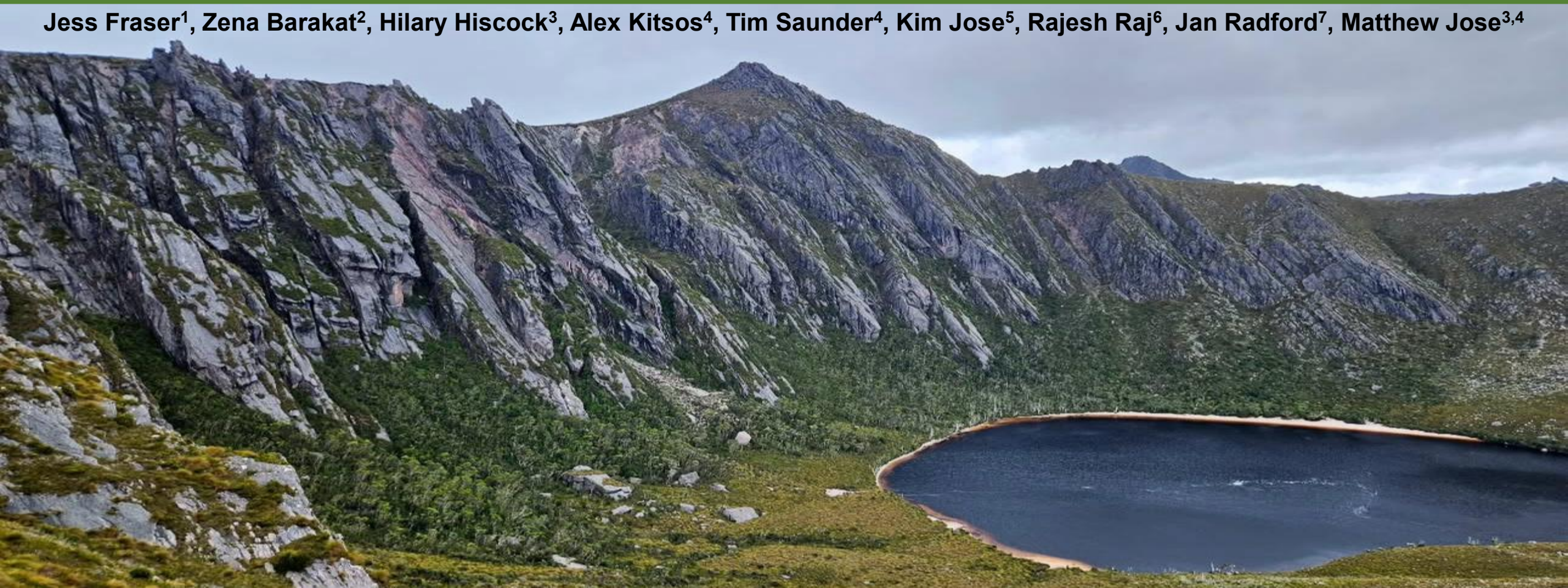
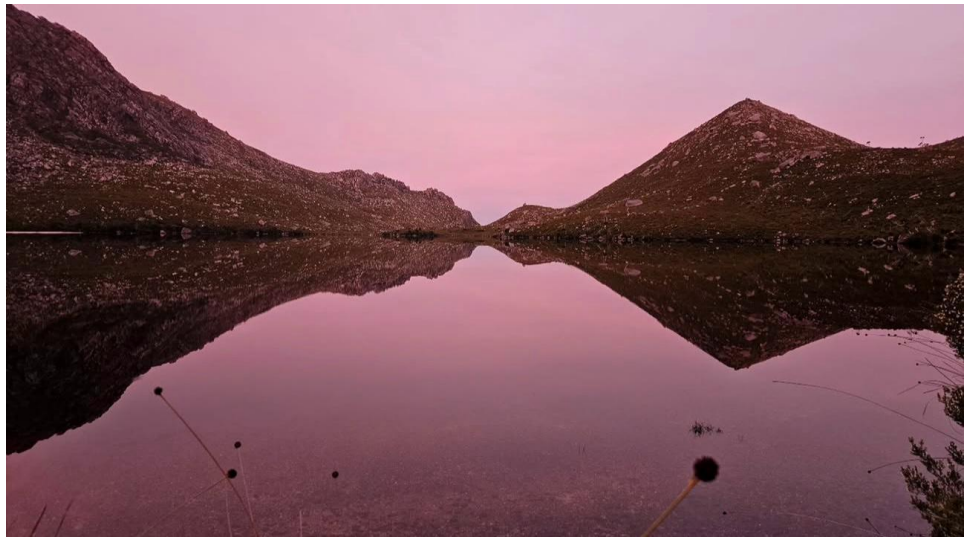
Rural Health In Crisis: Investigating The Persistent Rise Of Chronic Kidney Disease In Australian Communities

Jess Fraser[1], Zena Barakat[2], Hilary Hiscock[3], Alex Kitsos[4], Tim Saunder[4], Kim Jose[5], Rajesh Raj[6], Jan Radford[7], Matthew Jose[3,4]



Acknowledgement of country

This work was conducted in *lutruwita* (Tasmania) Aboriginal land. I acknowledge, with deep respect the traditional owners of this land, the muwinina and palawa peoples, their elders past, present and emerging.



Aim

To examine the sociodemographic factors contributing to variation in the increasing prevalence of chronic kidney disease (CKD) in rural and remote communities

