Chronic kidney disease Queensland CKD.QLD registry study and data linkage

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and on behalf of the CKD.QLD COLLABORATIVE

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Why study chronic kidney disease?

- **Background**
  - In 2017-18, 237,800 Australians, or 1% of the population, had kidney disease
  - In 2017, 13% of all deaths were certified where kidney disease was being a contributory factor
  - Hospitalisations for CKD as the principal diagnosis (excluding dialysis) have more than doubled between 2000–01 and 2020–21 from 24,200 to 58,200.
  - The age-standardised hospitalisation rate for CKD as a principal diagnosis rose by 64% between 2000–01 and 2020–21
  - It is essential to understand CKD in all its dimensions to predict its course, better manage the huge burden of premature deaths and delay the progression to ESKD

CKD.QLD Registry Study

- A multidisciplinary research and practice collaborative network embracing most of the renal units in the public health system in Queensland, under the jurisdiction of Queensland Health.

- concept developed in late 2009

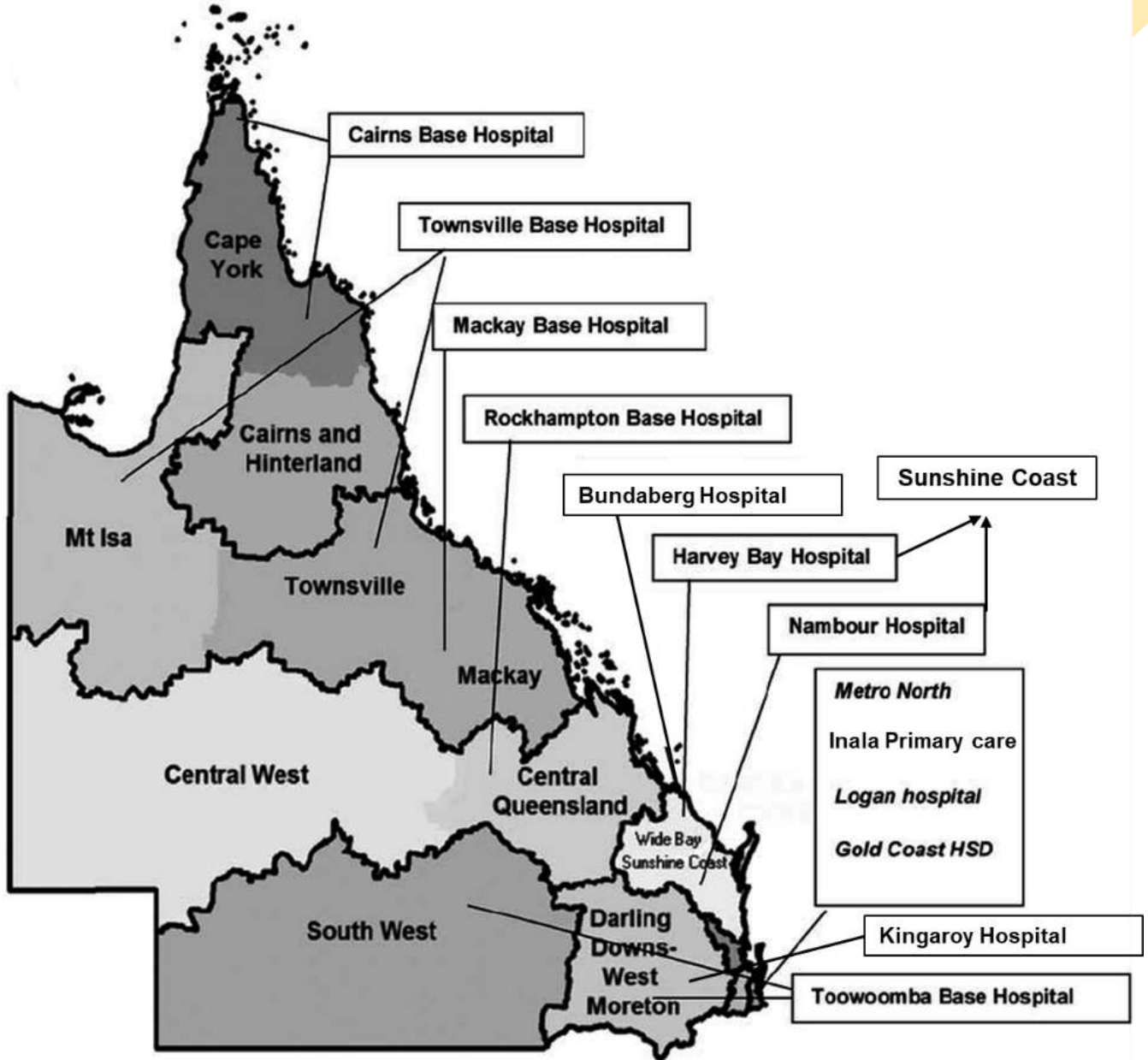
- first patient enrolment in May 2011 with informed consent

