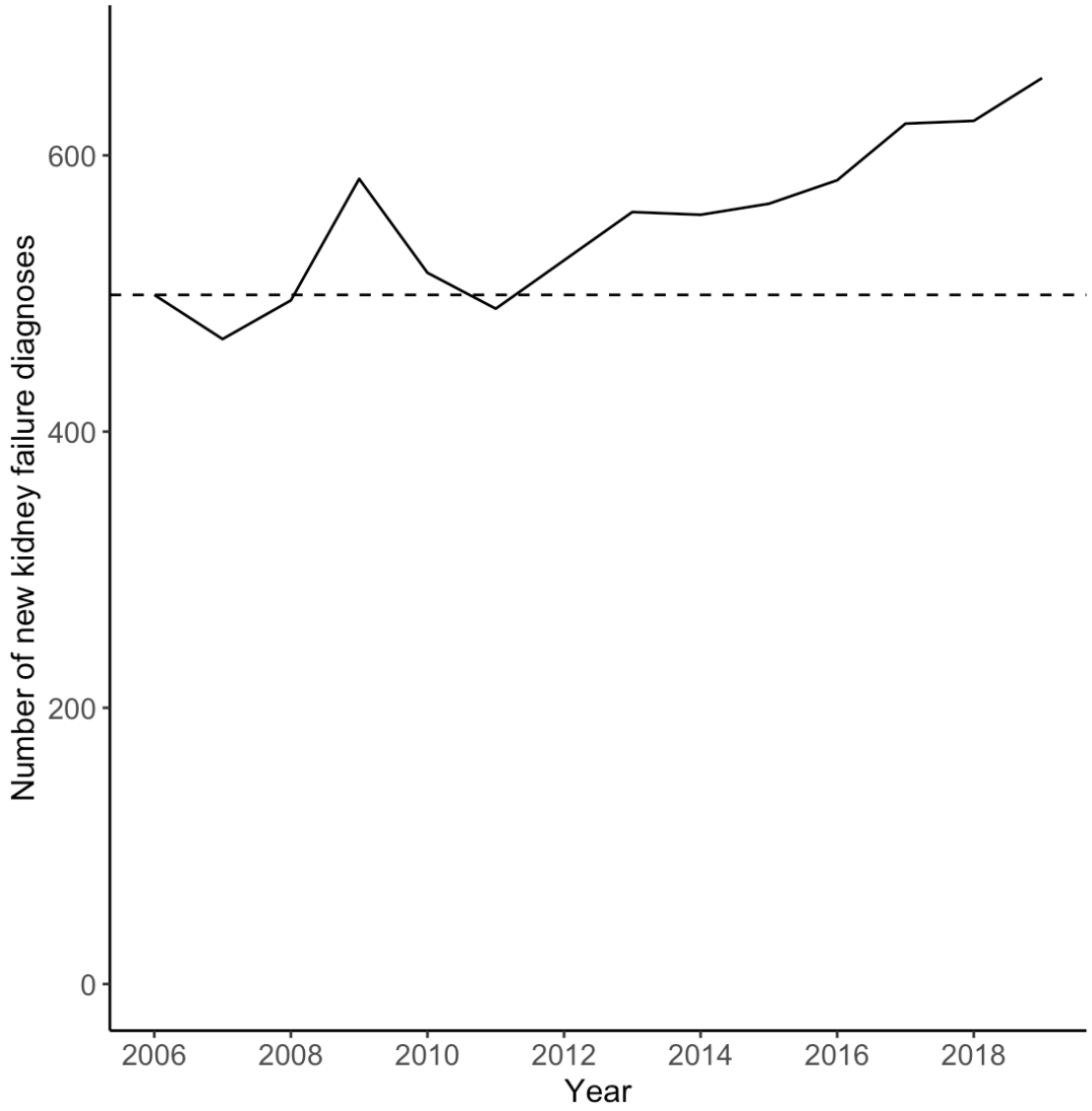
Cohort characteristics

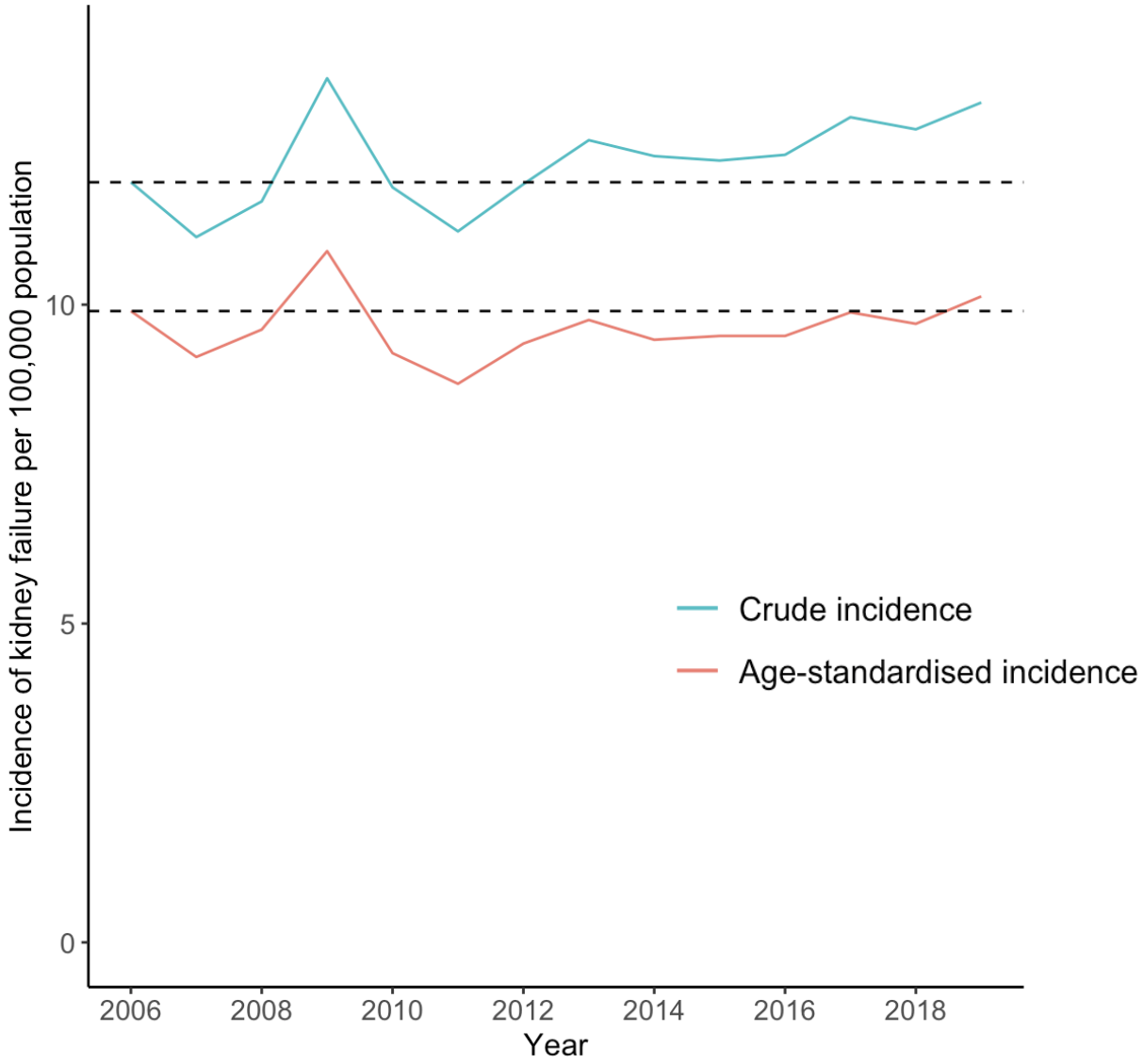
Total number of people starting KRT in NZ, 2006-2019	7,704
Age at KRT start, median (IQR)	58 years (48-68)
Sex	
Male	4,633 (60%)
Female	3,071 (40%)
Ethnicity	
European	2,975 (39%)
Māori	2,380 (31%)
Pacific	1,605 (21%)
Asian	640 (8%)
Other ethnicity	74 (1%)
Rurality (GCH code)	
Urban (U1, U2)	6,271 (81%)
Rural (R1, R2, R3)	1,402 (18%)

