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Using home care assessment measures of older people to identify risk and improve service provision

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Te Rūnanga Tātari Tatauranga
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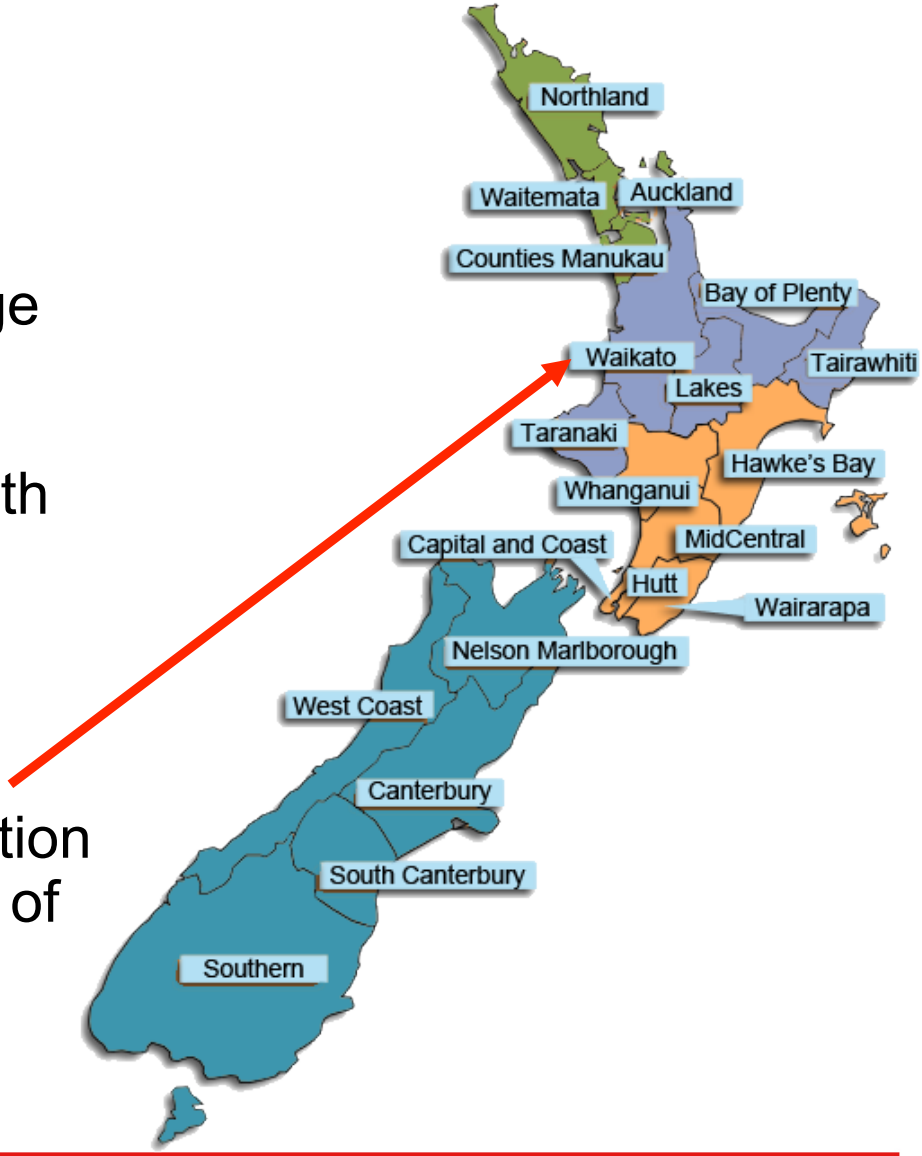
Institute of Healthy Ageing
Rehabilitation, Ageing and Clinical Studies
Waikato District Health Board

Outline

- In this seminar, I will:
  - Introduce the InterRAI home care assessment instrument;
  - Describe how we used the data from the home care assessments to create models of hospital admissions (for any reason), number of bed days, dementia admissions, and mortality; and
  - Discuss how these results are being applied by the Waikato District Health Board to improve services for older people in the community

The context

- New Zealand has 20 District Health Boards (DHBs). Each DHB is government funded (based on total population, age distribution, socio-economic status, and ethnic mix) and is responsible for providing health and disability services in their region, including services for older people
- Waikato DHB, in the central North Island, covers a population of around 400,000 (about 9% of the national population)



Ageing New Zealand

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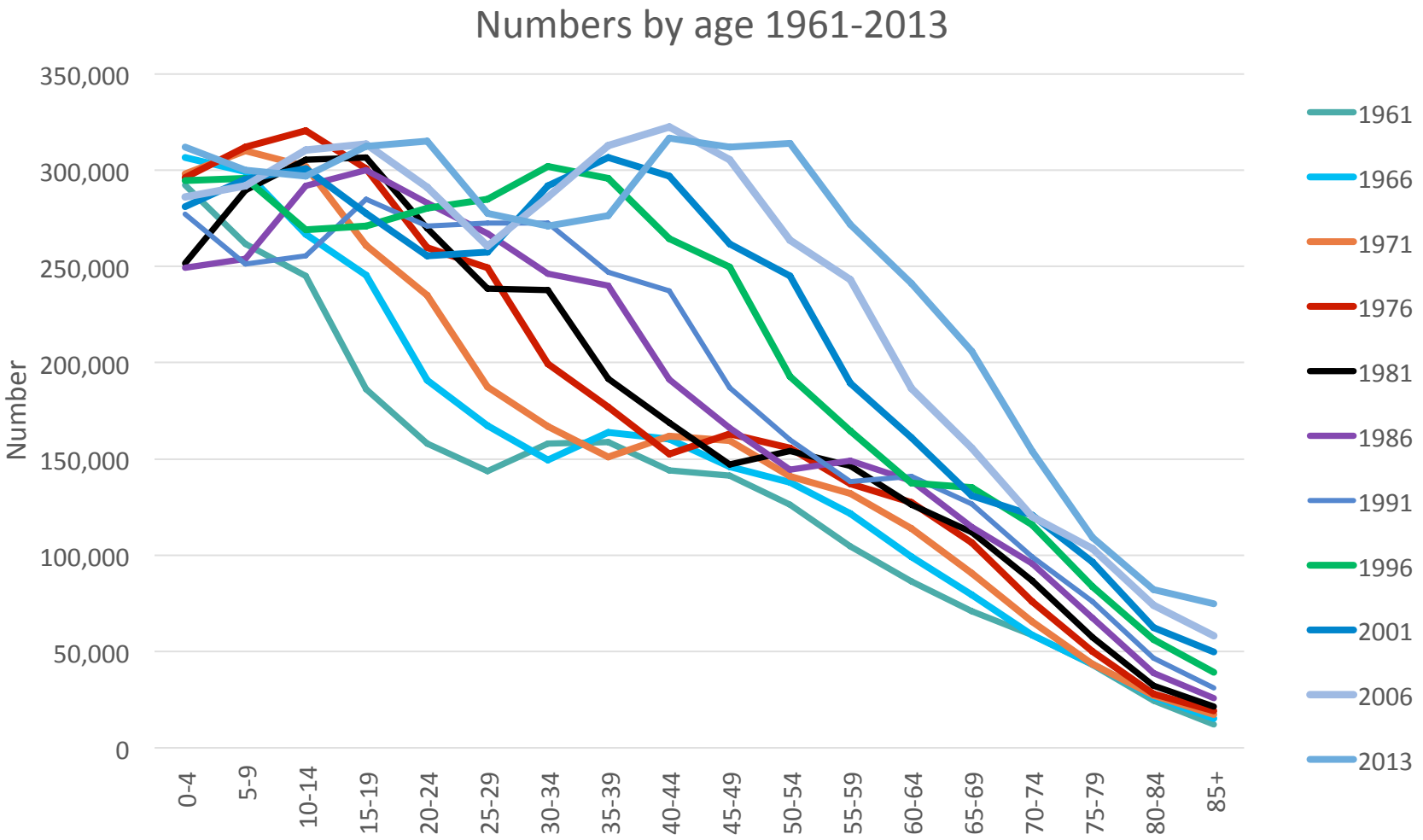