www.ckdqld.org

CKD.QLD: Sites in Queensland

Queensland population:

- 5 million
- Multi-ethnic
- Spread across metropolitan, regional, rural and remote/very remote



CKD.QLD: Mission and research streams

Entity

- The only CRE focused on CKD in Australia.

Mission

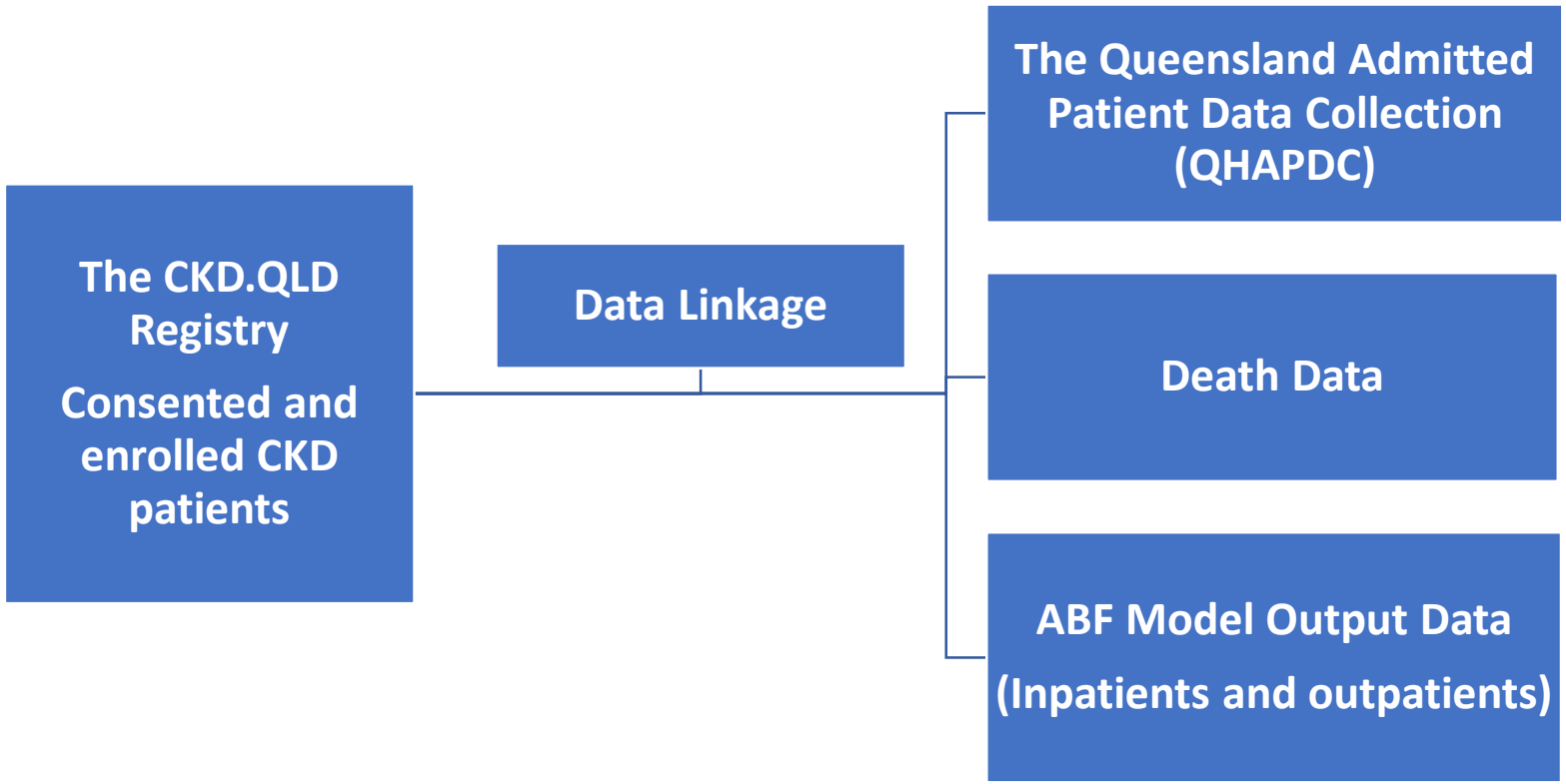
- To advance knowledge about CKD and its management across the health care spectrum, in order to improve outcomes, study the progression of CKD and find ways to delay the progression towards ESKD

