

# CKD.CRE: Surveillance Stream

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# Surveillance



## **CKD.QLD**

Core work of CKD.QLD

Linkage project with QHealth, underway, Dr Jenny Zhang

Linkage work with ANZDATA, beginning, Dr Odewumi Adegboja

ACQUIRE projects: Hoy. Mallett, Keary, underway: Prof Glenda Gobe

## **Surveillance beyond Queensland**

National CKD Surveillance Network

Audit 4

## **Chronic kidney disease of unknown etiology**

### **The kidney emergency of the century**

Sri Lanka

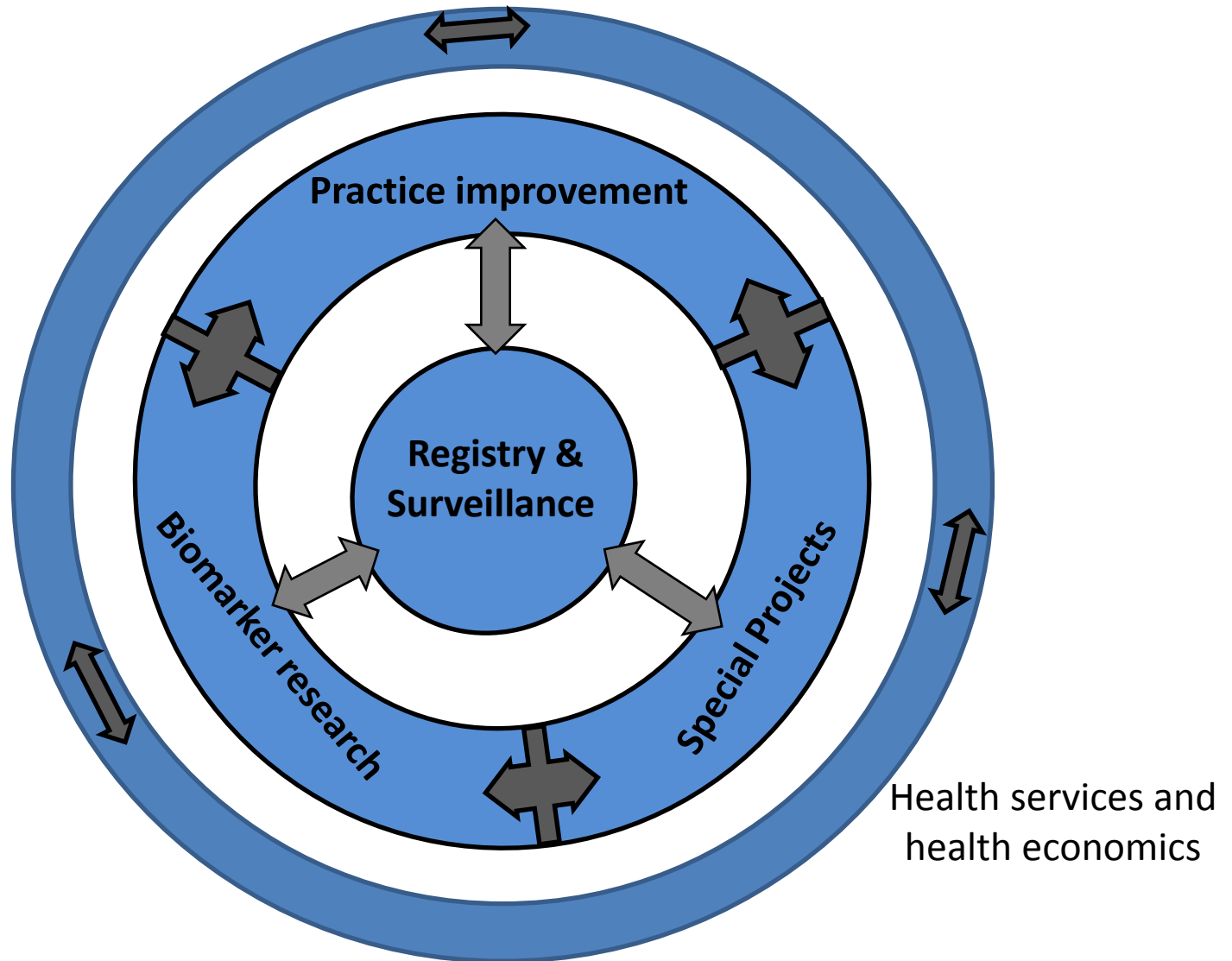
Central America

Australia