Source: Statistics New Zealand, Estimated Resident Population by age and sex

Ageing New Zealand

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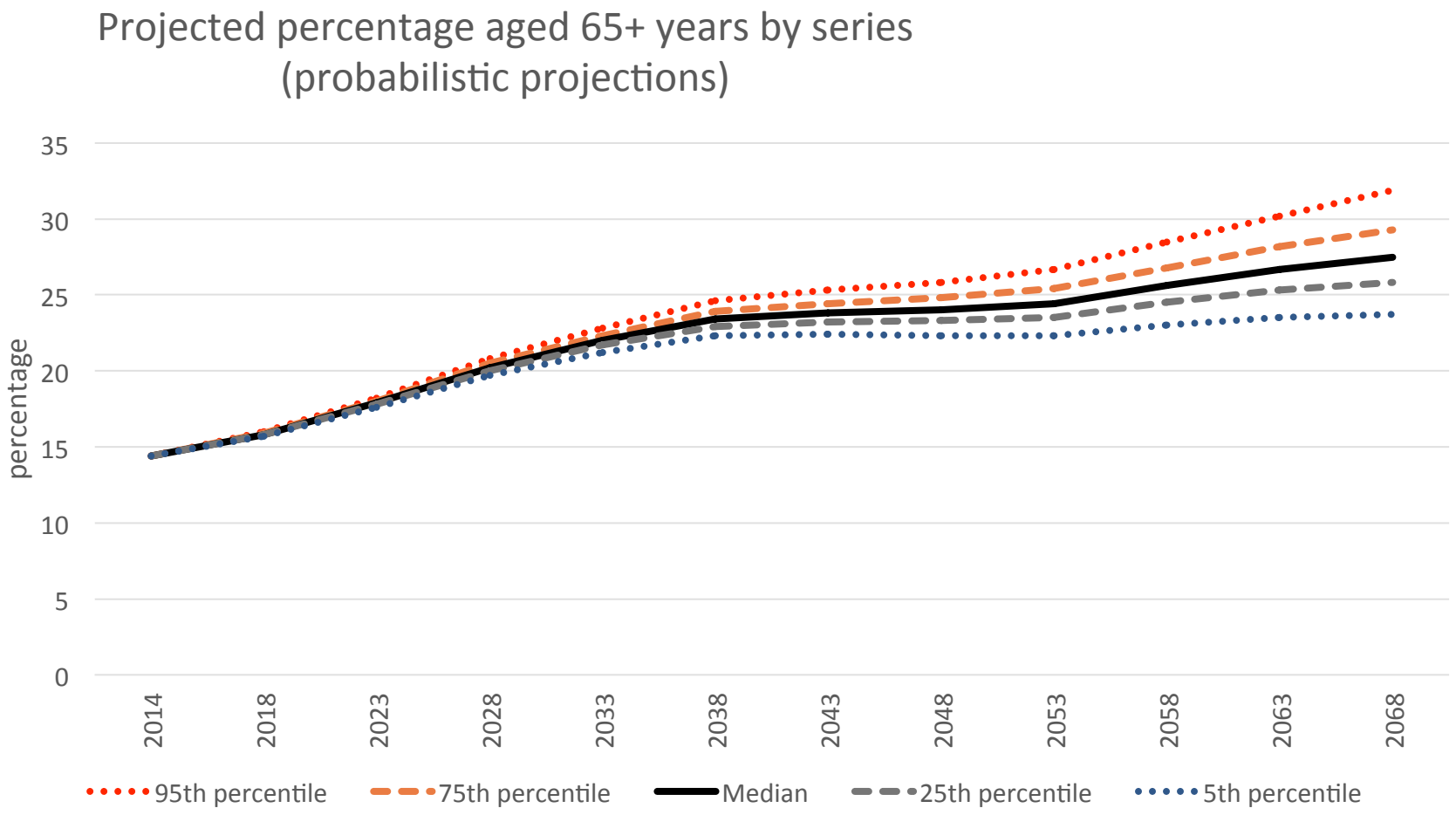

Source: Statistics New Zealand (2015) National population projections, 2014(base)-2068

What is InterRAI?

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- The International Resident Assessment Instrument (InterRAI) is a comprehensive assessment tool for older people
- Originated in Canada. Used as the de facto tool in over 30 countries
- Electronic and mandated by the Ministry of Health in New Zealand
- The Contact Assessment and Home Care Assessment are the tools used to assess needs of older people requiring long-term disability support
  - I make use of the Home Care Assessment data in this seminar
- In the Waikato DHB area, Disability Support Link (DSL) undertake 3,500 unique assessments of older people living in their own homes per year. Each assessment takes 1.5 hours to complete
- Time from referral to assessment is 2, 5, 10 or 15 days, depending on urgency and complexity (MOH guidelines)

InterRAI components

- InterRAI includes multiple outcome tools (e.g. IADL, ADL, Depression, Cognitive Function) as well as multiple other items (over 400 in total), but we focussed on the following:
  - **ADL** (Activities of Daily Living) hierarchy groups activities of daily living according to the stage of the disablement process in which they occur. The ADL Hierarchy ranges from 0 (no impairment) to 6 (total dependence)
  - **CHESS** (The Changes in Health, End-stage Disease, Signs, and Symptoms) scale identifies individuals at risk of serious decline. CHESS is a 6-point scale from 0 (stable) to 5 (unstable).
  - **MAPLe** (Method of Assigning Priority Levels) differentiates people into five priority levels, based on their risk of adverse outcomes. MAPLe ranges from 1 (low priority) to 5 (high priority).
  - **CAPs** (Clinical Assessment Protocols) are 30 measures that inform the care planning function. Each CAP (such as functional decline) is linked by an algorithm to key items within the assessment