CKD Data: Measured

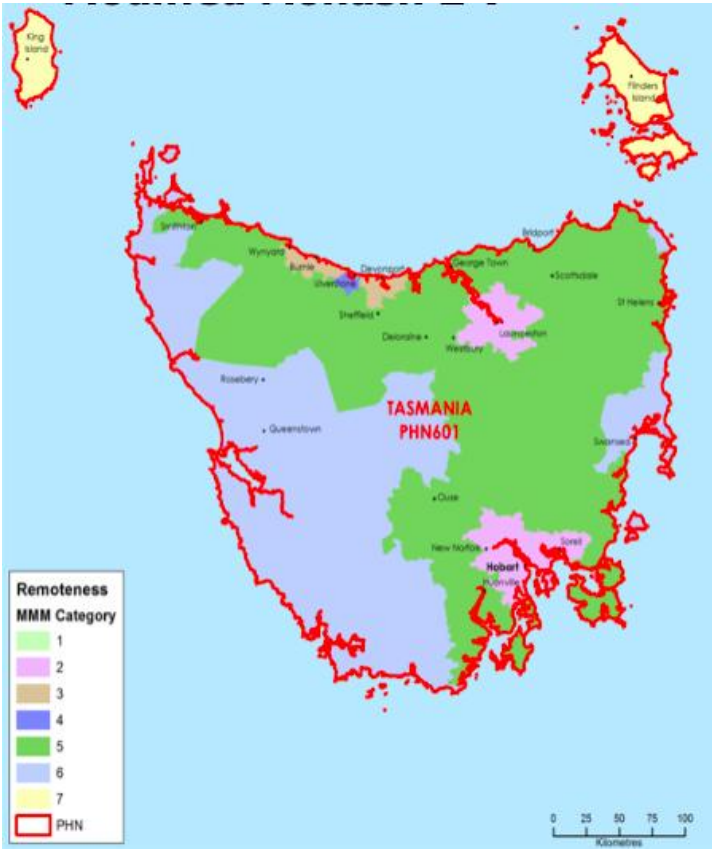
CKD.TASlink database

Sociodemographic Data: Self-Reported

Tasmanian Population Health Survey

Background

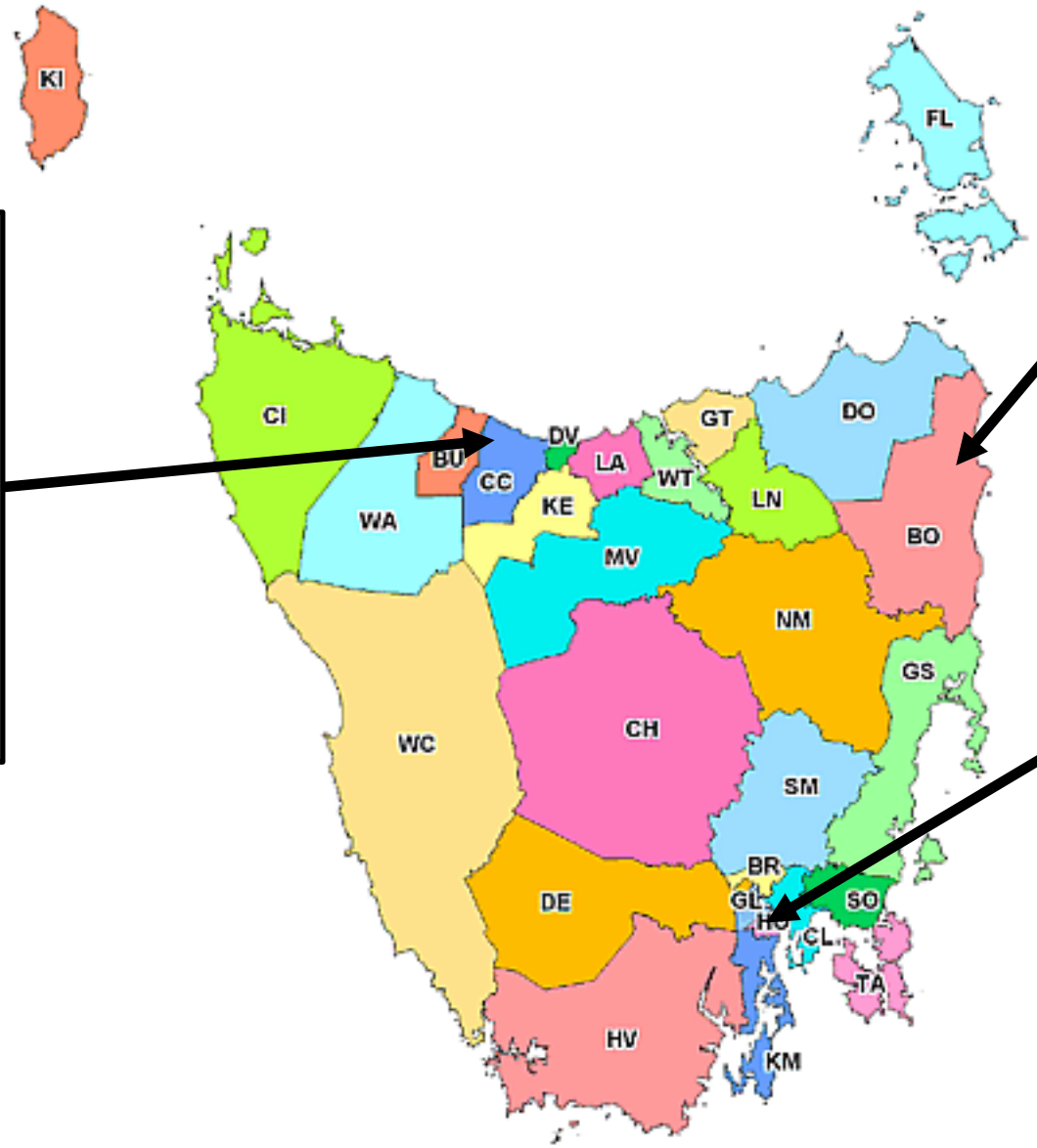
- Tasmania has the **highest state prevalence** of CKD
  - 11.3% in Tasmania[1,2]
- Impact of CKD
  - Mortality rate **1.8x higher** in low socioeconomic areas[3]
  - **Higher hospitalization rate** in remote areas[3]
- Tasmania
  - Population 557, 571
  - **Modified Monash (MM)[5] classification 2-7**
  - Population 5 years **older** than national average[1]
  - **Lowest weekly earnings** on average in Australia[1]
  - **Highest rates of comorbidity** per state[1]



[1]ABS 2022 [2]KHA 2016 [3]AIHW 2024 [4]Modified Monash Model 2025

Local Government Areas (LGA)

Central Coast Area
- MM3-4
- N = 23 331
- 25.6% >65 years[5]
- 18.5% ≥3 comorbidities[6]



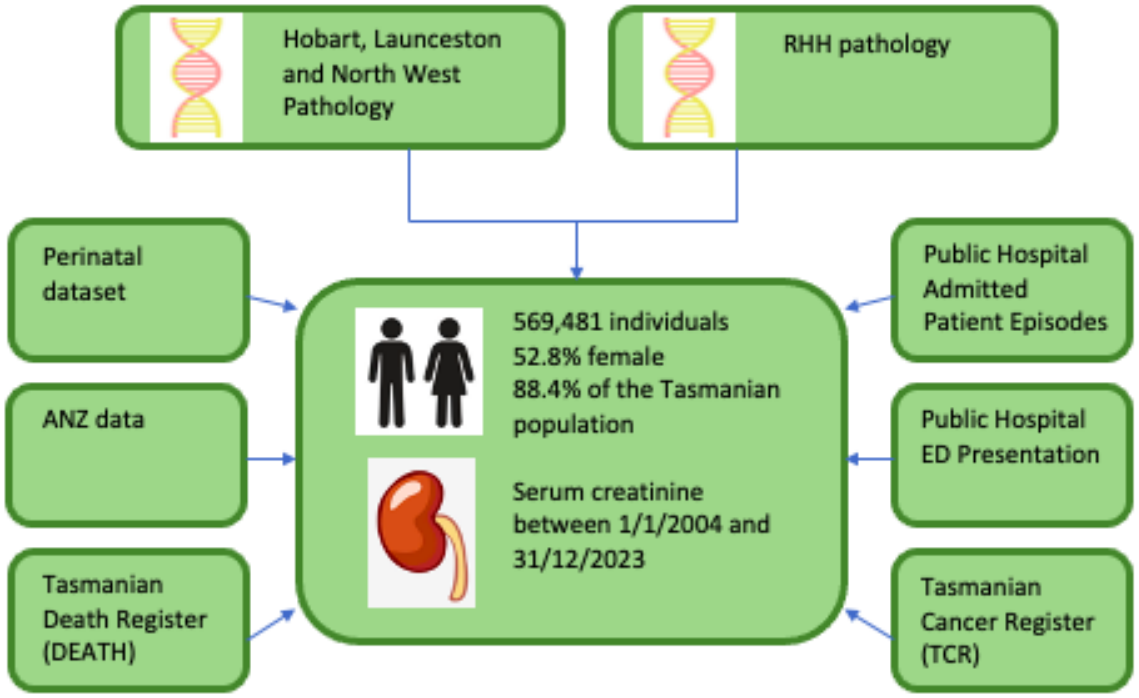
Break O'Day Area
- MM5-6
- N = 7 075
- 33.3% >65 years[5]
- 47.5% ≥3 comorbidities[6]

Hobart Area
- MM2
- N = 55 964
- 18.4% >65 years[5]
- 15.6% ≥3 comorbidities[6]

[5]TasPOPP 2024 [6]TPHS 2022

Method: CKD vs Sociodemographic Data

CKD Data: CKD.TASlink dataset	Sociodemographic data: Tasmanian Population Health Study (TPHS) 2022
• Retrospective cohort study • 1/1/2004 to 31/12/2023	• Cross sectional • Telephone interviewing • Between Sept-Nov 2022 • Quotas for each LGA • Number of respondents 4061; response rate 29%