Key findings:

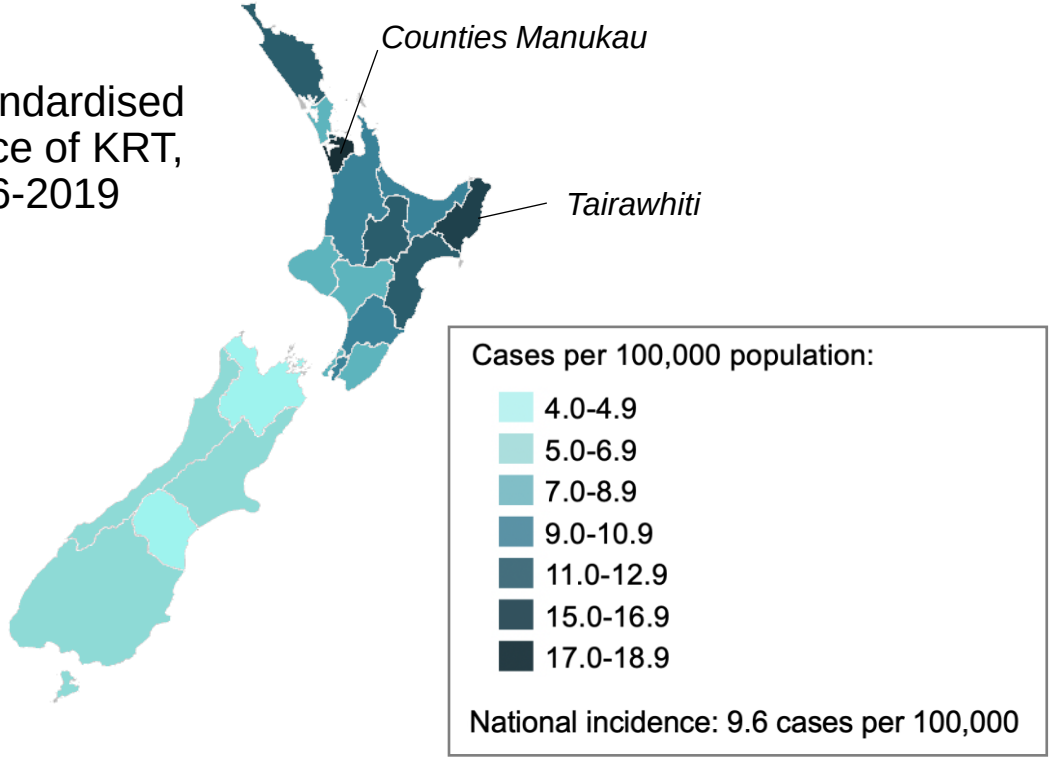
1. The incidence of kidney failure and multimorbidity burden is highly variable across Aotearoa New Zealand

Trends in incidence of KRT in New Zealand, 2006-2019





Age-standardised incidence of KRT, 2006-2019



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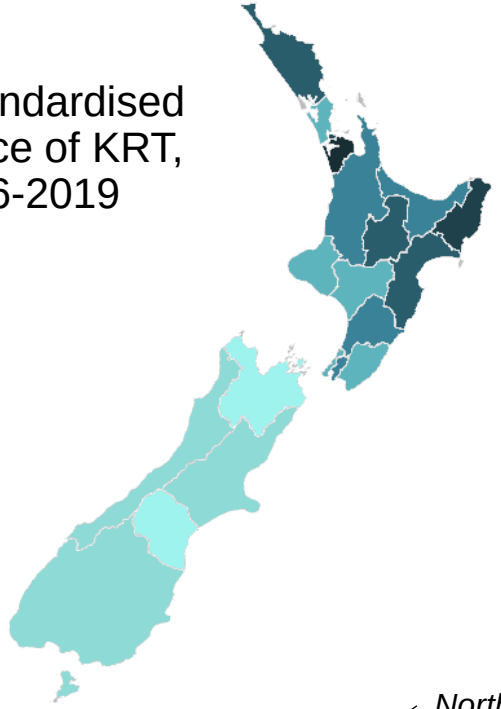
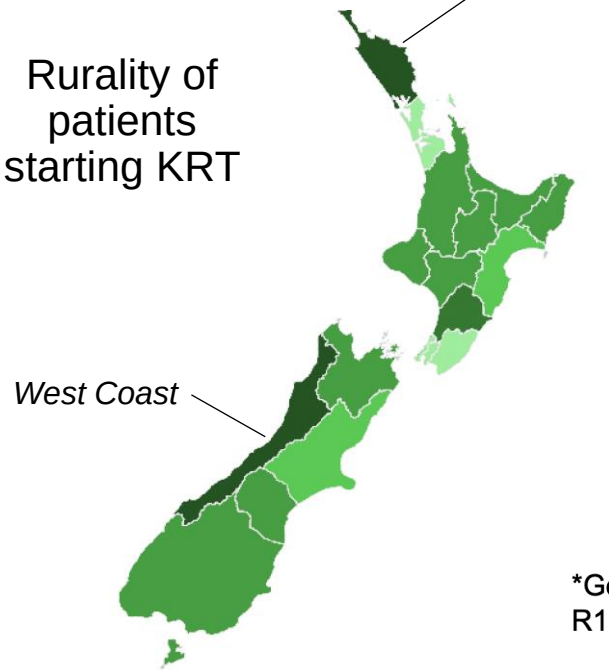


Rurality of patients starting KRT

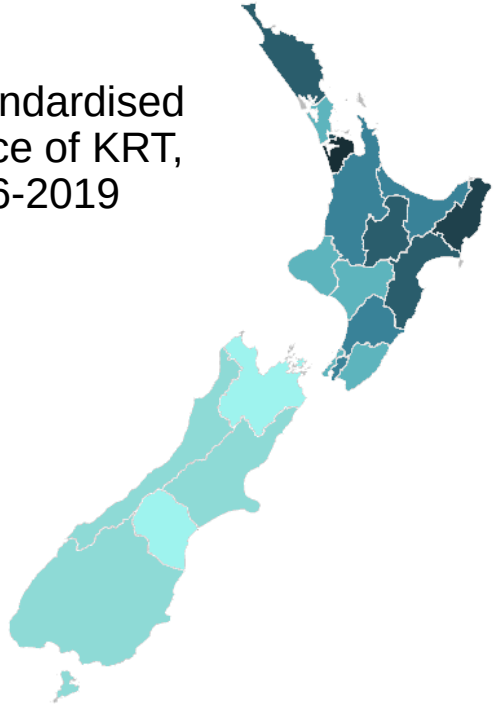


% of patients with a rural address*:

- ≤9%
- 10-19%
- 20-39%
- 40-59%
- ≥60%

*Geographic Classification for Health R1-R3 area, based on domicile

Age-standardised incidence of KRT, 2006-2019



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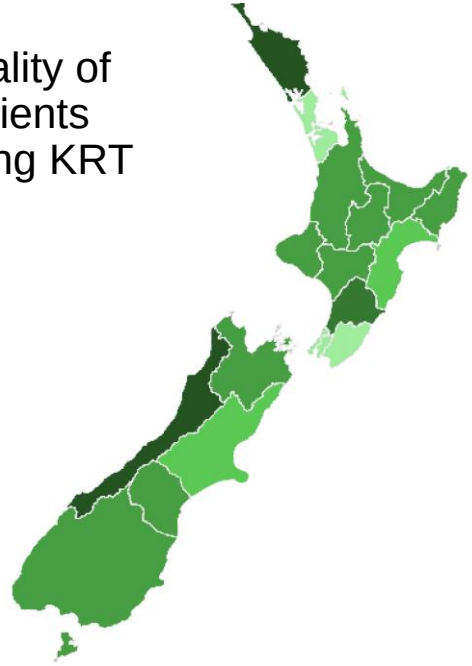
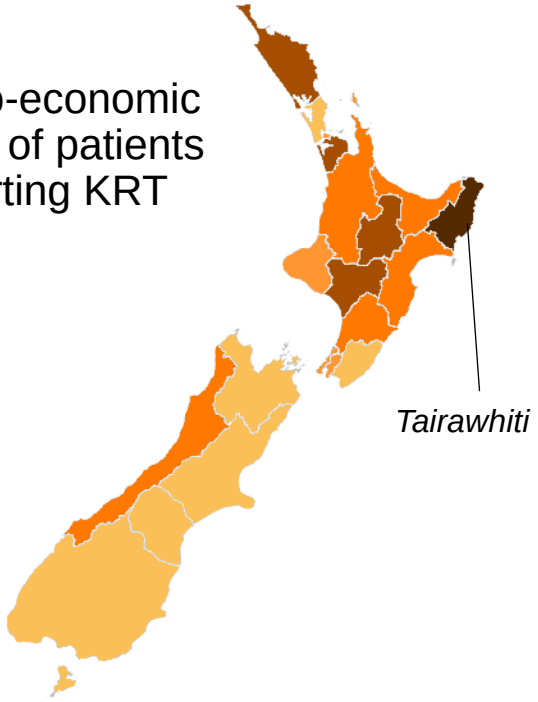


Socio-economic index of patients starting KRT

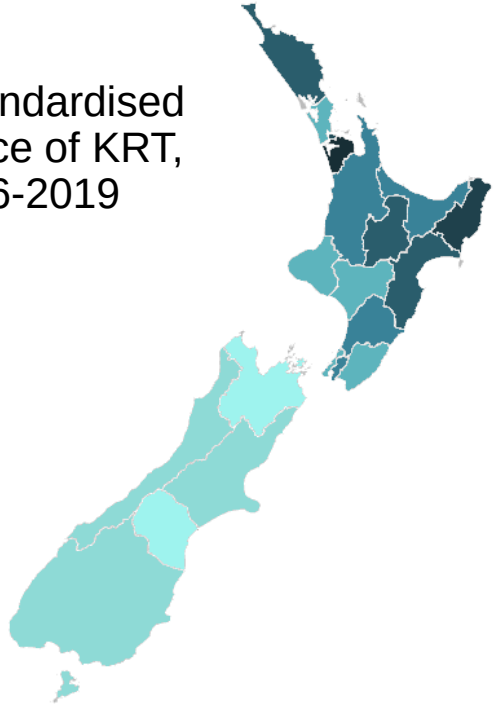


% of patients living in the most disadvantaged socioeconomic quintile*:

- ≤19%
- 20-39%
- 40-59%
- 60-79%
- ≥80%

*NZDep index of 9-10

Age-standardised incidence of KRT, 2006-2019



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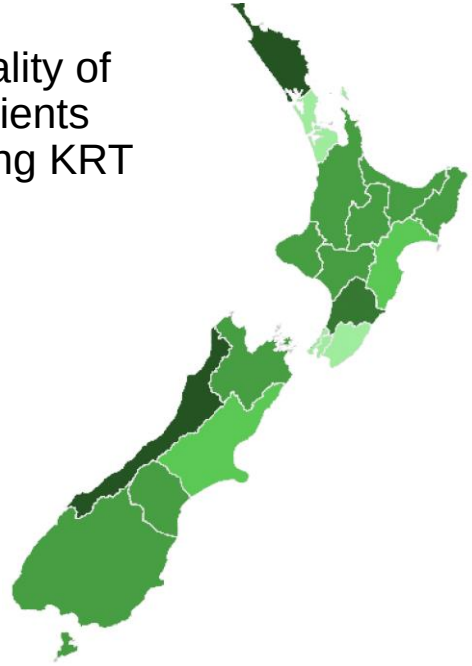

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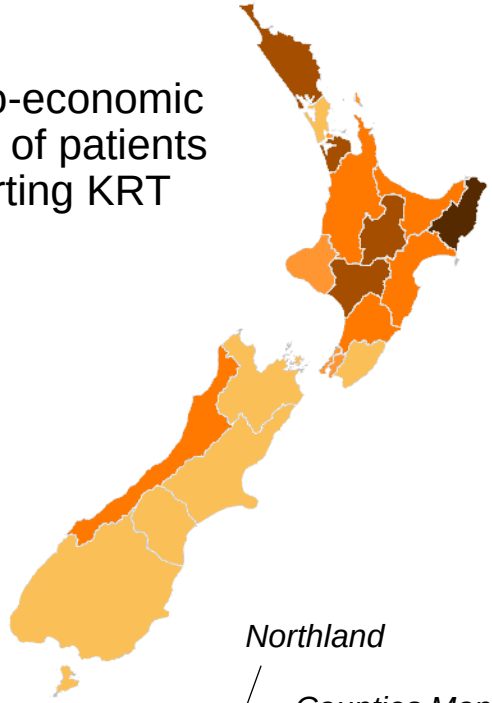
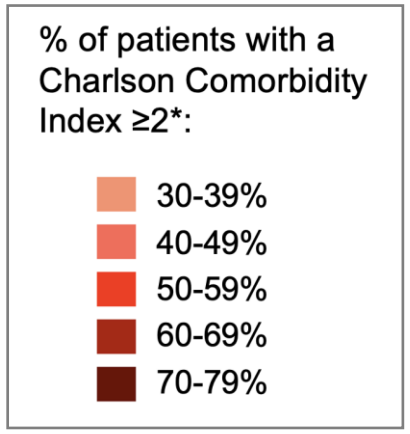
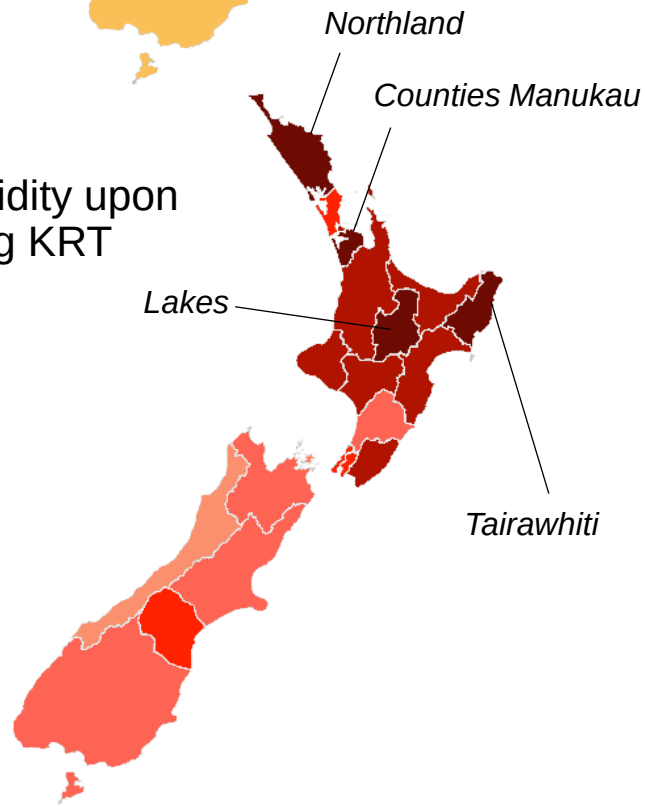