InterRAI descriptive outputs

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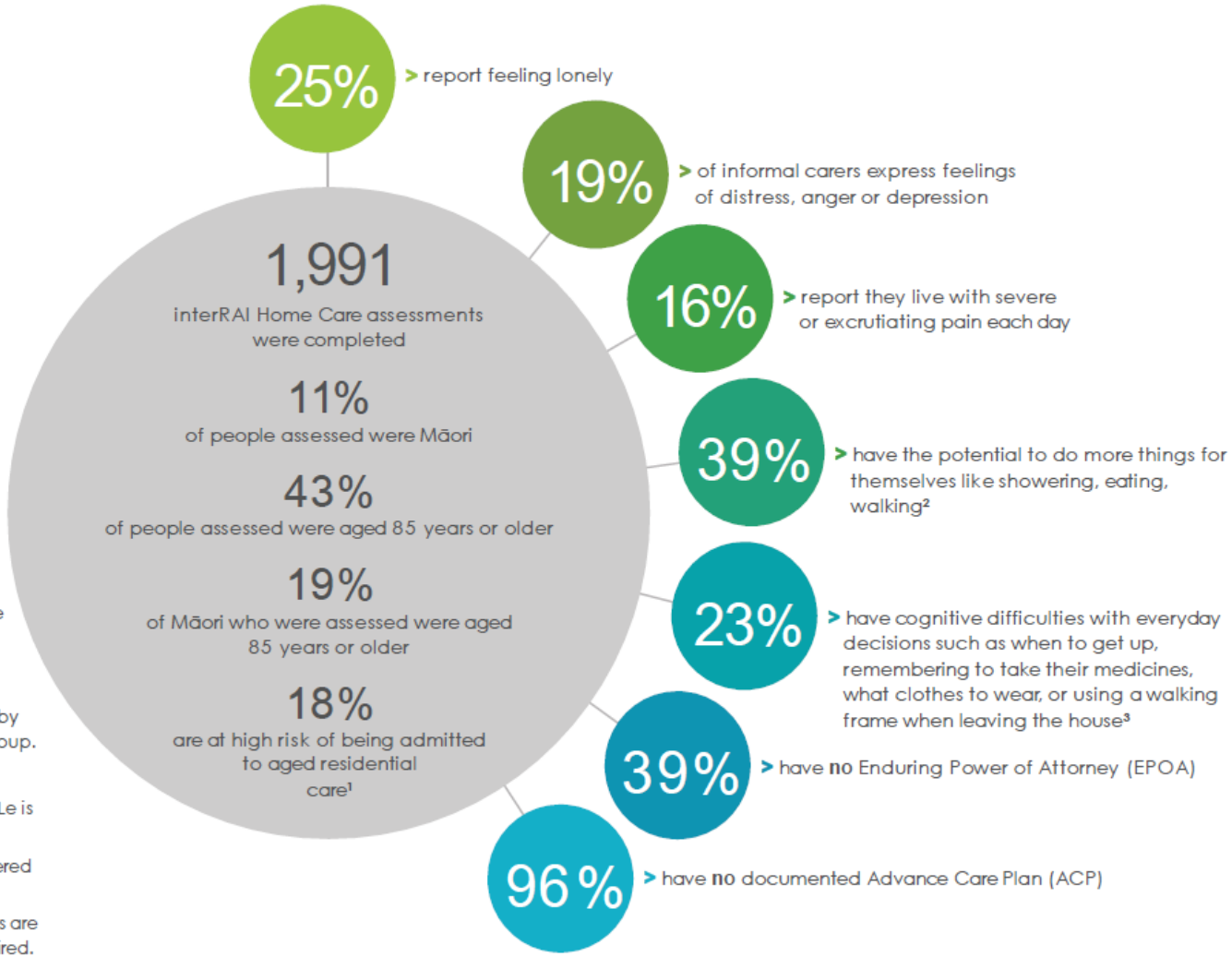
One of the ways DHBs help older people living in the community get the right assistance at the right time, is to have a health professional complete an assessment of their health and wellbeing. This is known as an interRAI Home Care assessment.

By publishing these interRAI Home Care assessment figures we want to raise awareness of the needs of our older people, and encourage health professionals, community groups, and family/whānau to check in with older people and see how they are doing.



Notes:

- The data represents only those older people who have had an interRAI Home Care assessment during Q3 of 2016/17 for the Midland Region DHBs.
- The infographic design was commissioned by the Central Region DHBs' Benchmarking group.

Footnotes:

1. MAPLe value is (5) Very high priority. MAPLe is an algorithm that assigns a priority level.
2. The Activities of Daily Living (ADL) CAP is triggered at level 1 or 2.
3. Cognitive skills for daily decision making values are (3) Moderately impaired, or (4) Severely impaired.

Going beyond descriptive statistics...

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- In this project, we wanted to make more use of the wealth of information contained within the InterRAI data
- Specifically, we aimed to identify mechanisms to better predict risk of entry to hospital (and other outcomes)
- This would then support a streamlined approach to initiate mechanisms to reduce risk of hospitalisation

Data

- We received data from the Waikato DHB for all interRAI home care assessments from January 2013 to June 2016 in the Waikato area, which included 11,142 unique assessments
  - Restricting the sample to those aged over 50 and removing those with incomplete data leaves 11,104 assessments in the sample
- The assessment data were linked to other routinely-collected health care data from Waikato DHB over the 90-day period following the assessment:
  - Number of hospitalisations
  - Number of bed days (for hospitalisations)
  - Dementia admissions
  - Mortality
- The unit of observation is the assessment
  - So, some patients appear in the dataset multiple times, but others just once

Methods

- We applied logistic regression models for:
  - Ever hospitalised (within 90 days of assessment)
  - Ever admitted for dementia (within 90 days of assessment)
  - Mortality (within 90 days of assessment)
- And Poisson regression models for:
  - Number of hospital admissions (within 90 days of assessment)
  - Number of bed days (for hospitalisations that started within 90 days of assessment)
- All models controlled for gender, Māori ethnicity (vs. non-Māori), age (at the time of the assessment) and age-squared (to pick up any non-linear effects of age)