Results

Patterns of sociodemographic and health behavior across local government areas

Self reported vs measured CKD

Environmental: wood fires, smoking

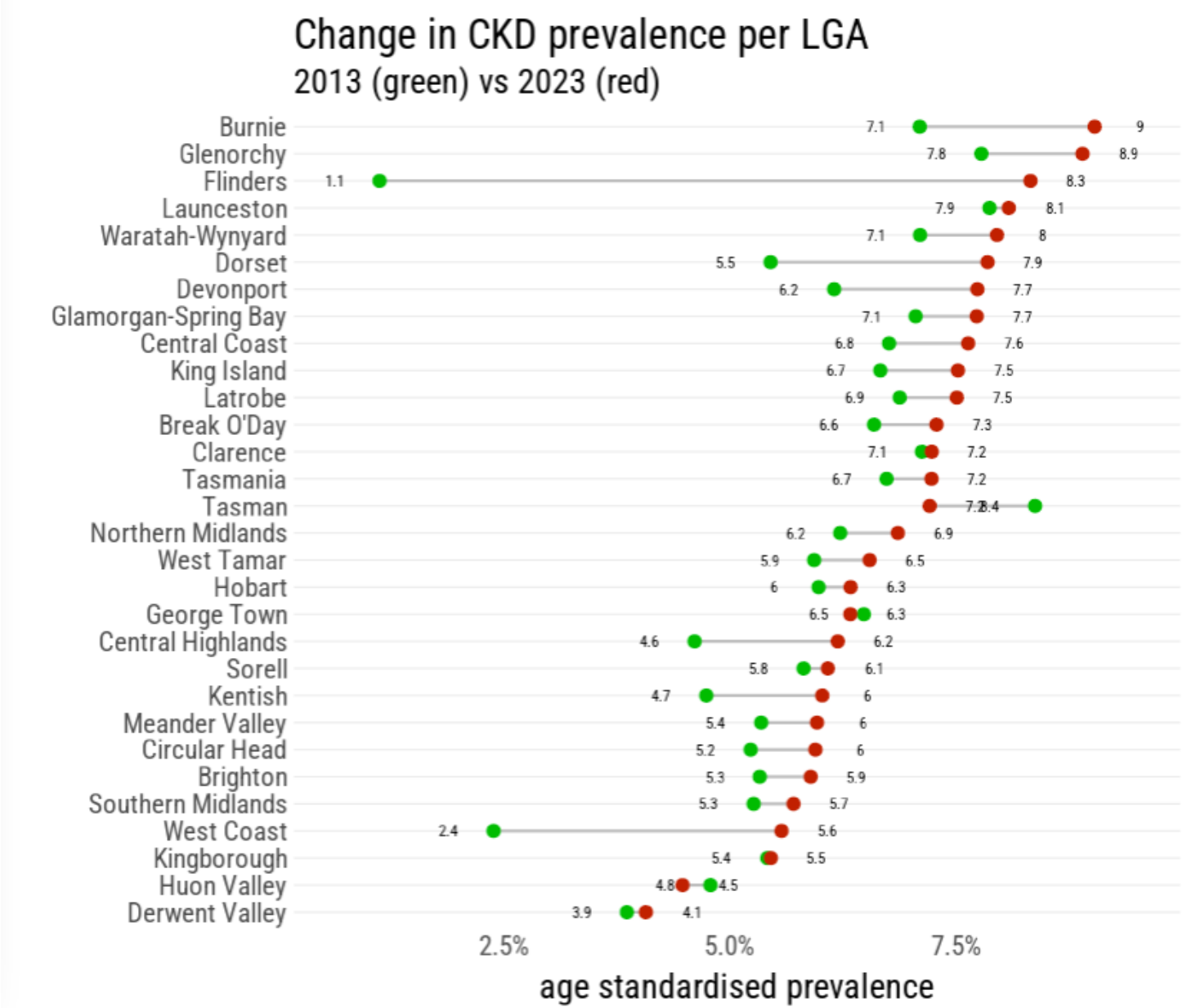
Access to GP, financial hardship

Comorbidities: obesity, diabetes, hypertension

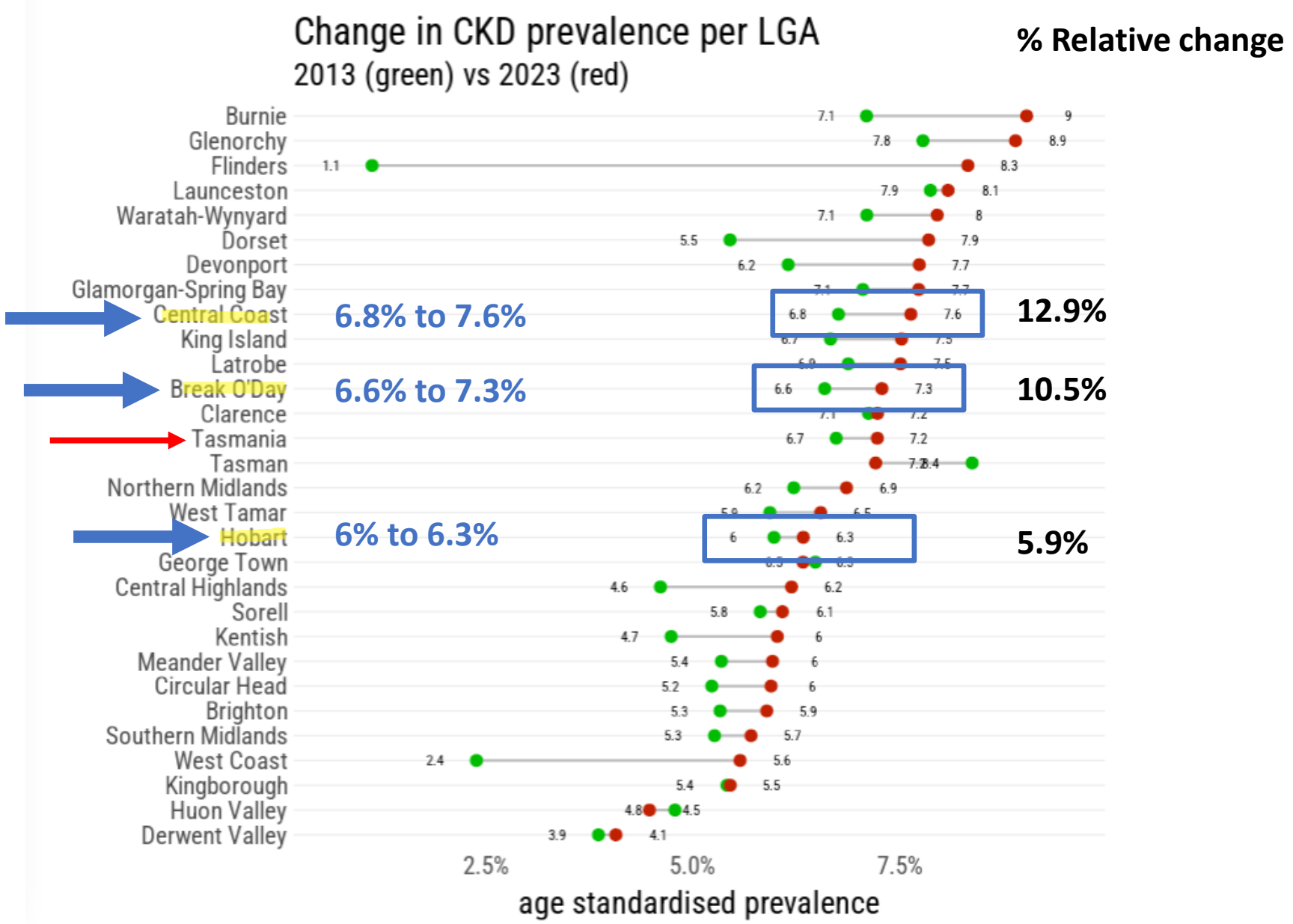
Behavioral: exercise, sedentary lifestyle, diet

Health assessment

Disproportionate Regional Variation



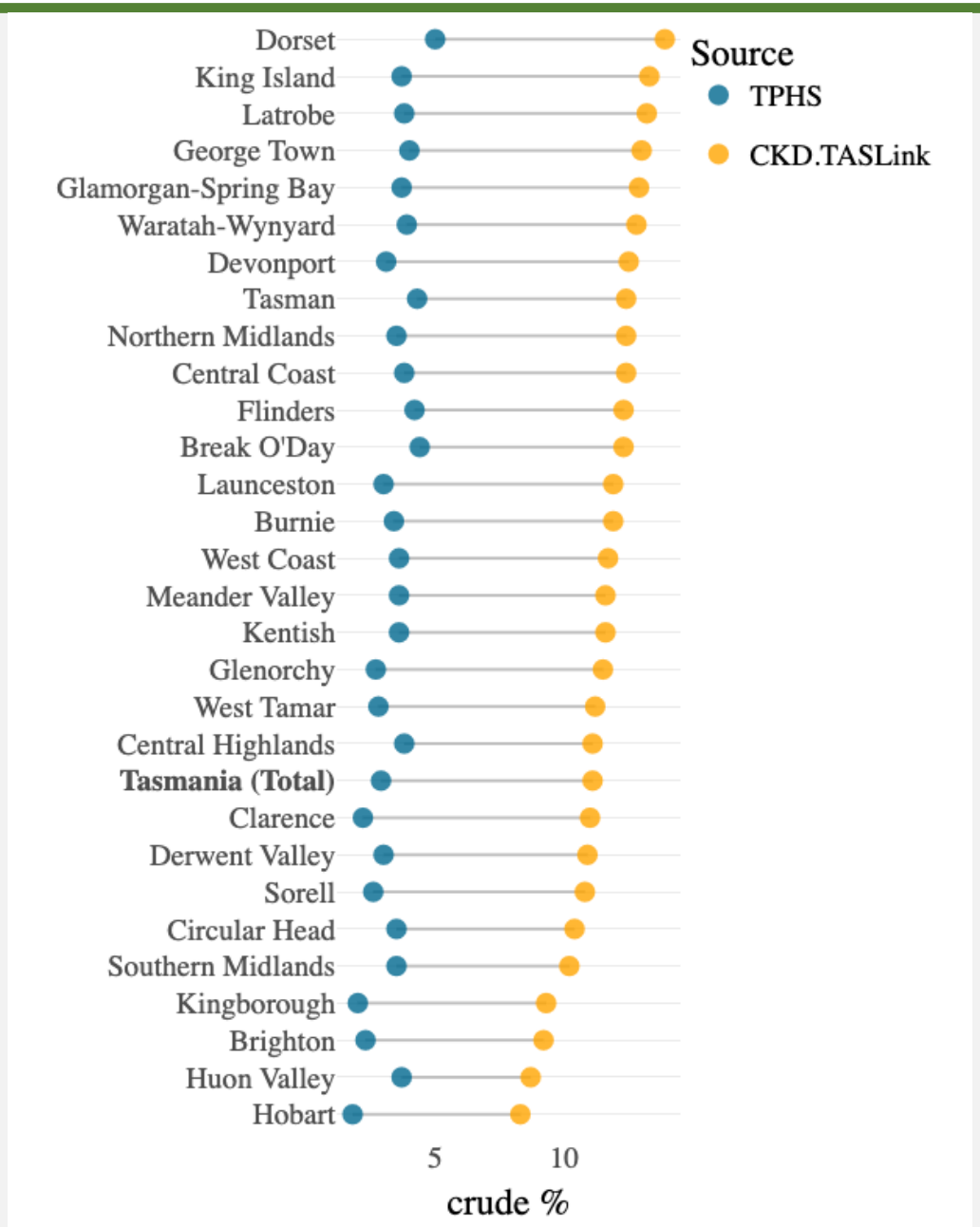
Disproportionate Regional Variation



Results: Self Reported vs Measured CKD Data

CKD awareness gap

- Self reported rates **lower than the measured rates** of CKD
- CKD **only** underreported chronic health condition