Research streams

- CKD surveillance
- Practice improvement
- Biomarker research
- Health services utilization among CKD patients

Evaluation of health services utilisation, costs and outcomes of patients with chronic kidney disease, who are enrolled in the CKD.QLD Registry

How we do this:

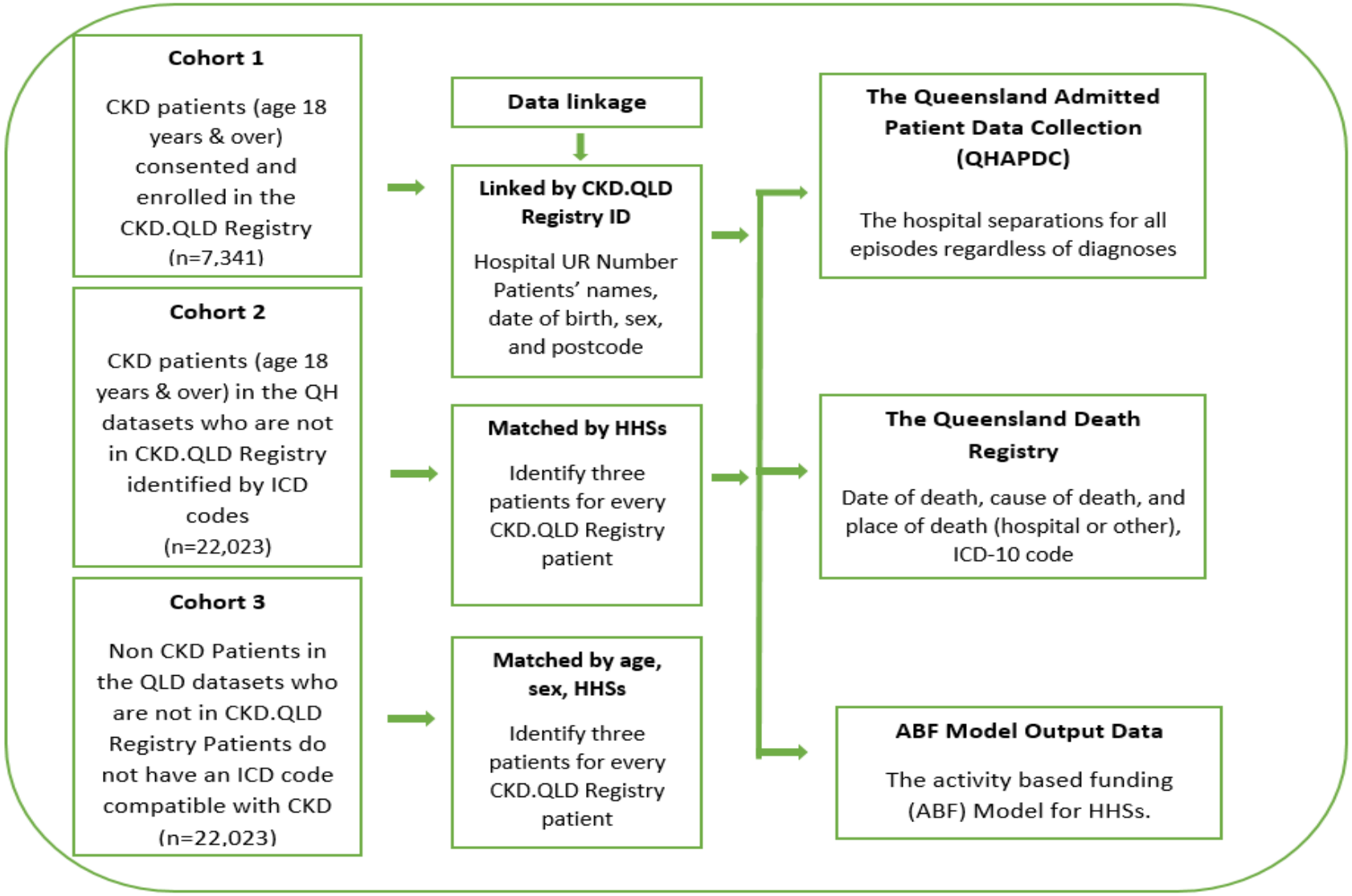


Capture all the hospitalisations to assess state-wide hospital utilisation

Evaluate all patient outcomes

Conduct a comprehensive health economic evaluation incorporating ABF Model Output data with the CKD.QLD Registry

The data linkage framework of the sub-study of CKD.QLD Registry



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Check for updates

DATA NOTE

The CKD.QLD data linkage framework: chronic kidney disease and health services utilisation in Queensland, Australia

Jianzhen Zhang [1,2], Zaimin Wang[1,2], Anne Cameron[1,2], P Marcin Sowa[2,3], Vishal Diwan[1,2], Sree Krishna Venuthurupalli[2,4], Helen G. Healy[2,5], Luke B Connelly [2,3,6], Wendy E Hoy[1,2]

Implications of the linkage project:

1. Access to all hospitalisations, not limited to renal admissions, and across all disciplines

- - Profile a “bigger picture” of health service utilisations