Descriptive statistics

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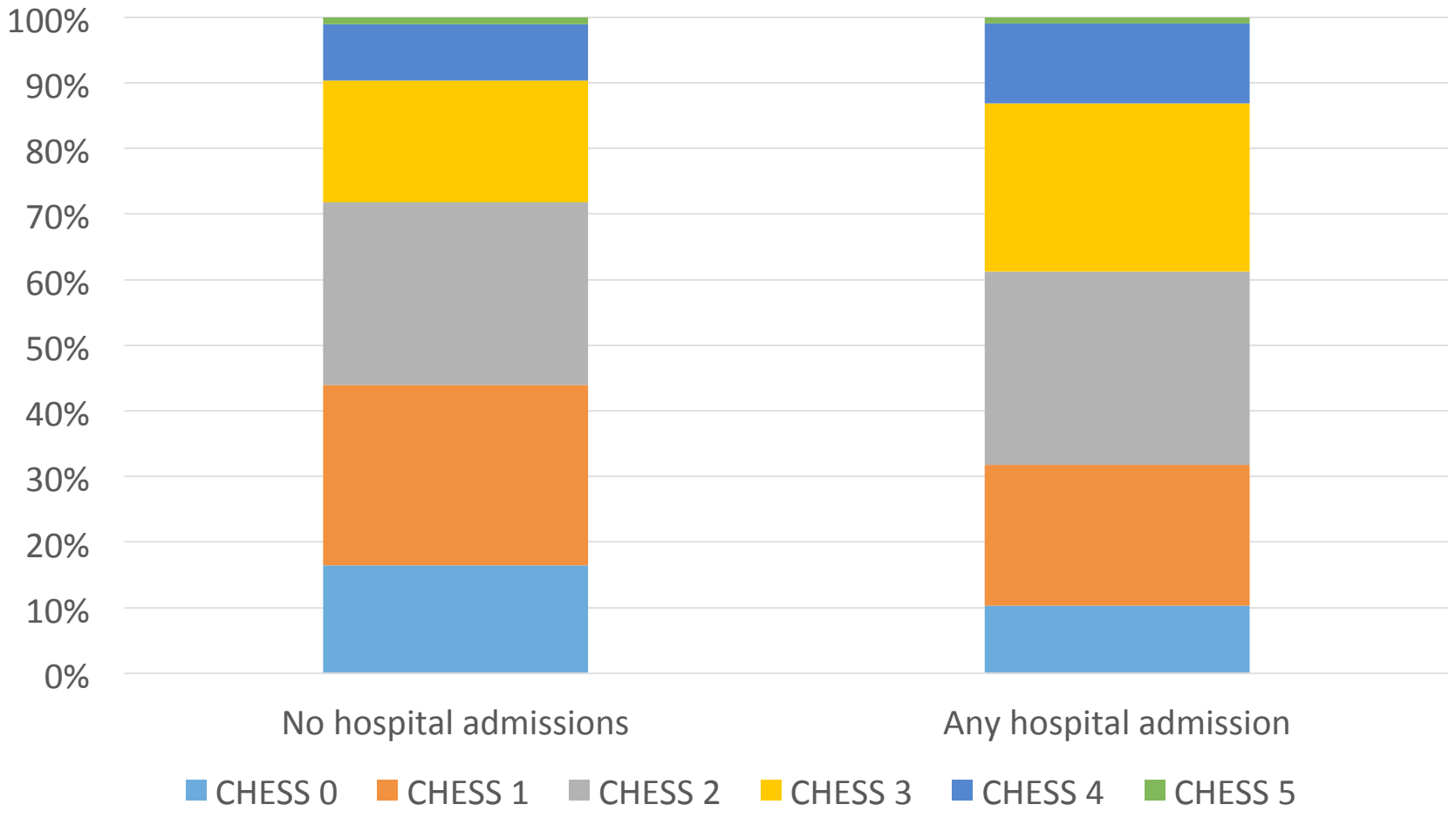
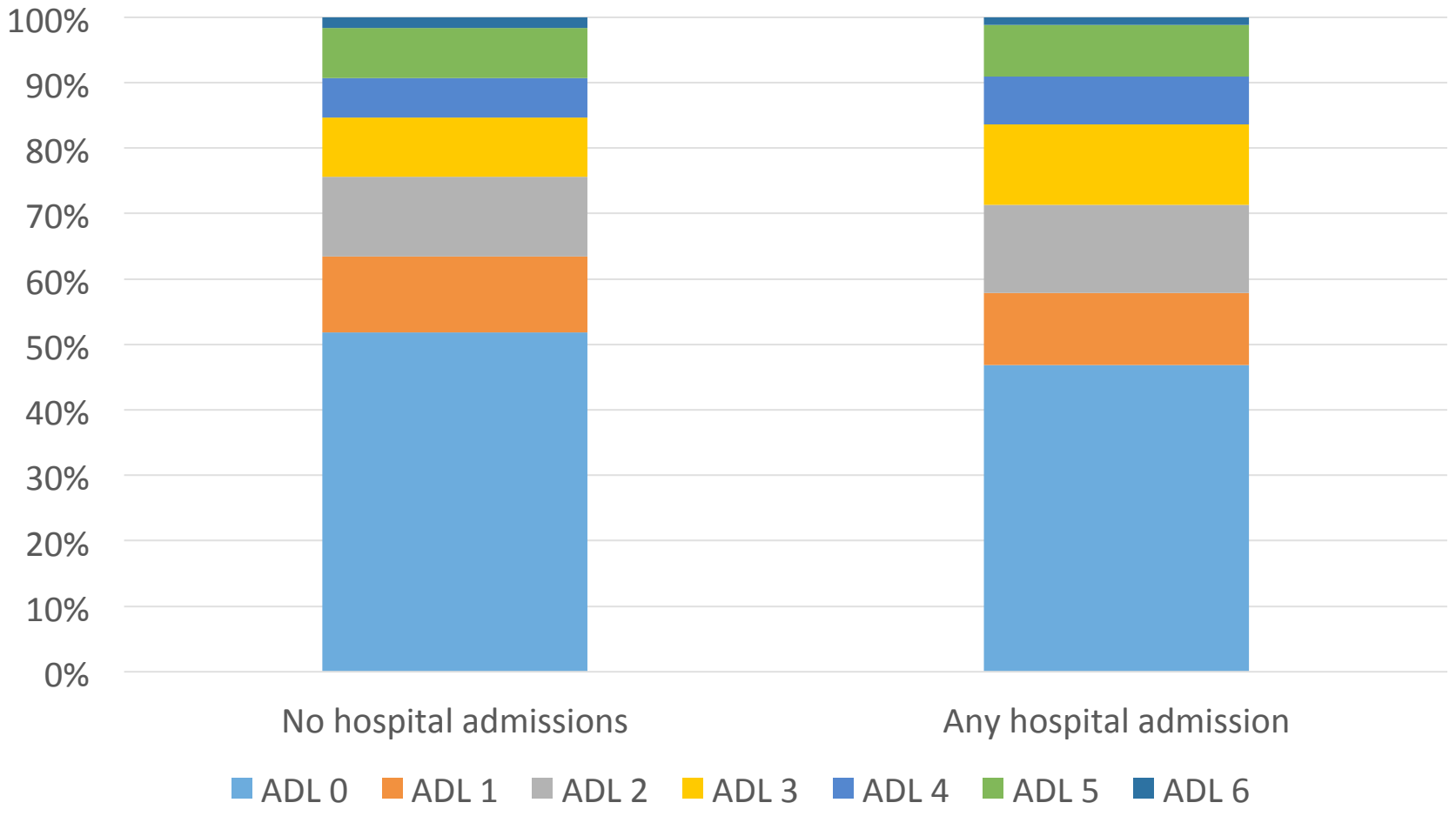
Variable	Mean	Median	Std. Dev.	Min	Max
Outcome variables					
Any hospital admission	0.305	0	0.461	0	1
Number of hospital admissions	0.848	0	1.672	0	17
Number of bed days	3.571	0	16.110	0	625
Any dementia admission	0.043	0	0.203	0	1
Mortality	0.286	0	0.452	0	1
Explanatory variables					
CHESS	1.885	2	1.232	0	5
ADL	1.402	0	1.751	0	6
MAPLe	3.395	4	1.414	1	5
Control variables					
Gender (1=male)	0.390	0	-	0	1
Age	81.565	83	8.354	51	105
Ethnicity (1=Māori)	0.100	0	-	0	1