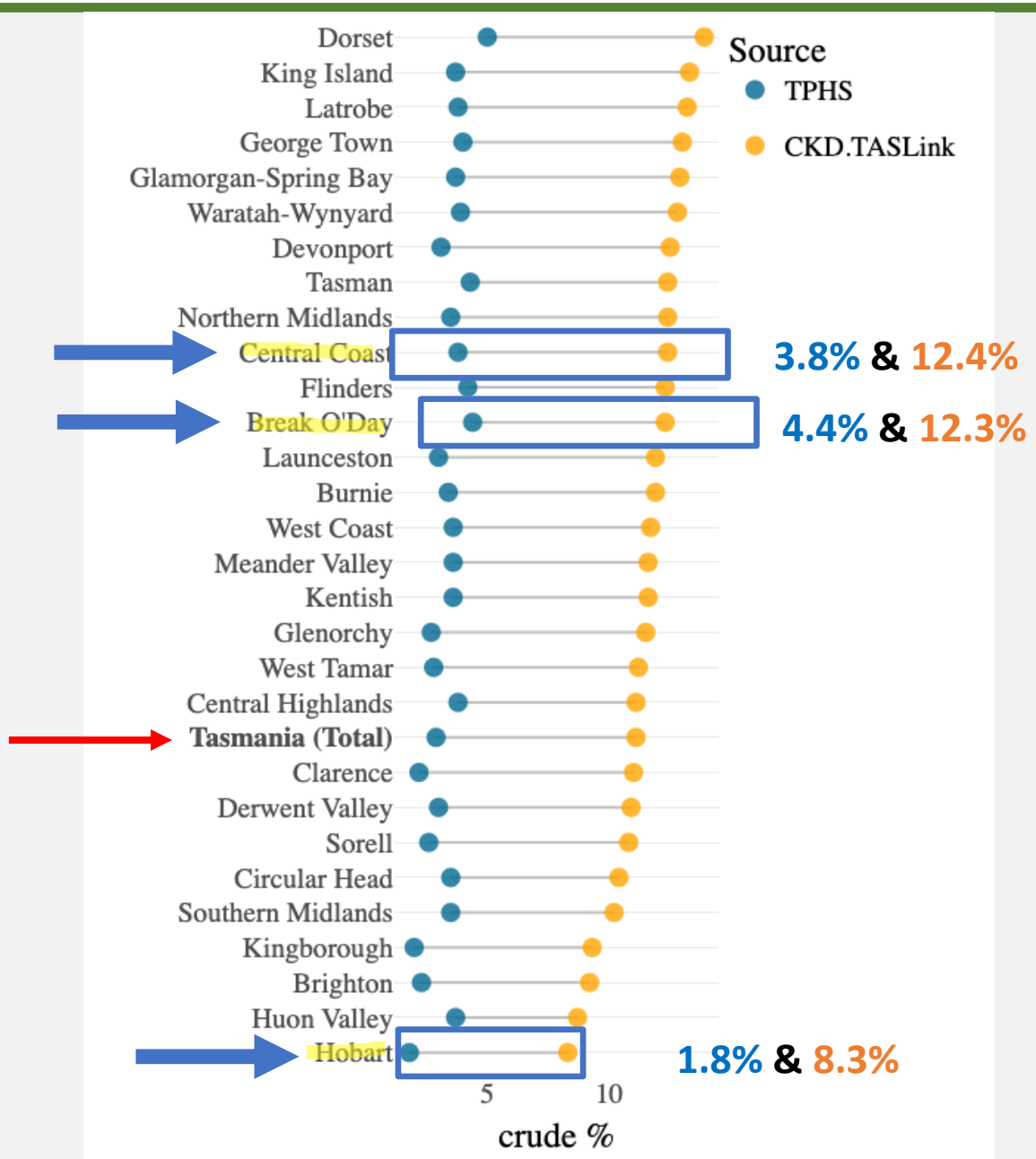


Results: Self Reported vs Measured CKD Data

CKD awareness gap

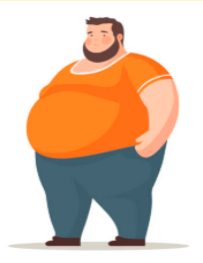
- Self reported rates **lower than the measured rates** of CKD

- CKD **only** underreported chronic health condition

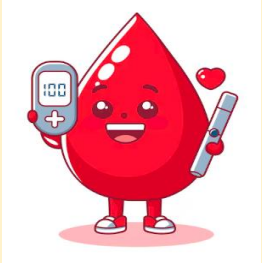


Results: Comorbidities

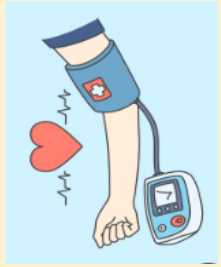
LGA	Hobart	Break O'Day	Central Coast
CKD.TASlink % CKD	8.3%	12.3%	12.4%