Multimorbidity upon starting KRT



*Estimated 10-year survival ≤ 53%



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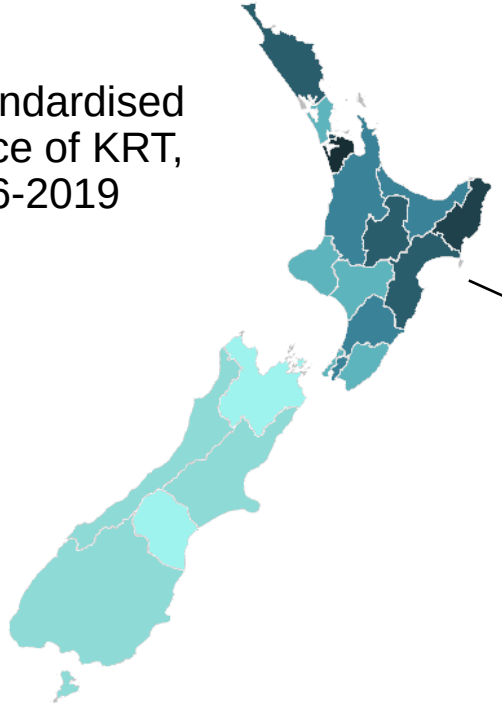

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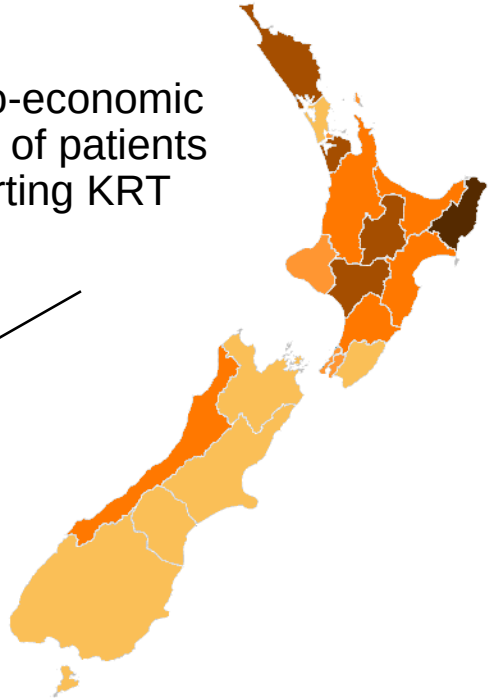

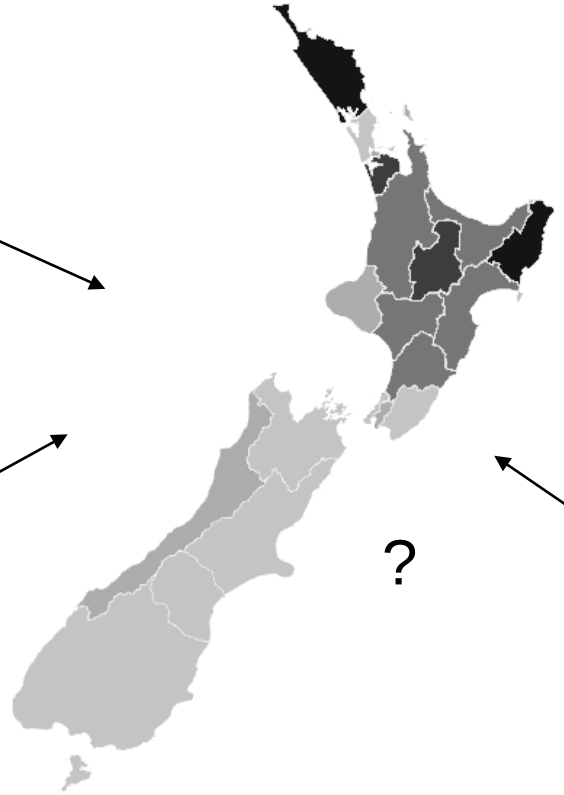

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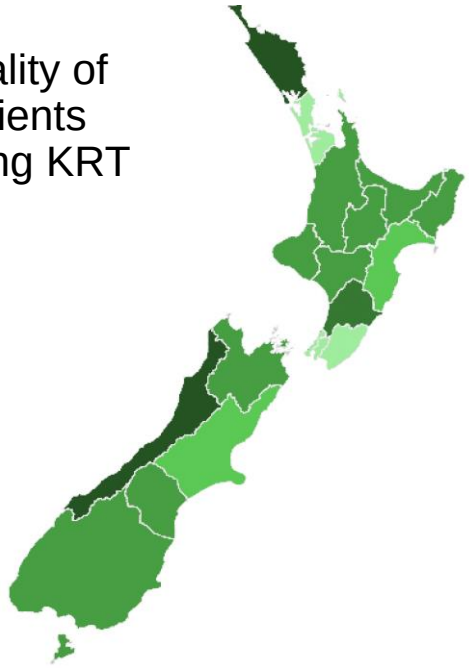