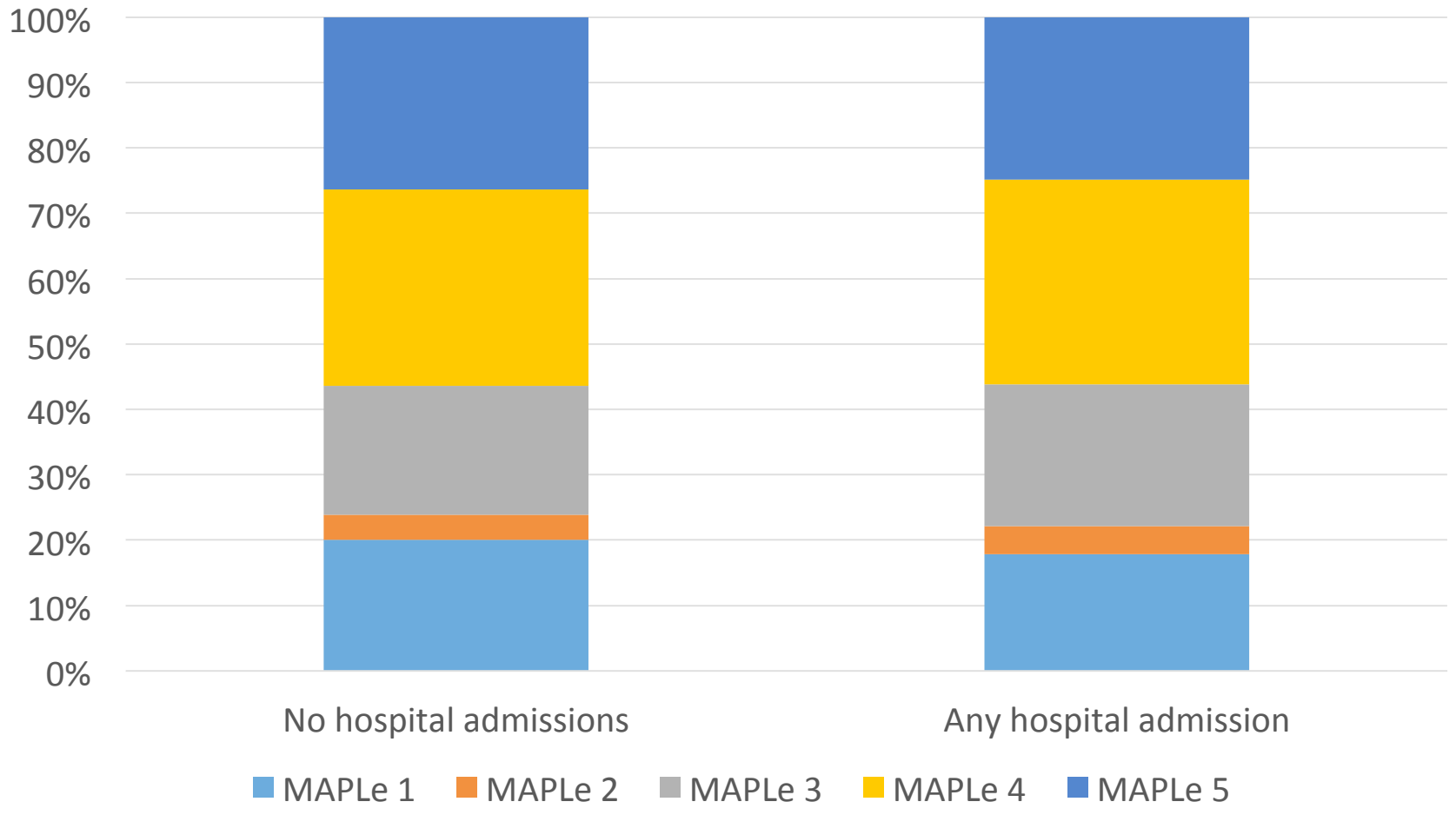
Hospital admissions and CHESS score



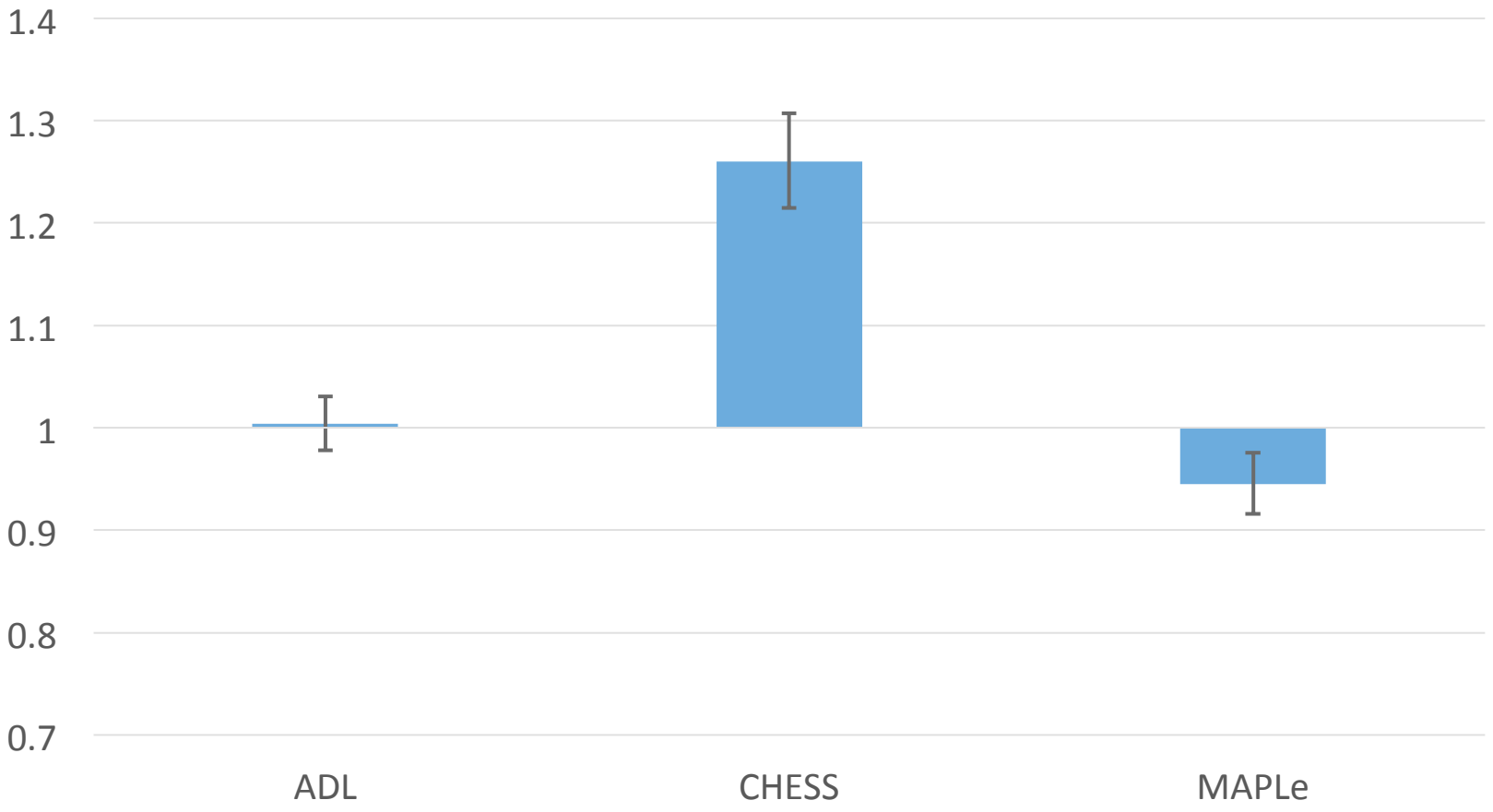
Hospital admissions and ADL score