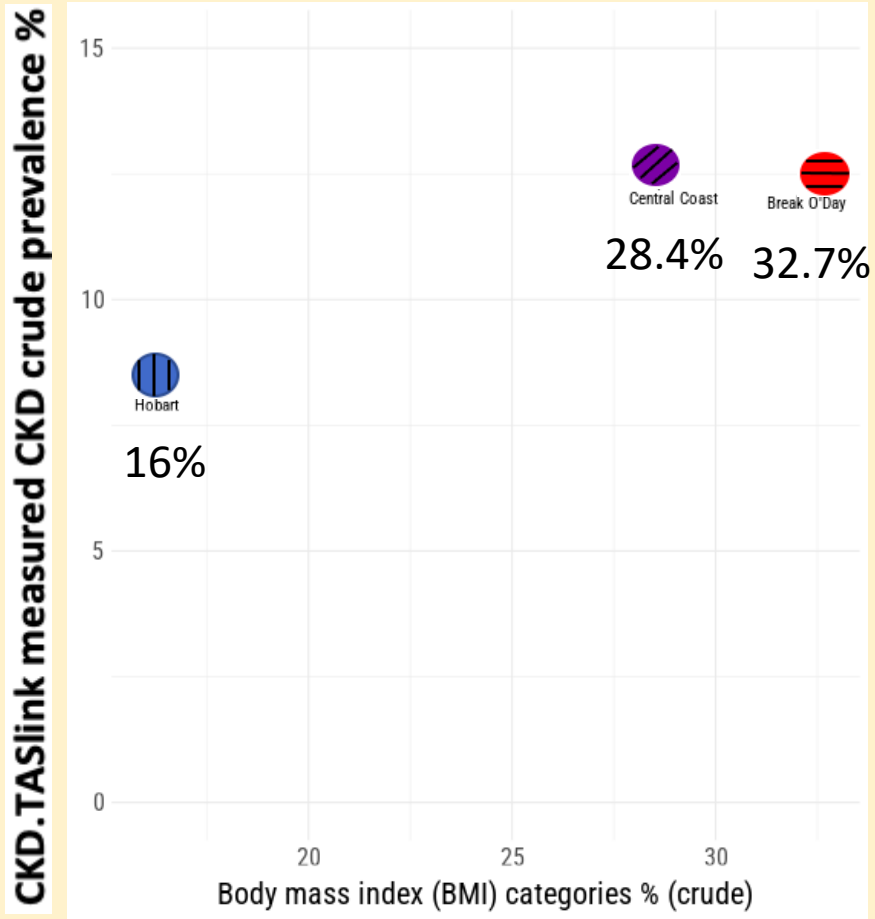
Obesity
BMI ≥30

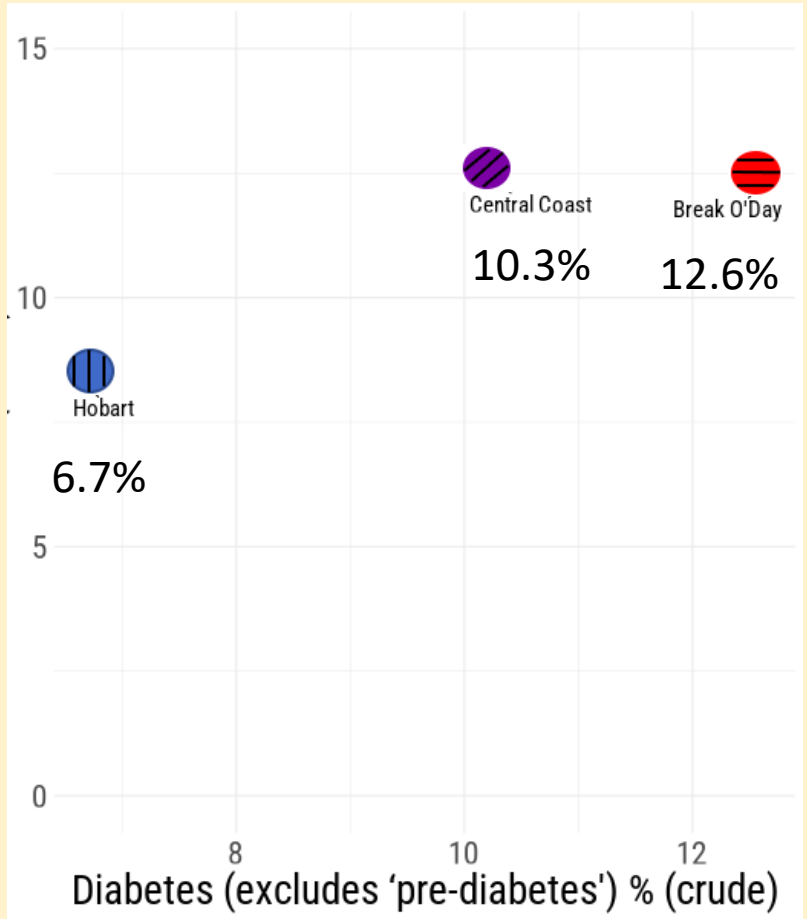


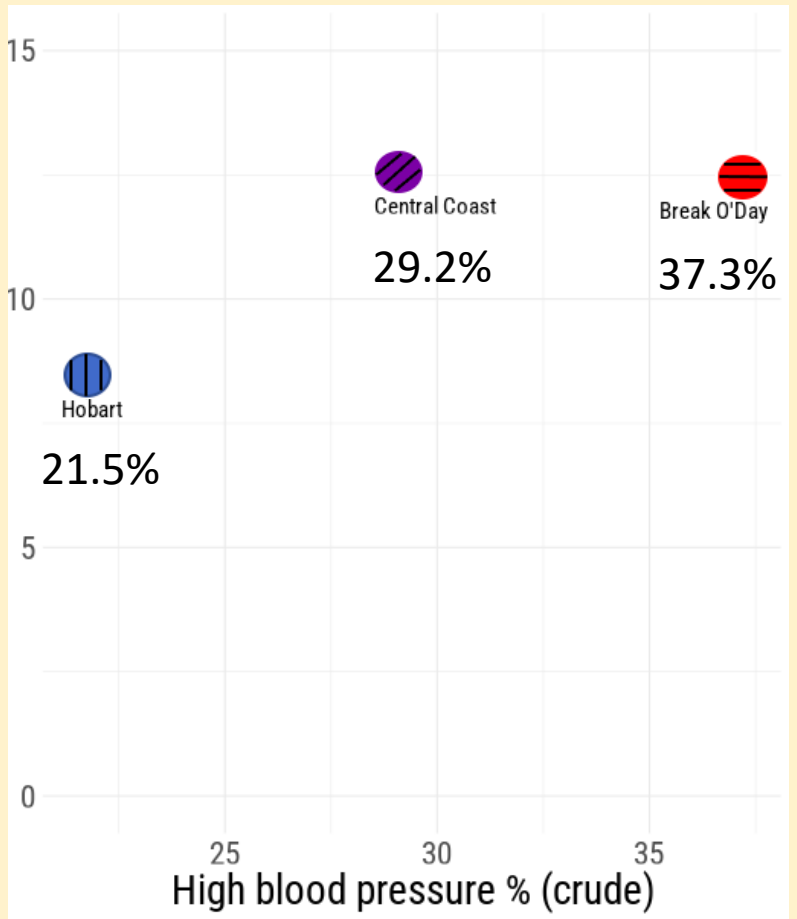
Diabetes



Hypertension







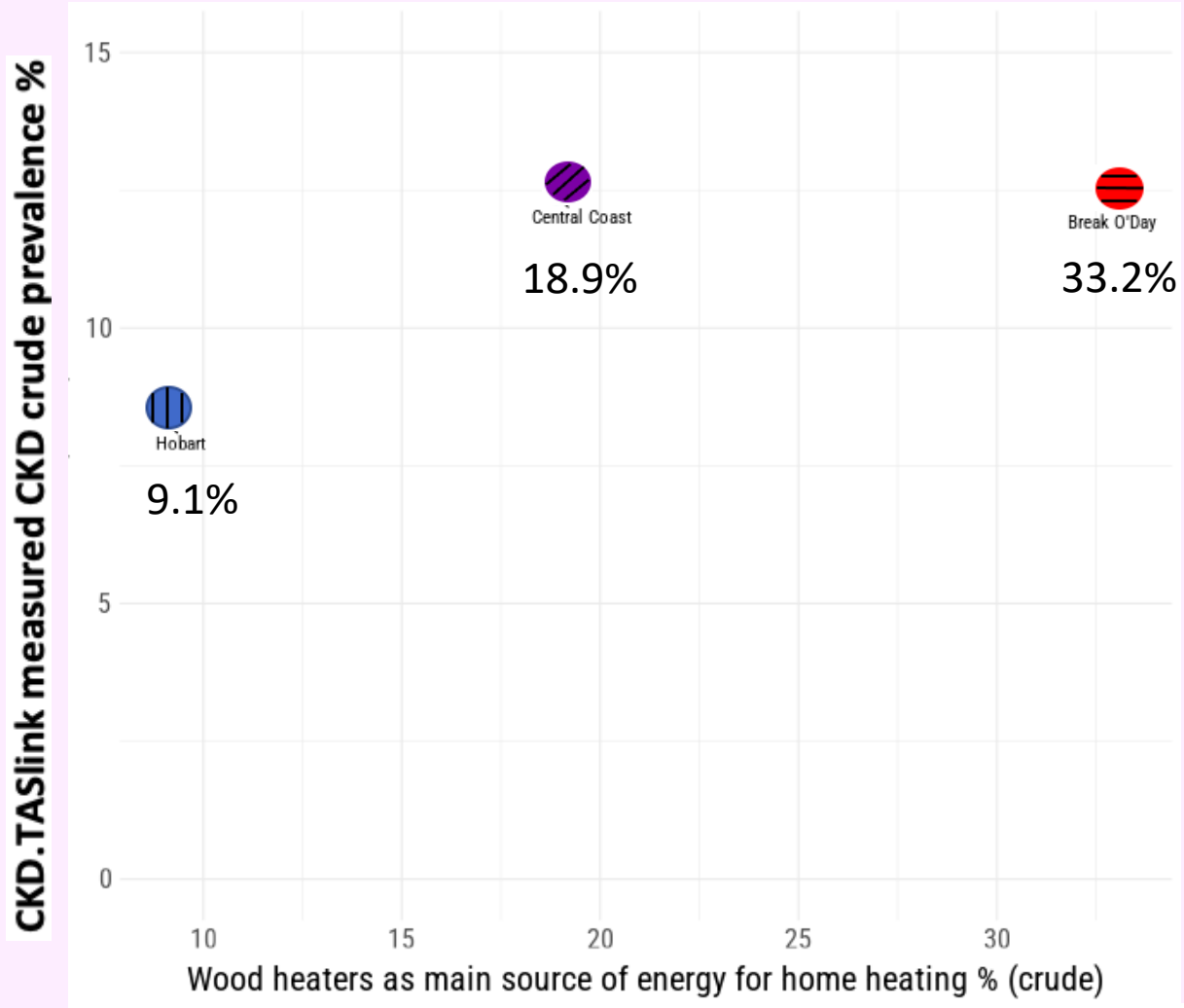
Tasmanian Population Health Survey self-reported data crude prevalence %