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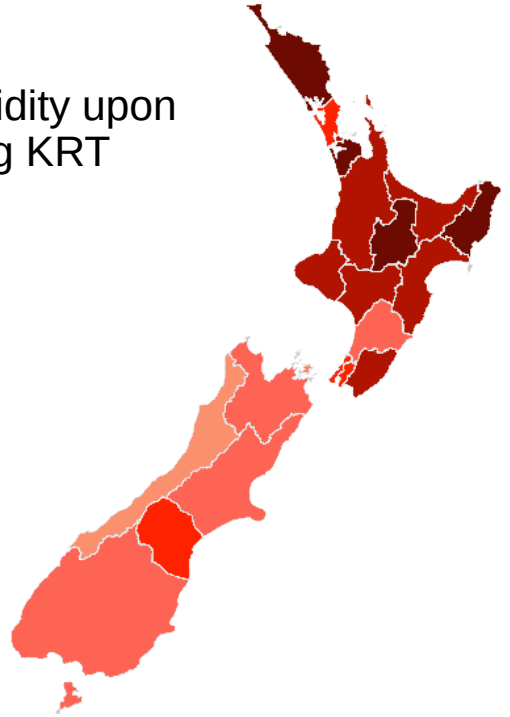
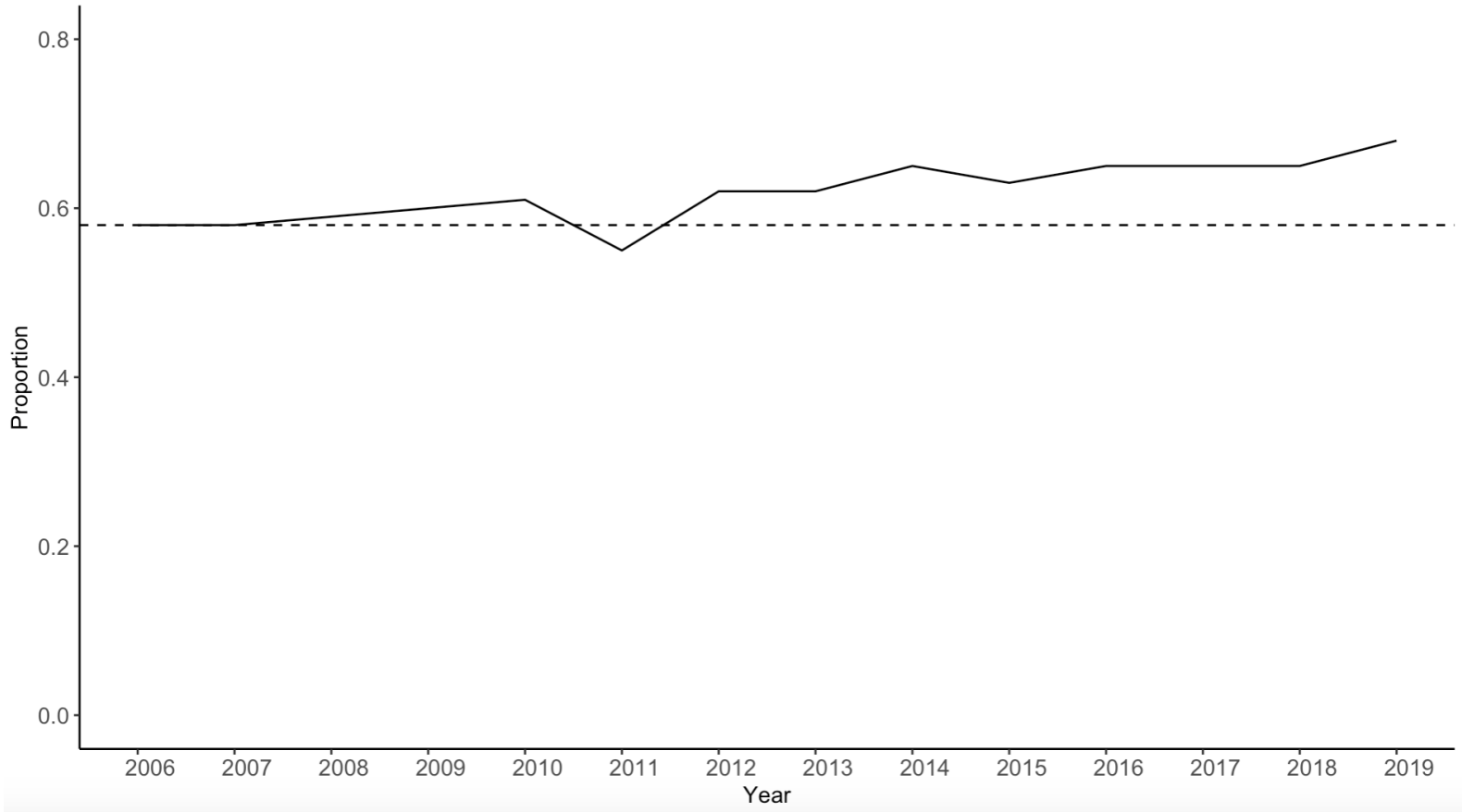


Proportion of people starting KRT with Charlson Comorbidity Index ≥2*: trend over study period (2006-2019)



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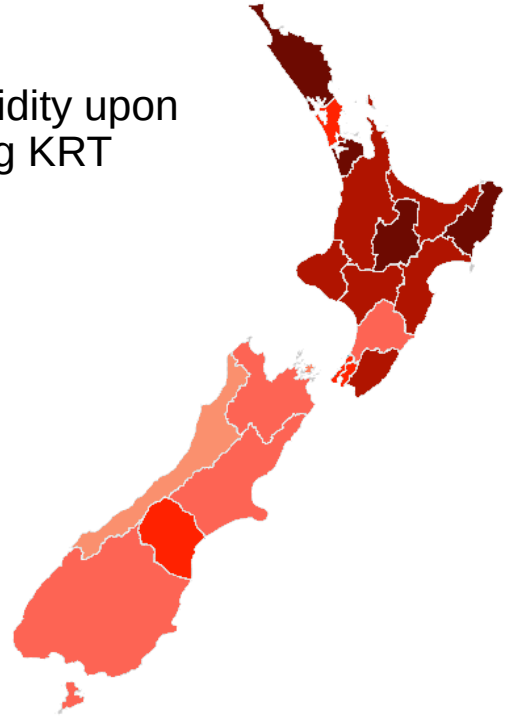

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Key findings:

2. Living in a non-transplanting region was independently associated with disadvantage in accessing kidney transplantation