Hospital admissions and MAPLe score

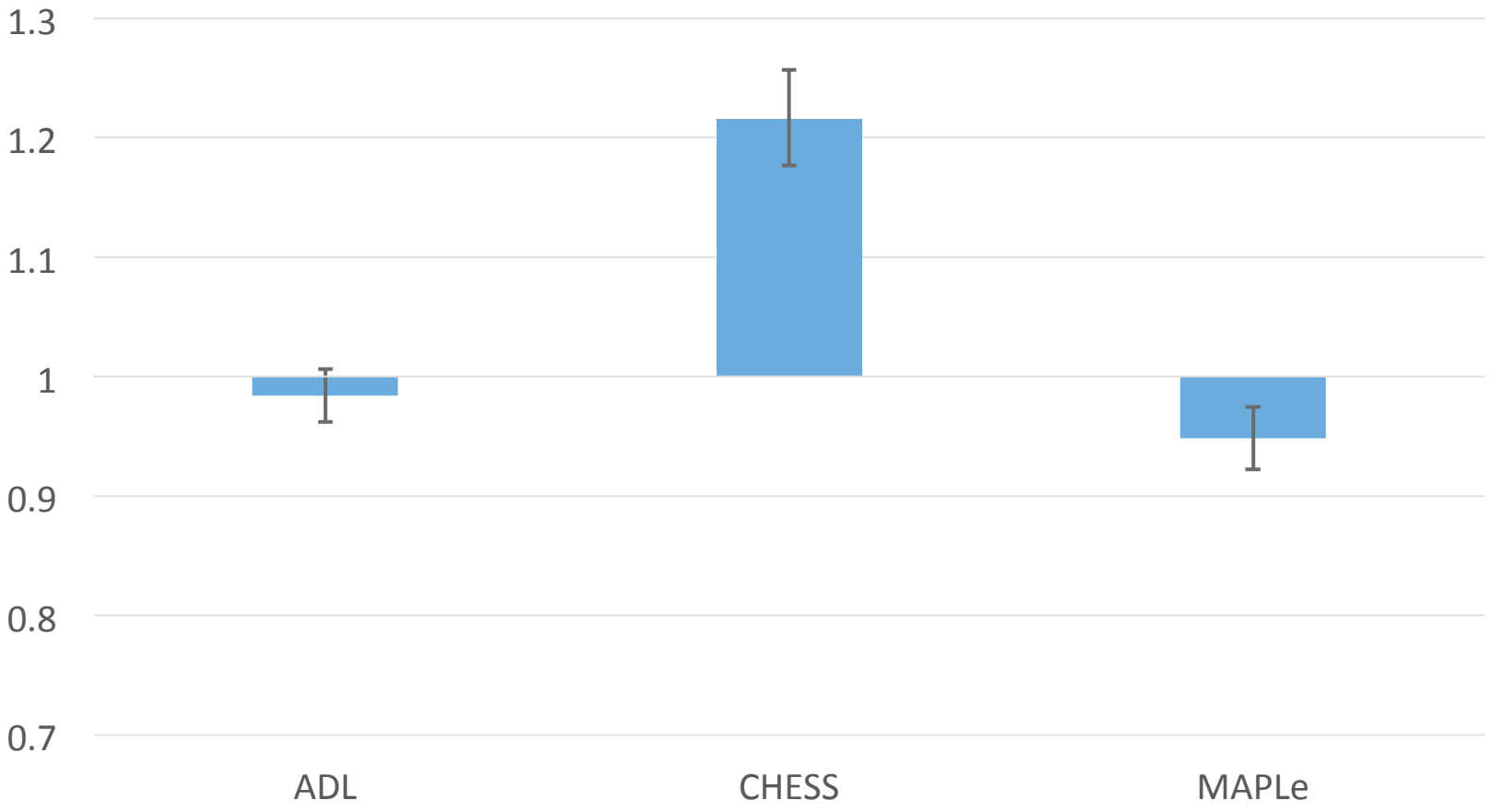


Results:
Any hospital admission



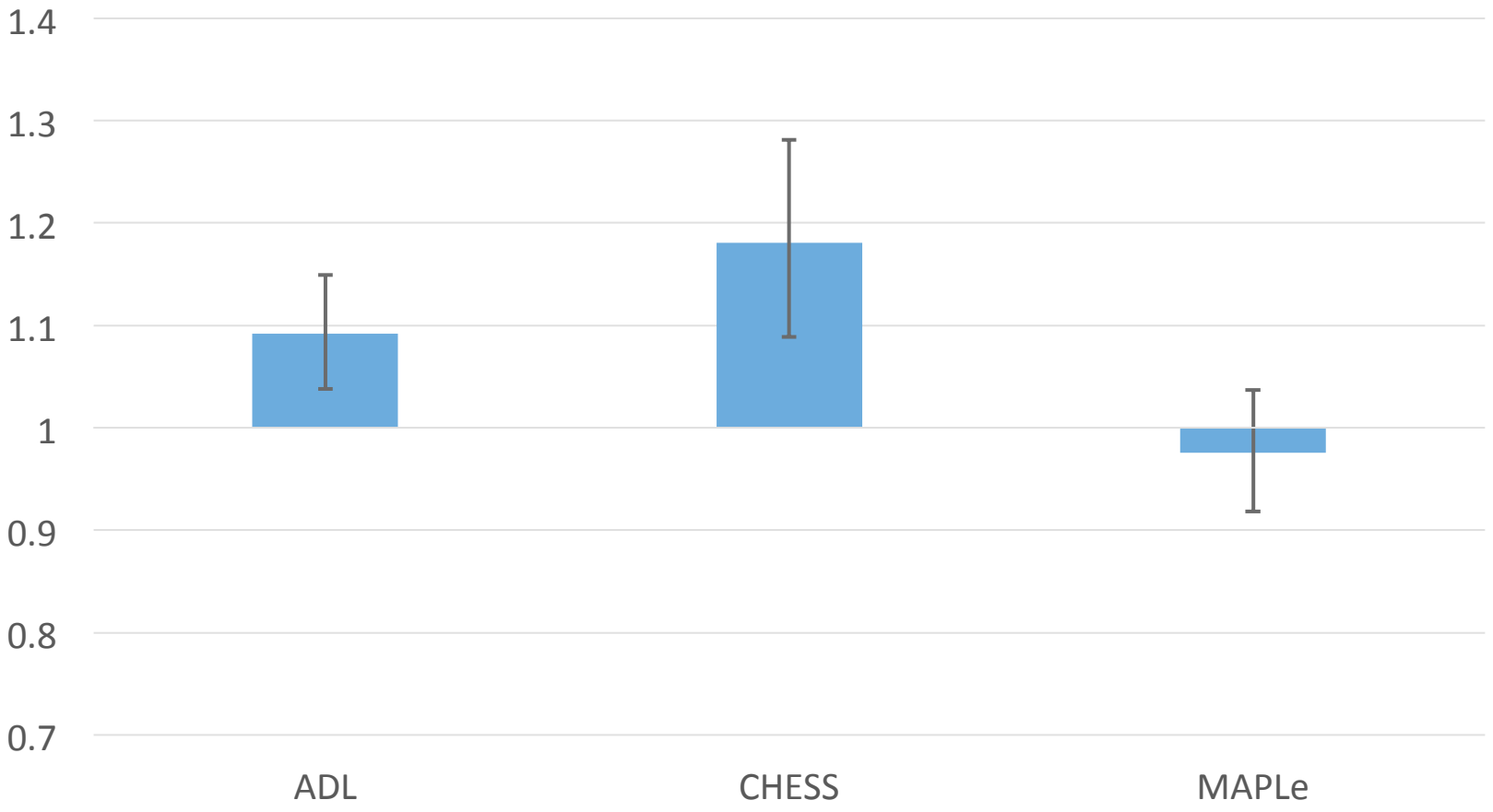