Results: Health Behaviors

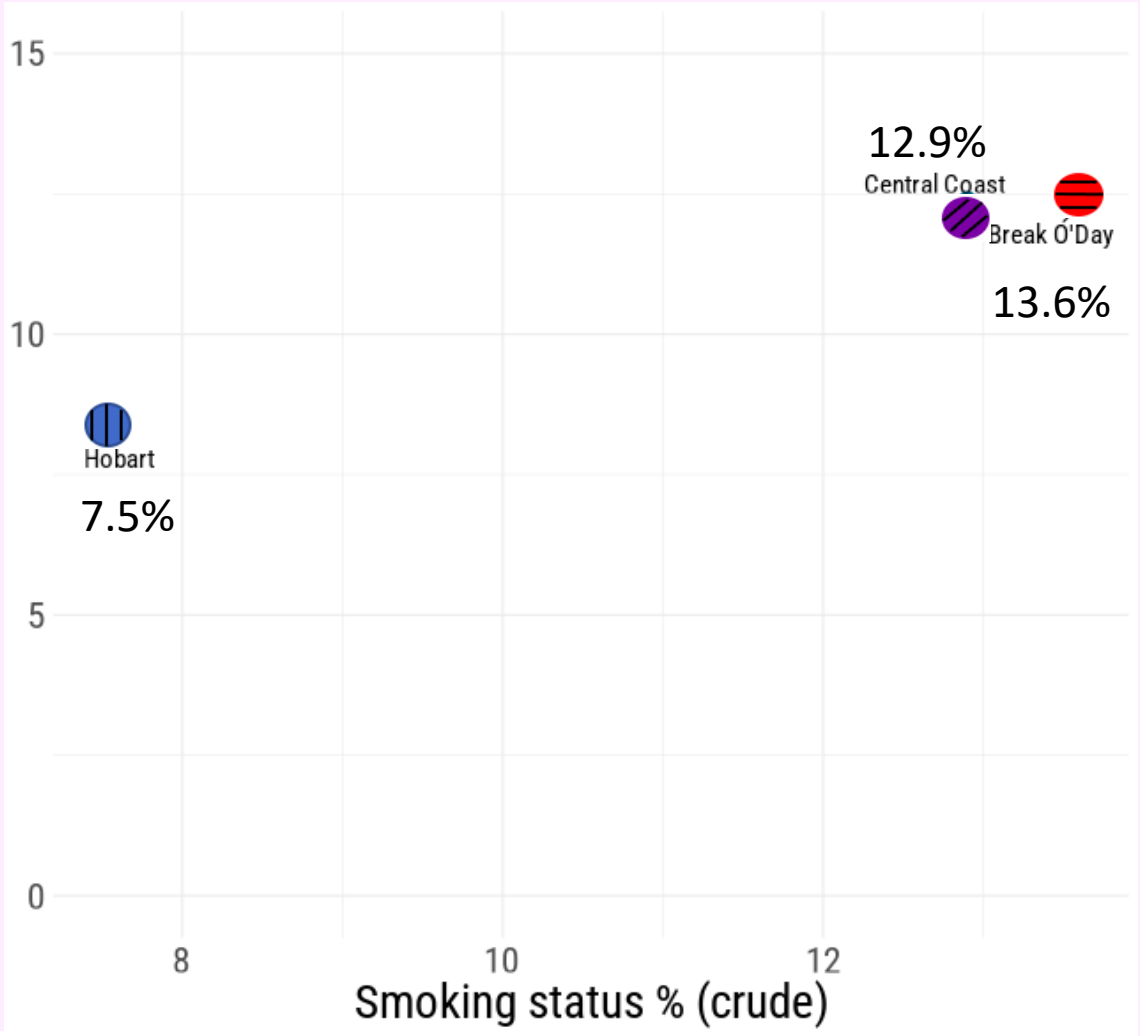
LGA
CKD.TASlink % CKD

Hobart	Break O'Day	Central Coast
8.3%	12.3%	12.4%

Wood heating
Main source of heating



Smoking
Daily



Tasmanian Population Health Survey self-reported data crude prevalence %

Results: Health Behaviors

LGA
CKD.TASlink % CKD

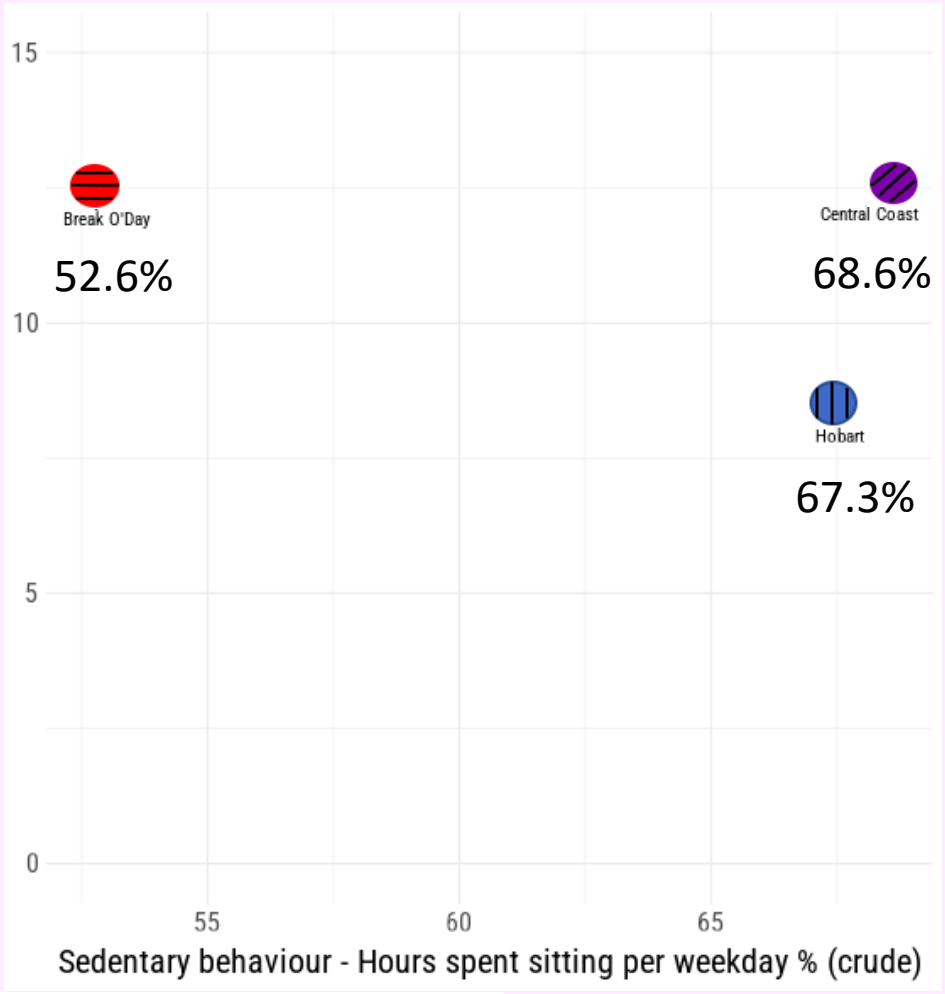
Hobart	Break O'Day	Central Coast
8.3%	12.3%	12.4%