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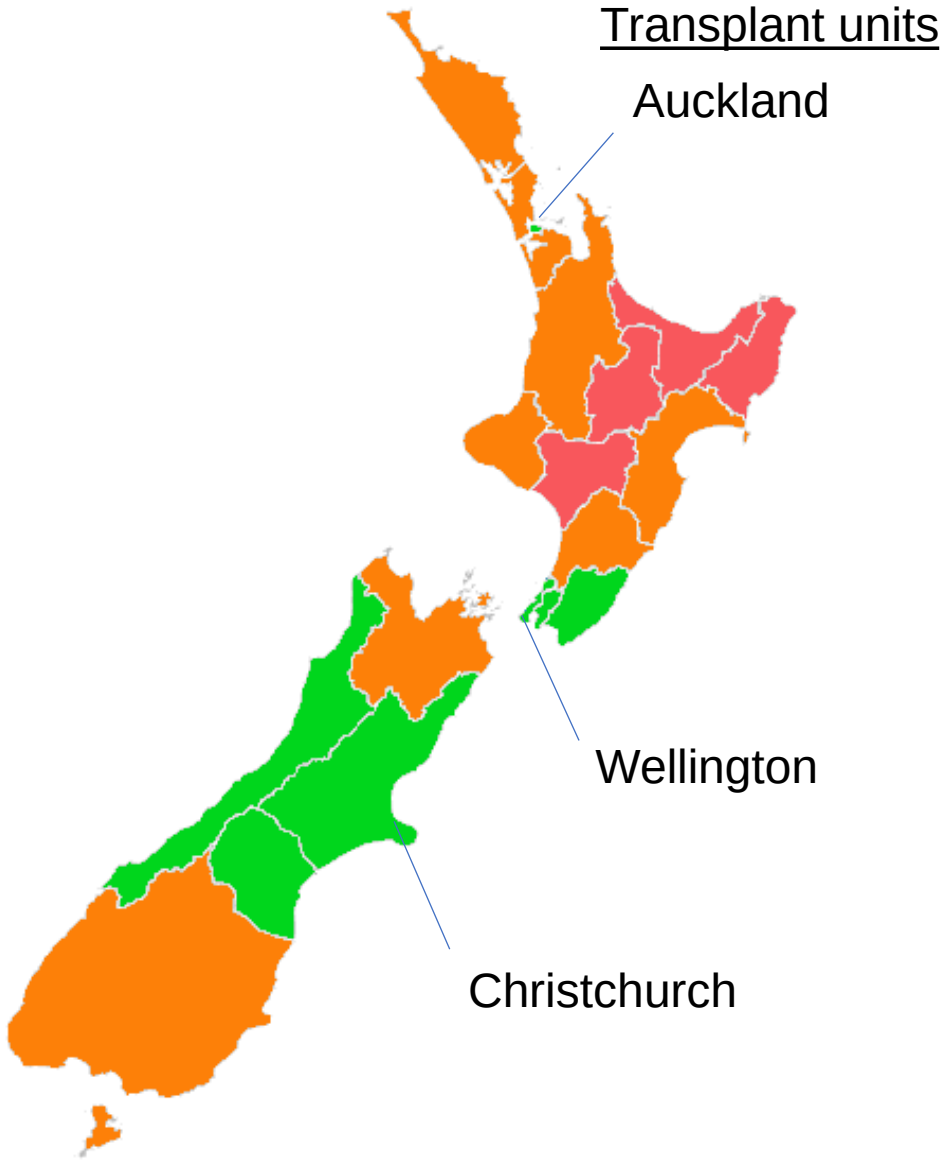
Region categories

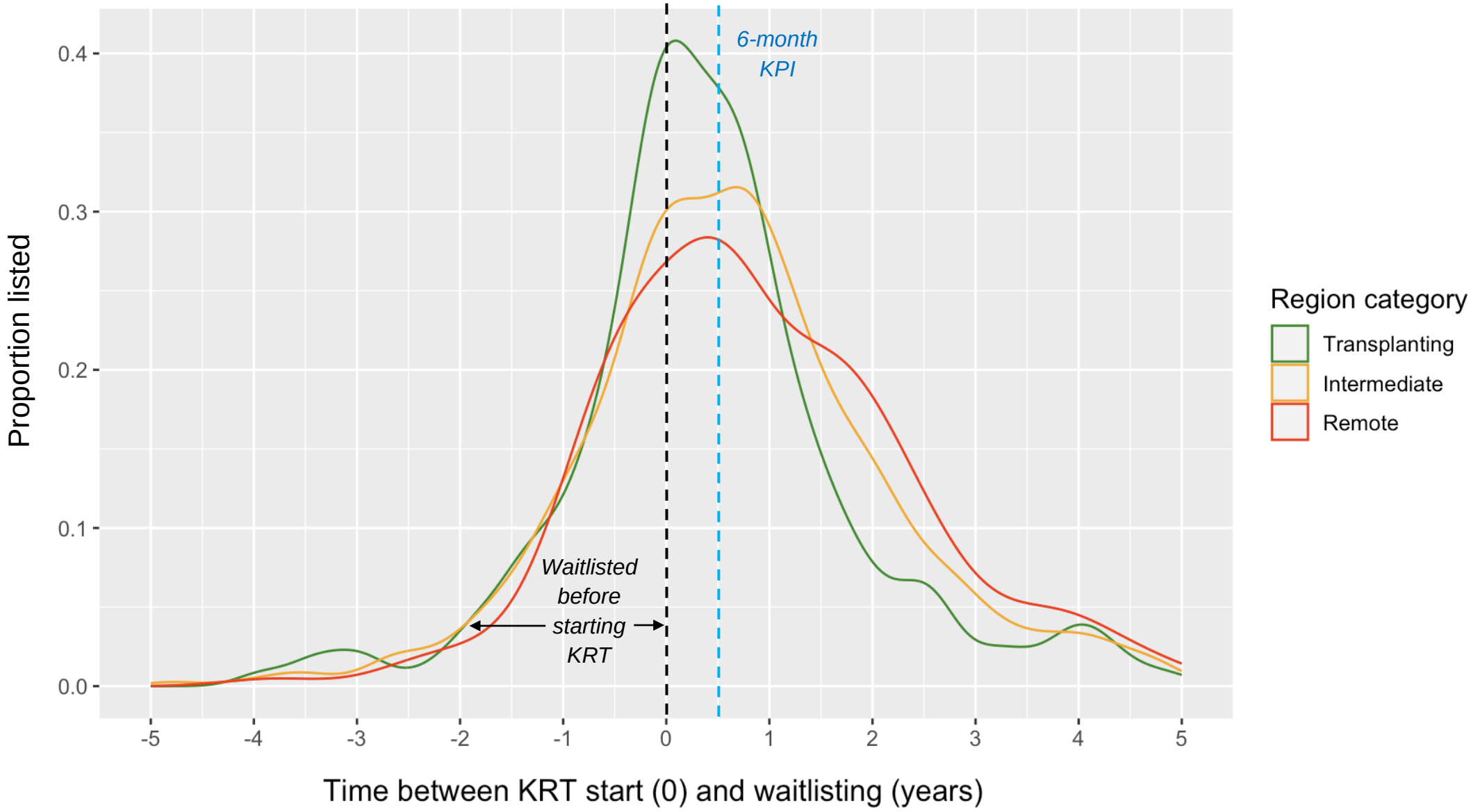
‘*Transplanting regions*’ = District Health Boards (DHBs) containing a transplant unit, or adjacent to and staffed by a transplanting DHB throughout the study period.

‘*Intermediate regions*’ = DHBs with on-site nephrologists that refer patients directly to a transplant unit or received visiting transplant unit staff.