- - valuation of more in-depth longitudinal analyses and provide evidence base

2. Key outcomes of the Registry have informed, and are planned to continue to inform

- - CKD health practitioners
- - Queensland Health
- - National groups: eg. the Australian Institute of Health and Welfare (AIHW)
- - CKD patients

The findings

Persons with CKD were enrolled in the CKD.QLD Registry and followed until they started kidney replacement therapy (KRT), died with kidney failure without KRT, idea of other causes, or until a censor date of June 2020.

Queensland, Australia

Retrospective observational cohort study, 2011 - 2020

7,595 patients with CKD
12 public renal clinics

Association of clinical features with hospitalization, LOS, cost

LOS = length of stay, AUD = Australian dollars

59,794 hospital admissions

89% of patients admitted at least once

Cost per person year: $9525 AUD (>2x national average)

Admissions per person year: 1.7 admissions (10x national average)

	Admissions	Cost
1-day admissions	~60%	15%
> 1-day admissions	40%	85%
Emergency admissions	~40%	~48%
Readmission within 30-days	~44%	47.5%
Not related to CKD diagnosis	89%	91%

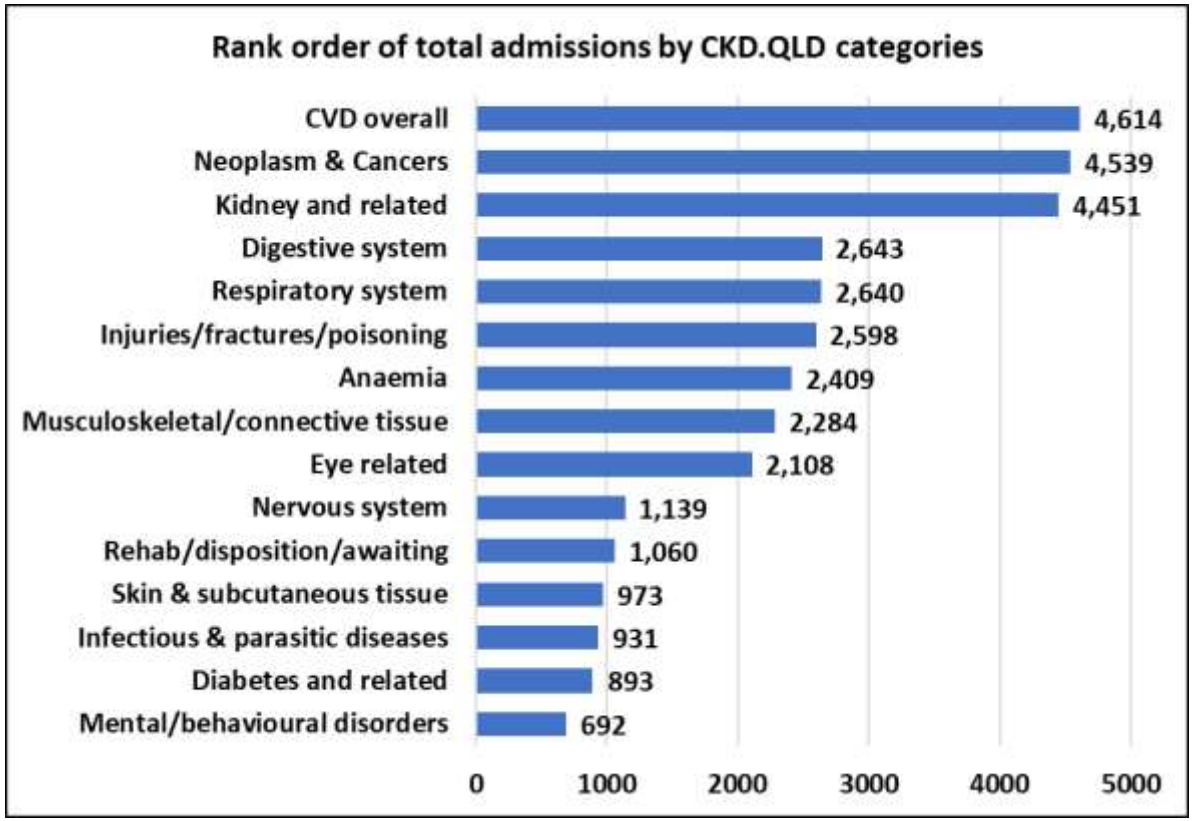
Top > 1-day admissions:

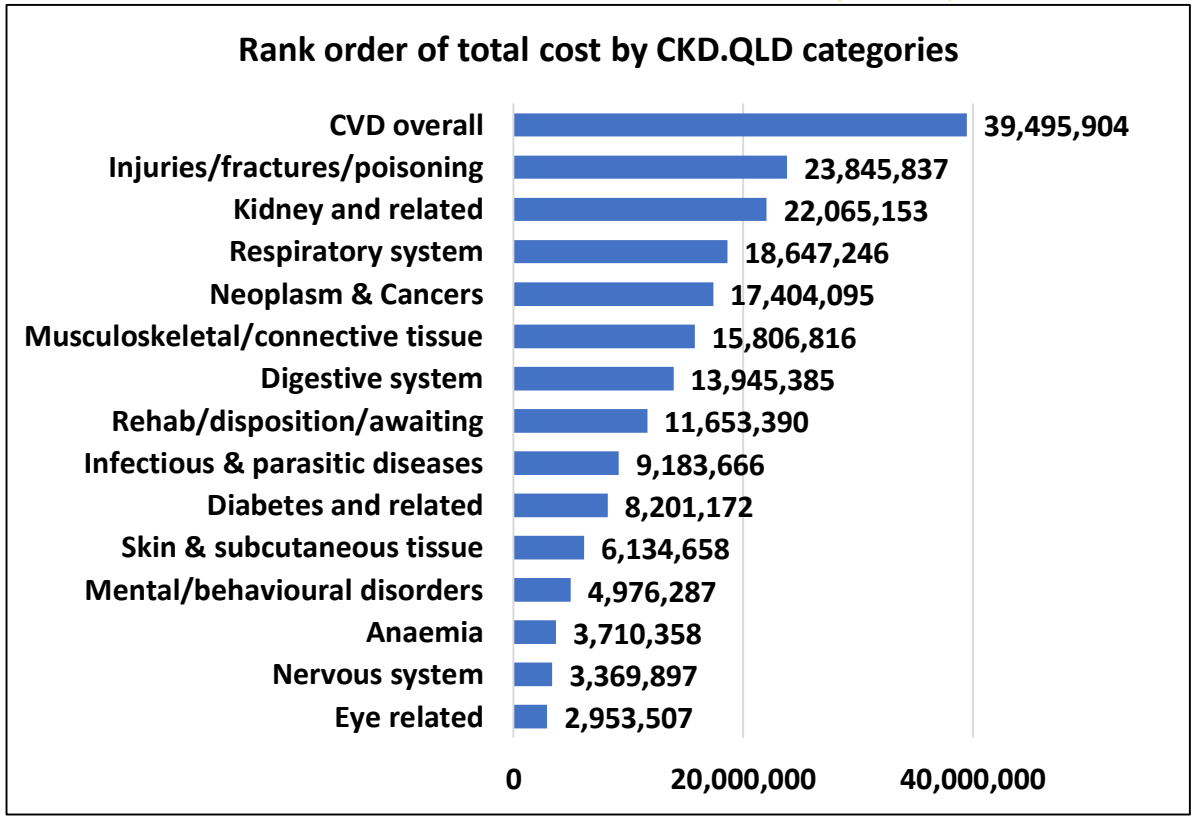
- Cardiovascular
- Respiratory
- CKD-related