Exercise

≥65 years, met guidelines for moderate to vigorous activity

Sedentary behavior

≥4 hours per weekday



Tasmanian Population Health Survey self-reported data crude prevalence %

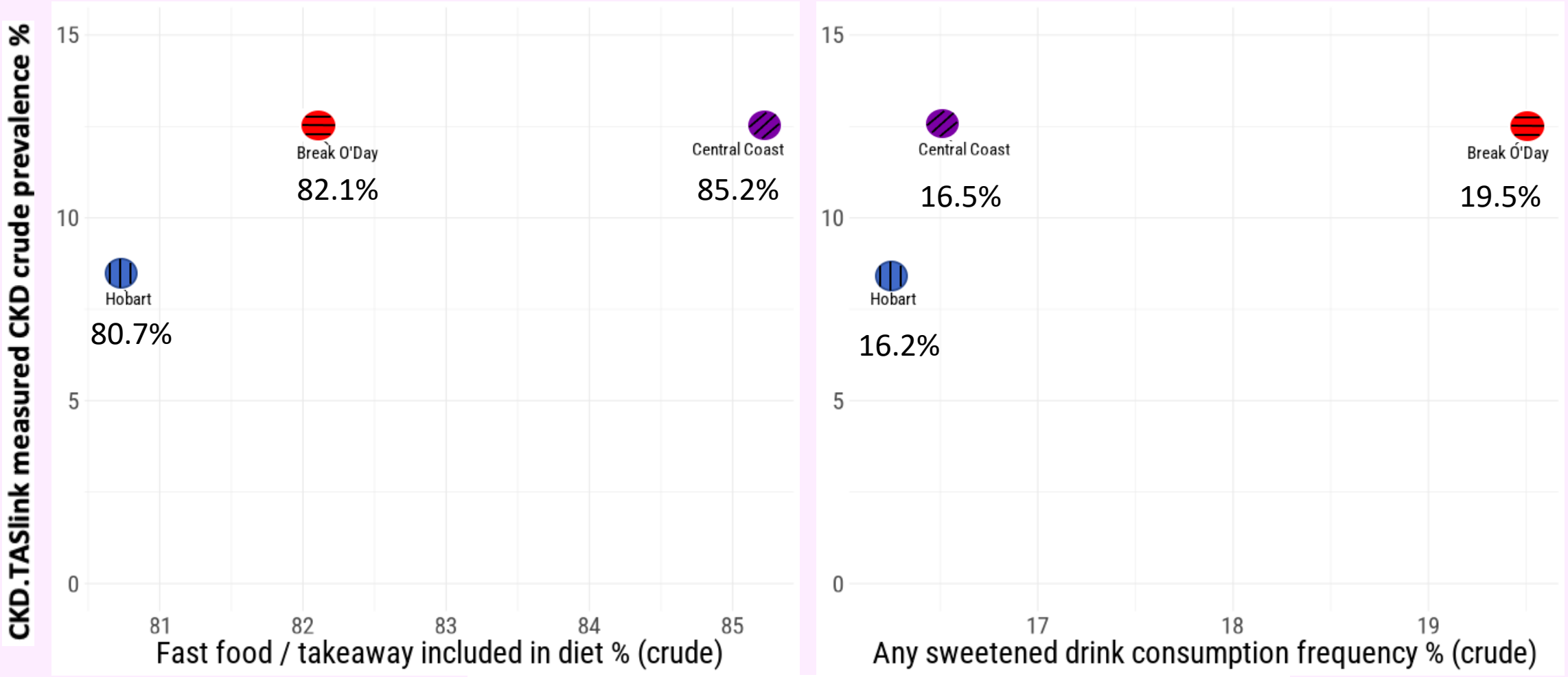
Results: Health Behaviors

LGA
CKD.TASlink % CKD

Hobart	Break O'Day	Central Coast
8.3%	12.3%	12.4%

Fast food
Included in diet

Sweetened drink
Daily

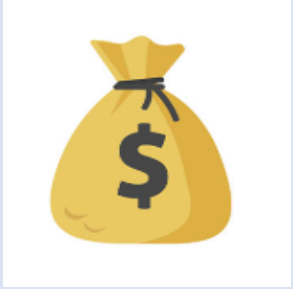


Tasmanian Population Health Survey self-reported data crude prevalence %

Results: Health Access

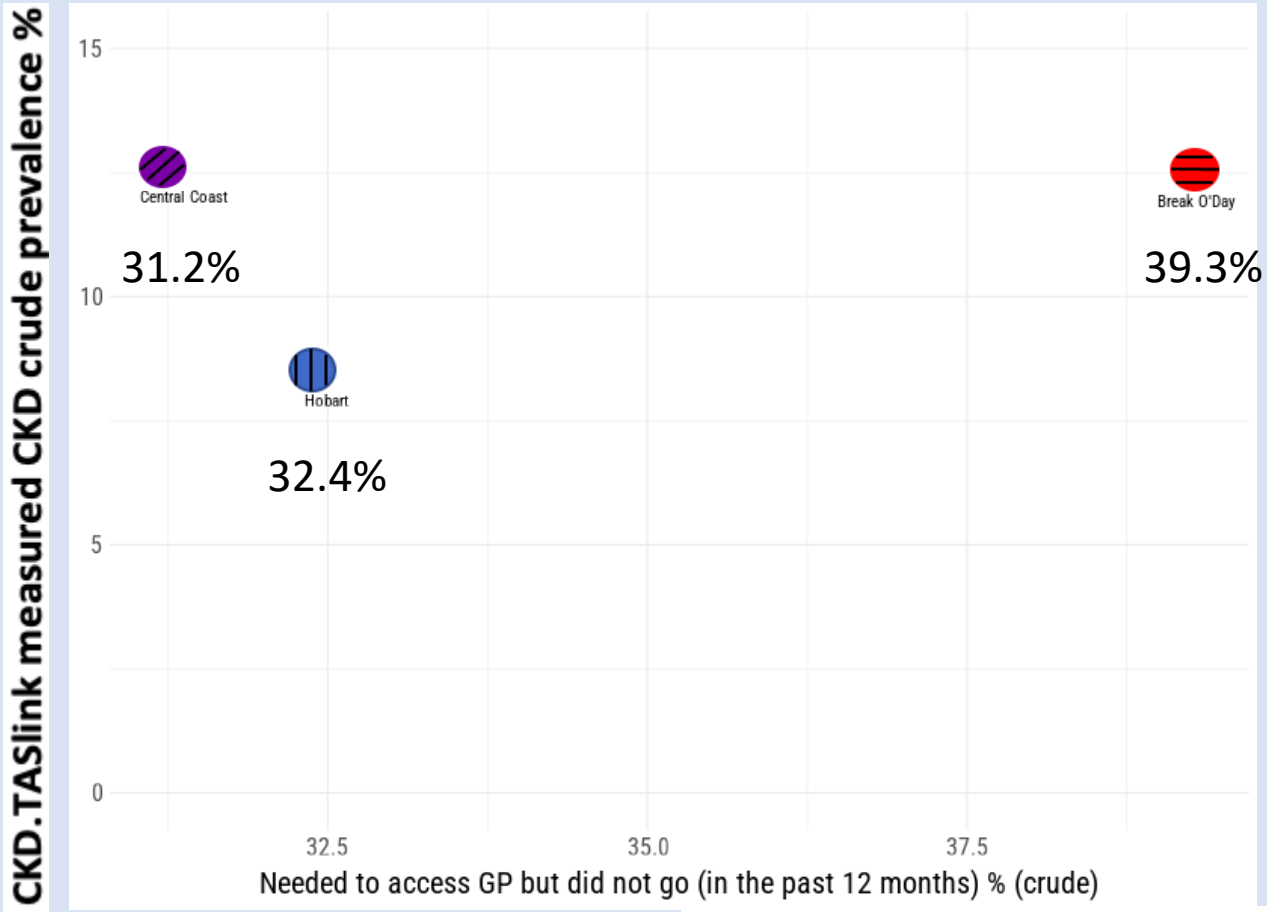
LGA	Hobart	Break O'Day	Central Coast
CKD.TASlink % CKD	8.3%	12.3%	12.4%