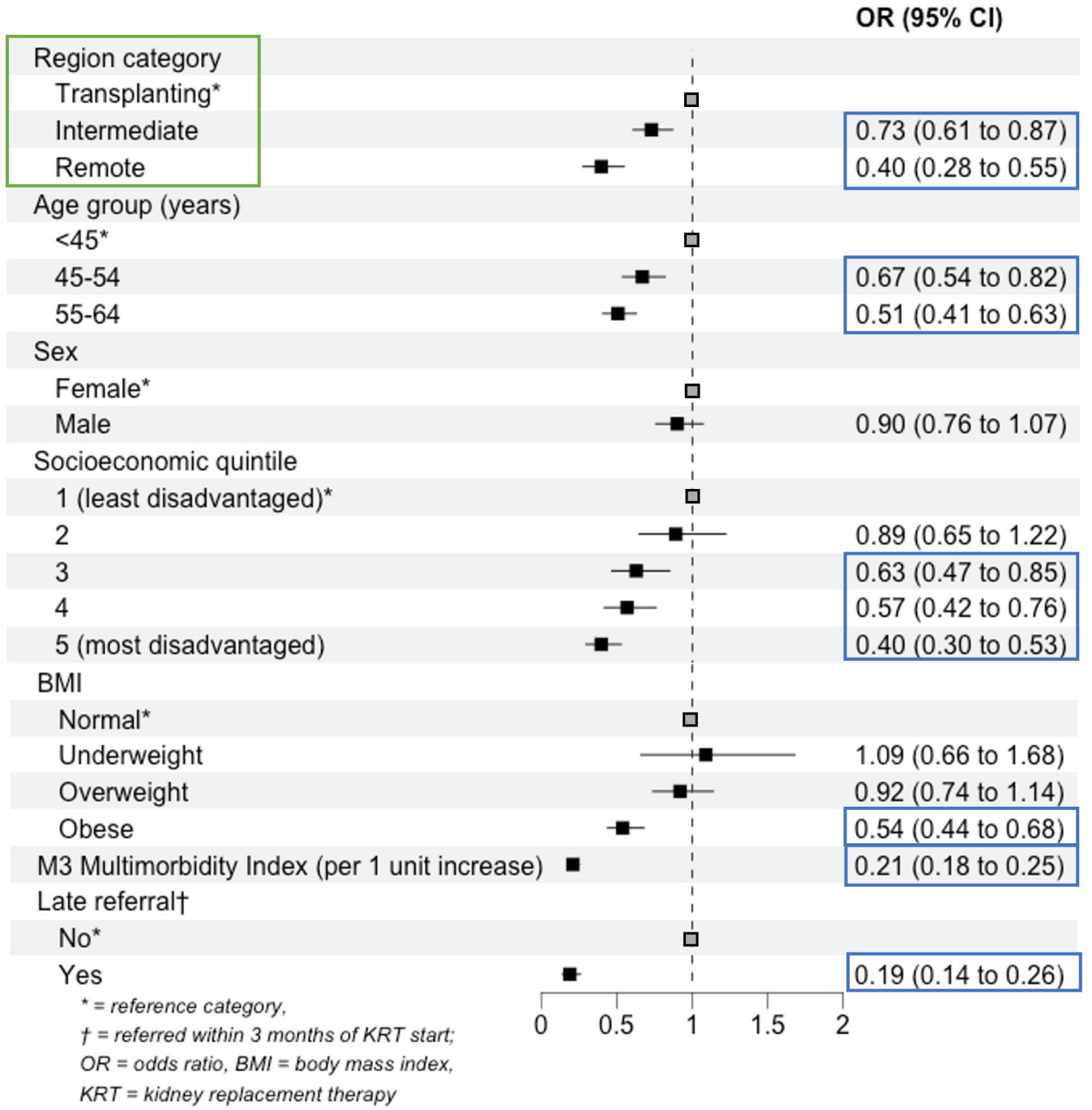
‘*Remote regions*’ = DHBs in which patients require referral to another DHB for nephrology review, followed by a second referral to a transplant unit.



Time between starting KRT and waitlisting (years), by region category in NZ, 2016-2019



Multiple logistic regression analysis: waitlisting or live donor transplantation by **6 months** after starting KRT



Note: ethnicity was also included in this model

Key findings:

3. People of Māori or Pacific ethnicity were also independently disadvantaged in waitlisting and live donor transplantation

Multiple logistic regression analysis: **ethnicity comparison**

Outcomes:
Waitlisting / live donor transplantation by **6 months** after starting KRT

Adjusted for:

- Region category (transplanting / intermediate / remote)
- Age
- Sex
- Socioeconomic quintile
- Body mass index
- M3 Multimorbidity Score
- Late referral

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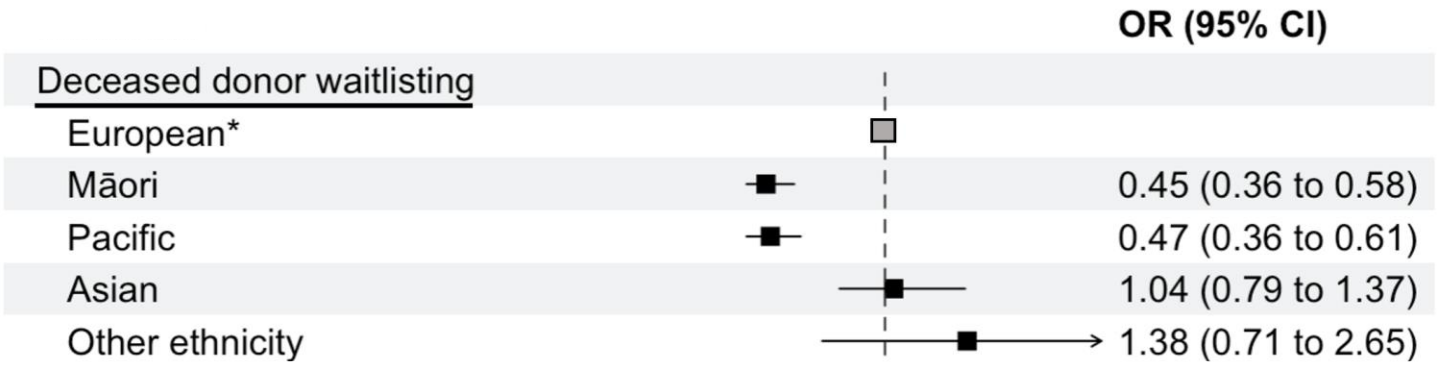

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** = reference category;*
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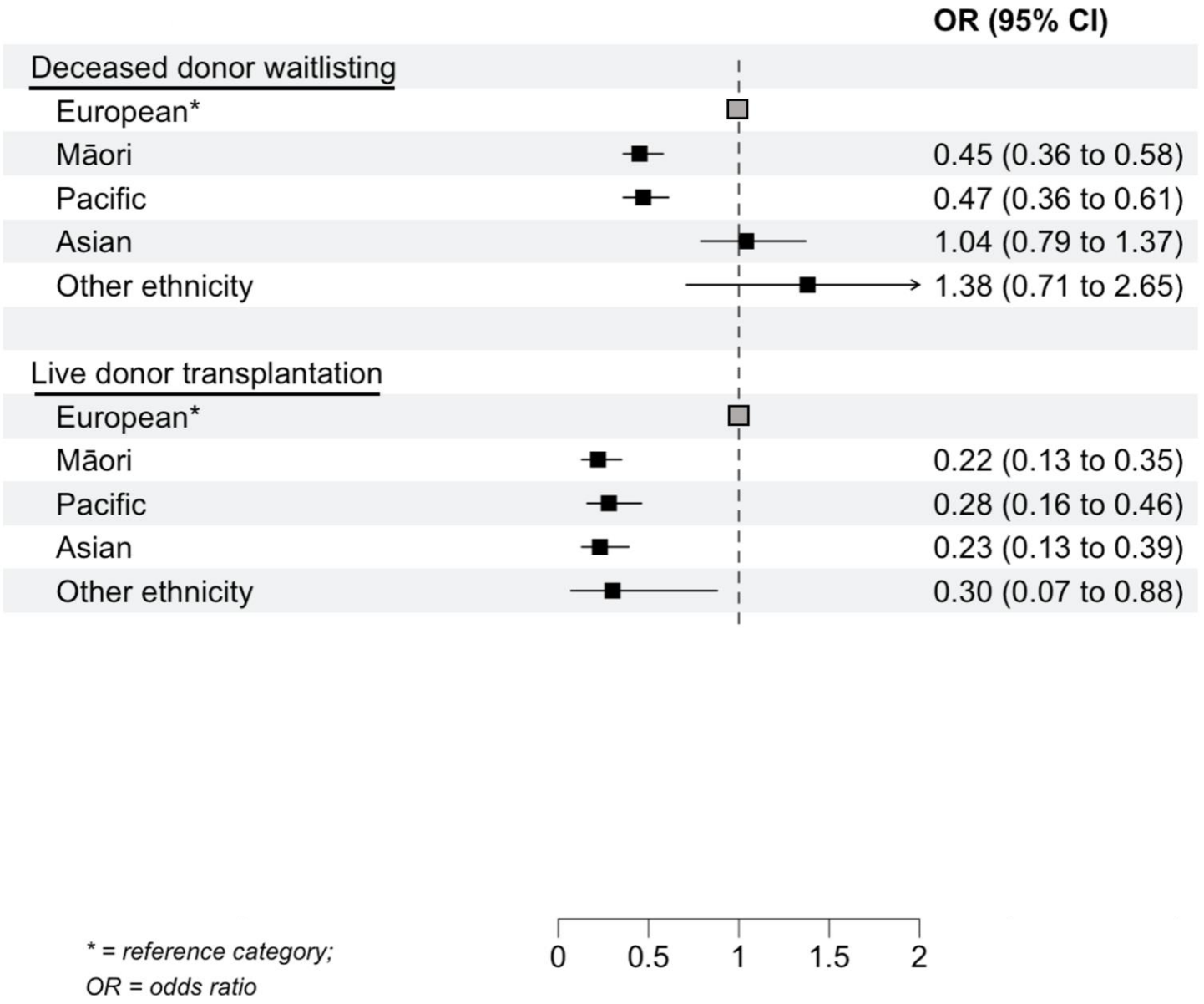