Top 1-day admissions:

- Neoplasms (chemotherapy)
- Anemia
- CKD-related

Pattern of hospital admissions and costs





Original Research

Kidney Medicine

Hospitalizations Among Adults With CKD in Public Renal Specialty Practices: A Retrospective Study From Queensland, Australia

Vishal Diwan, Wendy E. Hoy, Zaimin Wang, Jianzhen Zhang, PhD, Anne Cameron, RN, Sree K. Venuthurupalli, Robert G. Fassett, Samuel Chan, Helen G. Healy, Ken-Soon Tan, Richard Baer, Andrew J. Mallett, Nicholas Gray, Murty Mantha, Roy Cherian, Clyson Mutatiri, Krishan Madhan, George Kan, Geoffrey Mitchell, Shahadat Hossain, Danielle Wu, Thin Han, Adrian Kark, Thomas Titus, Dwarakanatan Ranganathan, Ann Bonner, and Sridevi Govindarajulu, on behalf of the NHMRC CKD.CRE and the CKD.QLD Collaborative

| Further evaluation |

Comparison: Indigenous vs Non-Indigenous

Indigenous patients, per person year of follow up, had

- **9%** more hospital admissions
- **16%** greater length of stay
- **36%** greater costs

Indigenous patients, per 100-person year, had higher incidence rate

- **ESKD** 8.8 vs 5.2
- **KRT** 5.7 vs 2.7

Comparison: Indigenous vs Non-Indigenous

	Per 100 person years			
	Admissions		Cost	
	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
All admissions	181.7	165.9	1,260,070	931,648
>1-day admissions	84.7	66.1	1,082,421	787,857
ED admissions	90.7	64.4	681,677	434,370
All readmissions	77.9	72.5	669,283	443,357
>1-day readmissions	39.2	29.7	607,313	389,435

Hospital admissions: principal diagnosis

Non-Indigenous **Indigenous**

ICD chapters	Non-Indigenous	% by total admissions among non-Indigenous	Indigenous	% by total admissions among Indigenous	P values
9: Circulatory system	4,813	12.7	364	13.6	0.181
18: Abnormal clinical/laboratory findings	3,238	8.5	272	10.1	0.005
14: Kidney & genitourinary system	2,864	7.6	249	9.3	0.002
10: Respiratory system	2,291	6.0	244	9.1	0.000
21: Factors influencing health status	4,966	13.1	235	8.7	0.000
4: Endocrine, nutritional & metabolic	2,039	5.4	223	8.3	0.000

Incidence rate of end points by Indigenous status

	Indigenous	Non-Indigenous	P
All ESKD	10.9 (9.2-12.5)	7.8 (7.4-8.2)	P<0000, RR, 1.39
KRT	4.9 (4.1-5.9)	2.2 (2.0-2.3)	P<0.0001, RR 2.24
Renal death	3.0 (2.4-3.8)	3.1 (2.9-3.3)	P=0.782, RR 0.967
Nonrenal death	1.73 (1.3-2.3)	2.66 (2.48-2,83)	P=0.0065, RR 0.65

Findings will be published

Equity and Chronic Kidney Disease (CKD) in Indigenous adults in Public Renal Specialty Services in the Australian state of Queensland, a CKD.QLD registry study.

Diabetes minimises female protection among Indigenous Australian females against ESKD: A CKD.QLD registry study.

List of Authors and affiliations

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Future perspectives:

Post marketing surveillance: Newer classes of medicines for control of weight, diabetes, and cardiovascular and renal protection:-

- Sodium-glucose Cotransporter-2 (SGLT2) inhibitors
- Glucagon-Like Peptide-1 (GLP-1) inhibitors
- newer mineralocorticoid inhibitors
- Dipeptidyl peptidase-4 (DPP-4) inhibitors

Comparison of hospitalisation before and after KRT:

- Changes in pattern (1-day, >1-day, readmissions, ED admissions)
- Changes in reason of hospitalisations

Acknowledgements

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