Controlling for gender, ethnicity, age and age-squared

Results: Number of hospital admissions



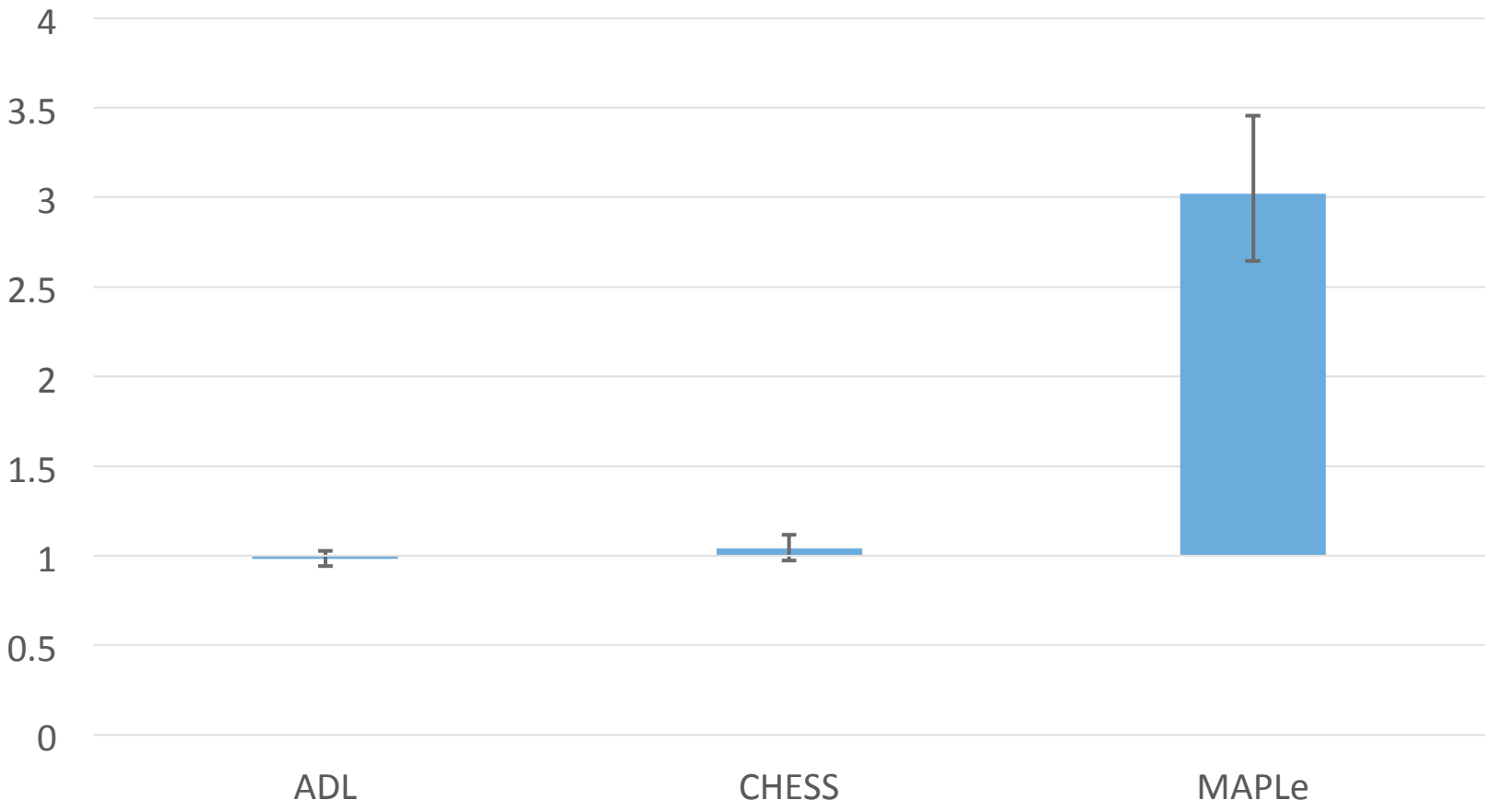
Controlling for gender, ethnicity, age and age-squared