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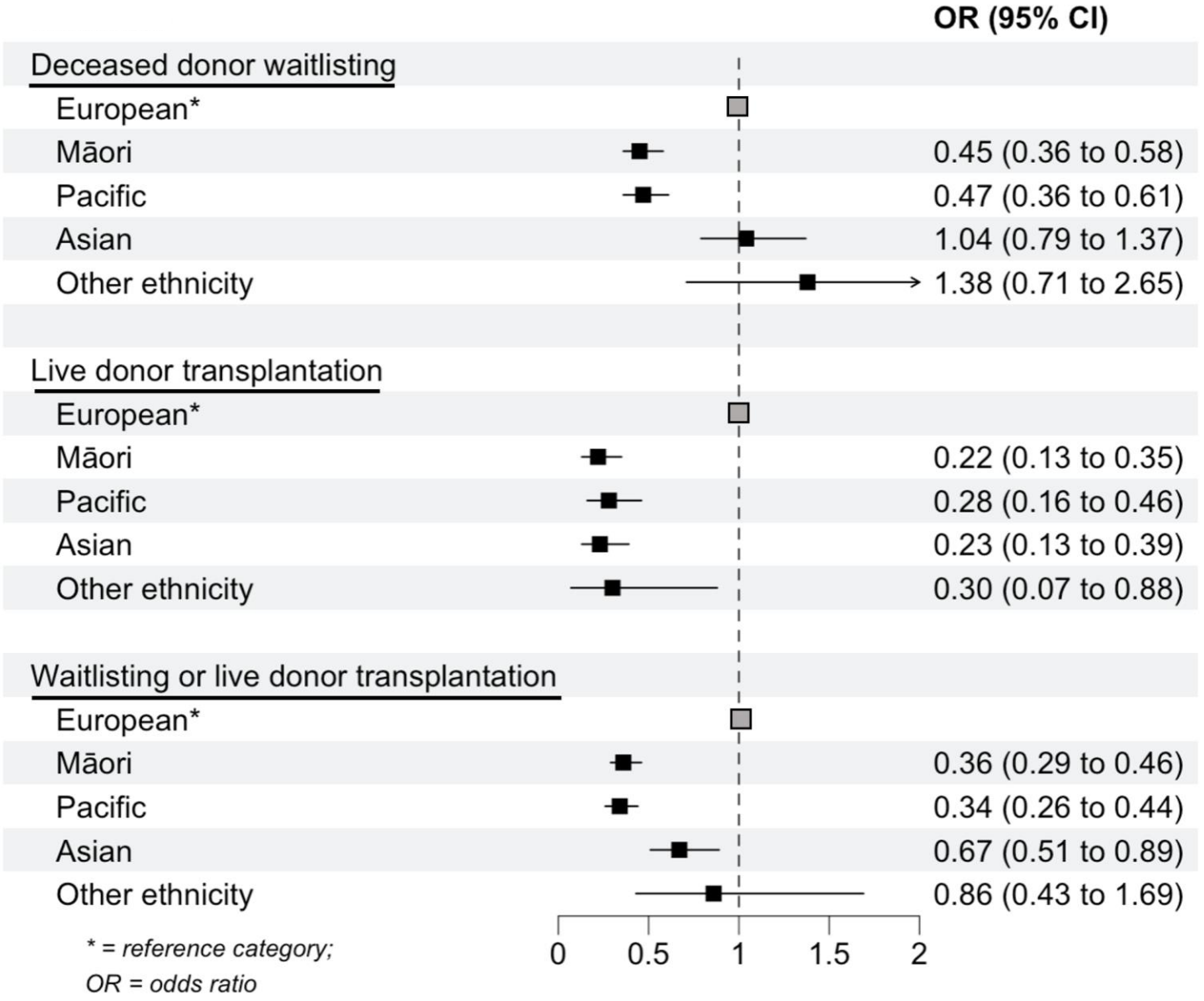

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References:

1. Wong G, Howard K, Chapman JR, Chadban S, Cross N, Tong A, et al. Comparative survival and economic benefits of deceased donor kidney transplantation and dialysis in people with varying ages and co-morbidities. PLoS One. 2012; 7(1):e29591.

2. Tonelli M, Wiebe N, Knoll G, Bello A, Browne S, Jadhav D, et al. Systematic Review: Kidney Transplantation Compared With Dialysis in Clinically Relevant Outcomes. American Journal of Transplantation. 2011; 11(10):2093–109.

3. ANZSN Key Performance Indicator (KPI) Working Group. A Nephrology KPI Program for Australia and Aotearoa New Zealand - Report of the Key Performance Indicator Working Group. Nov 2020. Available at: https://nephrology.edu.au/int/anzsn/uploads/Reports/KPIWG%20Communicque%20-%2018%20November%202020.pdf

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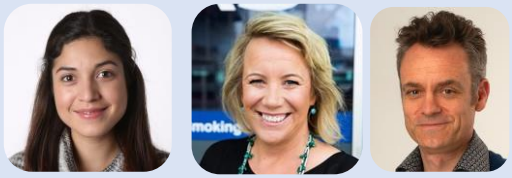
Acknowledgements:

- **Research supervisors**: Dr Nicole De La Mata, Prof Angela Webster, Dr Nick Cross



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- Mr James Hedley, University of Sydney (adapted Charlson Comorbidity Index R Code)
- University of Otago – Rural-urban classification for NZ health research and policy

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Thank you

Website:

https://assetkidneyresearch.org

Email:

info@assetkidneyresearch.org

Questions