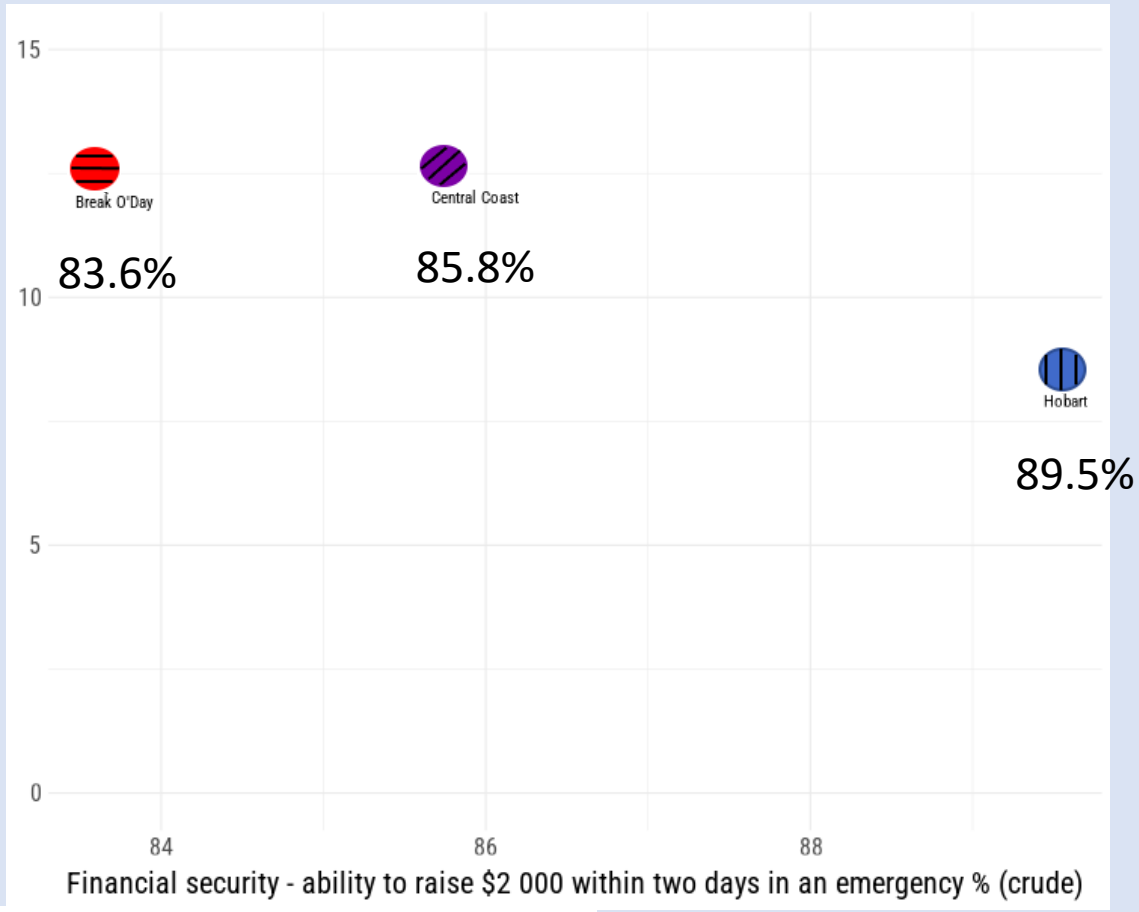
Inability to access GP



Financial security

Ability to raise $2000 within 2 days





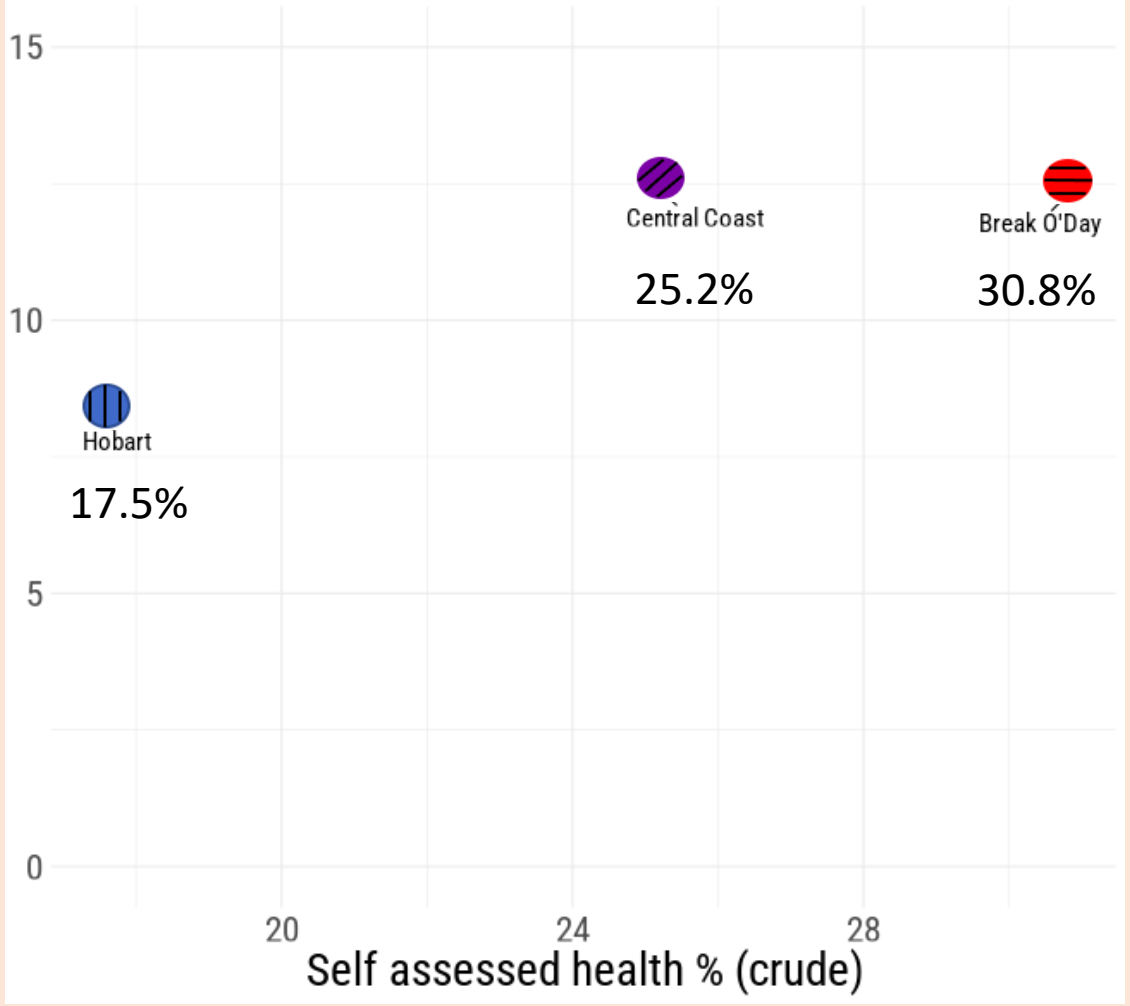
Tasmanian Population Health Survey self-reported data crude prevalence %

Results: Assessed Health

LGA	Hobart	Break O'Day	Central Coast
CKD.TASlink % CKD	8.3%	12.3%	12.4%

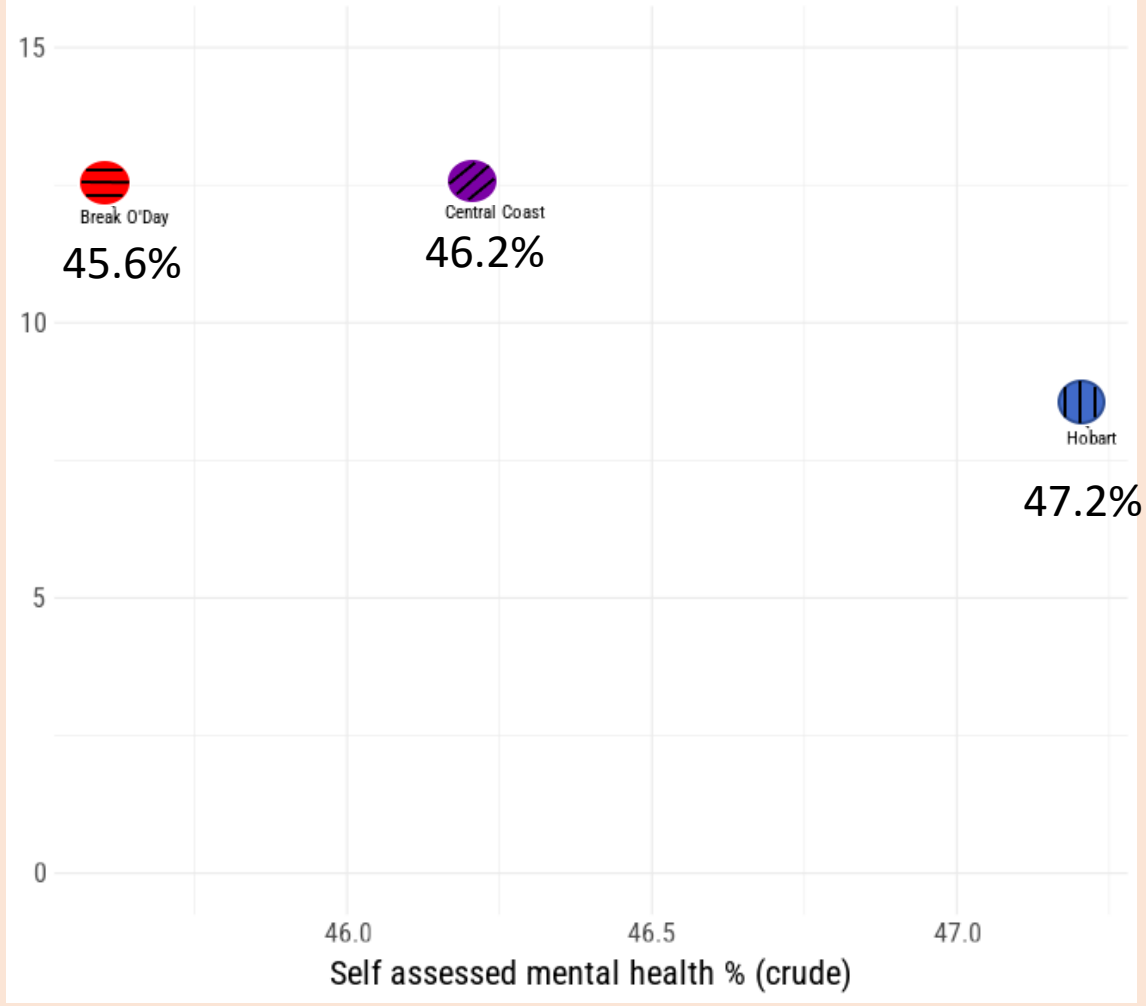
Assessment of Health

Poor



Assessment of Mental Health

Excellent



Tasmanian Population Health Survey self-reported data crude prevalence %

Strengths and Limitations

- Robust datasets
  - CKD.TASlink captures 88.4% of Tasmania
  - Tasmanian Population Health Survey captures population level data
- Ecological study design
  - Explores trends
  - Cannot prove causality
- Comparing different datasets with different data collection methodologies
  - Self reported vs measured
  - Usual tests of statistical significance challenging in this setting

Conclusion

- CKD is highly prevalent but often **under-recognised**
- The **most rural areas carry the greatest burden** of comorbidities, risk factors, and barriers to care
- Many risks are **modifiable**
  - Opportunity for intervention

Next Steps

- Strengthen CKD awareness & education
  - Improve Consumer Health Literacy through targeted kidney projects
  - Support health professional education through Primary Health Tasmania
- Working within local communities
  - Co-design local interventions of local importance
  - Collaboration with local primary care practices
- Improved access to tertiary care for rural patients
  - Advocate and expand telehealth nephrology clinics
  - Use of travel assistance and outreach models
- Ongoing CKD research
  - Effect of air quality from wood-burners
  - Other local environmental impacts (eg heavy metals)
  - Consumer group priorities for intervention

Acknowledgement

CKD.TASlink team
Matthew Jose[3,4]
Alex Kitsos[4]
Tim Saunder[4]
Jan Radford[7]
Kim Jose[5]
Rajesh Raj[6]
Laura Cuthbertson
Jessica Fraser[1]
Zena Barakat[2]
Hilary Hiscock[3]

Northern Tasmania
Mathew Mathew
Rajesh Raj
Duncan Cooke
Jay-Sen Gan

Southern Tasmania
Matthew Jose
Lee Skeat
Geoff Kirkland
Richard Yu
Steven Yew
Rachel Elliott

Tangri / KFRE equation
Georgie Irish
Phil Clayton

Motherhood & CKD
Shilpa Jesudason
Erandi Hewawasam

Primary Health Tasmania
Kellie Shaw
Faline Howes

CKD3 Consortium
Radwan Rahman Talukder
Paul Lawton
Gill Gorham
Asanga Abeyaratne
Alan Cass
Winnie Chen
Athira Rohit
Craig Nelson
Julia Jones

Affiliations

1. Launceston General Hospital, Launceston, Tasmania
2. Renal Unit, Monash Medical Centre, Clayton, Victoria
3. Renal Unit, Royal Hobart Hospital, Hobart, Tasmania
4. Tasmanian School of Medicine, University of Tasmania
5. Menzies Institute for Medical Research, Hobart, Tasmania
6. Renal Unit, Launceston General Hospital, Launceston, Tasmania
7. Launceston Clinical School, Tasmanian School of Medicine, University of Tasmania, Launceston, Tasmania