Results: Number of bed days



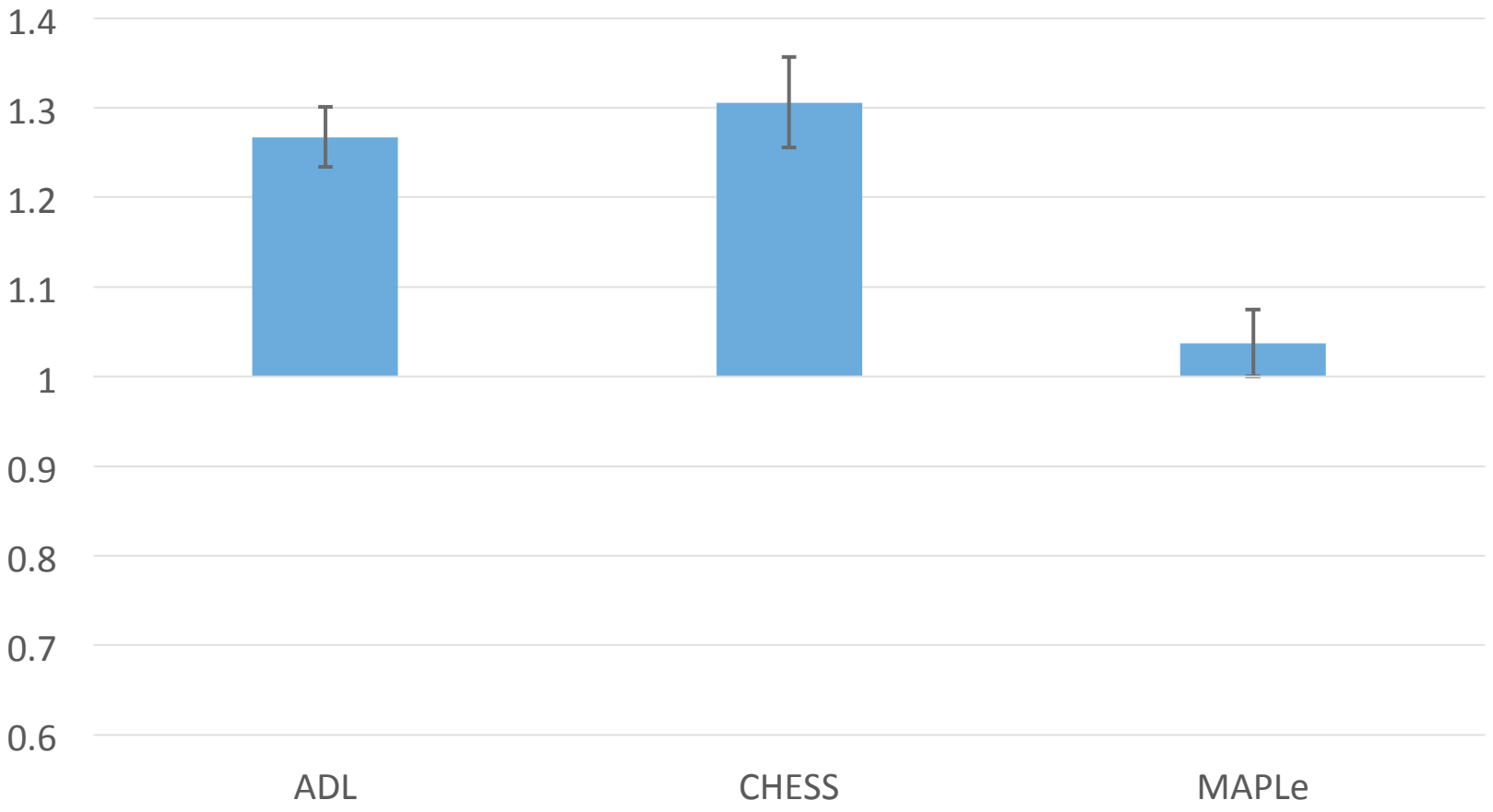
Controlling for gender, ethnicity, age and age-squared

Results: Any dementia admission



Controlling for gender, ethnicity, age and age-squared

Results: Mortality



Controlling for gender, ethnicity, age and age-squared

Any hospitalisation vs. categorical CHESS score

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CHESS Score	Coeffient	Standard Error
CHESS = 1	1.253	0.093
CHESS = 2	1.696	0.122
CHESS = 3	2.224	0.166
CHESS = 4	2.312	0.203
CHESS = 5	1.283	0.277

Controlling for gender, ethnicity, age and age-squared (but not ADL or MAPLe)

Other results

- When we break the CHESS score down into its components, it appears that some components are more predictive than others, especially:
  - *Change* in ADL status
  - Vomiting
  - Peripheral edema
  - Dyspnoea
  - Weight loss
- These have important (and obvious) clinical implications

Other results

- We also looked at Clinical Assessment Protocol (CAP) data from the InterRAI dataset
- The strongest predictors amongst the CAPs were:
  - ADL
  - Institutional risk
  - Falls
  - Cardio
  - Medication

Translating research into practice

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- Waikato DHB utilises a care management service for adults with long term needs
- The Needs Assessment Agency assesses older people (65+) who have long term support needs using the InterRAI Contact Assessment (for those people with non-complex needs) and InterRAI Home Care assessment (for those older people with complex needs)
  - 300 to 400 older people are assessed monthly
  - 35 to 50% have a CHESS score between 2 and 4
- On basis of this research, we would expect 30-40% (45-60 people) will be in hospital within 90 days
- These ‘at-risk’ older people are now being targeted for early screening and more regular reviews/assessments other than the routine annual assessments

Translating research into practice

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- Waikato DHB operates an early supported discharge team (Supported Transfer and Accelerated Rehabilitation Team [START]), which can also provide proactive community interventions for older people
- START can provide intensive rehabilitation for up to 6 weeks, up to 4 visits a day, 7 days a week from rehab aides, under the guidance of registered nurses, allied health and specialist geriatricians. The service has been successfully evaluated by RCT (published in *Age and Ageing*, 2017)
- Of the 'warning CAPS' of 'at risk' older people, several have been identified as potentially reversible if START intervention is used
- So, once such warning CAPS are triggered, a referral to START is immediately made
- A business case is currently under development to expand this approach, with a new programme to be implemented in 2018

Conclusions

- The InterRAI data (especially the CHESS score) can be used to identify older people at higher risk of hospitalisation, dementia admission, and those needing more care (and more cost to the health system)
- These results are being used to inform targeted interventions, and integrated into the Disability Support Link action plan

Where to from here?

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- We are currently looking in more detail at the InterRAI assessment data and mortality
  - Specifically, we are constructing a model that will provide a mortality risk assessment for any older person admitted to hospital
- This model will help ED staff, surgery staff, etc. to assess the risk of alternative interventions

Acknowledgements

- This research was joint work with Matthew Parsons (University of Auckland), Graham Guy (Waikato DHB), Vardhan More (Waikato DHB), and Tobias Dean (University of Waikato):
  - Supported through a University of Waikato Summer Research Scholarship for Tobias Dean

Thanks!

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