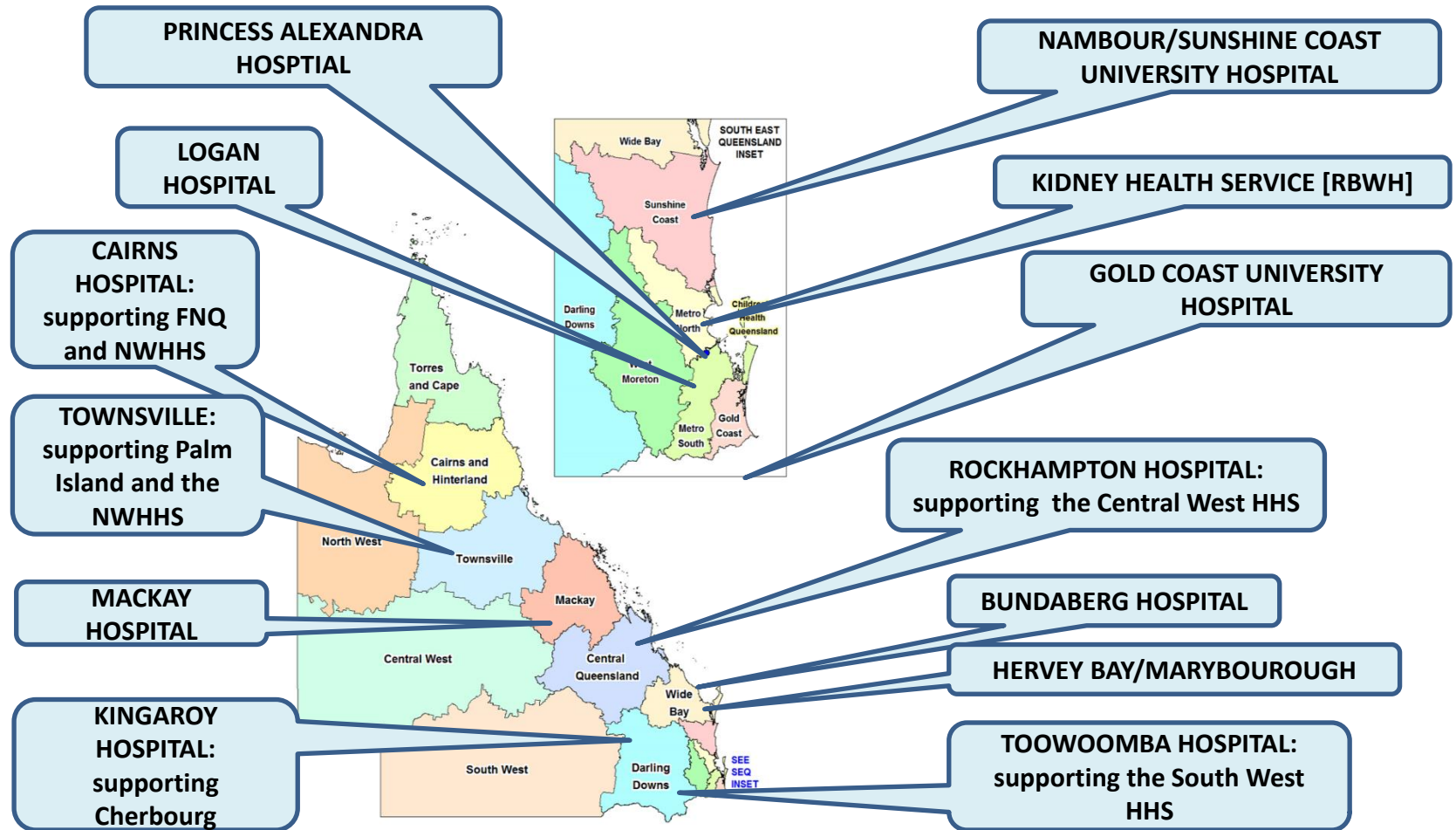
## What is CKD.QLD?

- CKD.QLD is a CKD research and practice improvement platform based in the public renal speciality practices of Queensland Health.
- It is the only systematic statewide CKD surveillance system in Australia
- All 14 HHS are participating, and their professional staff all have the option of being investigators in CKD.QLD.
- A registry of CKD patients in central, with its purpose to characterise CKD patients and follow their course. Patient enrollment, which is by informed consent, began in 2011.
- The major institutional partners are UQ, QUT and Queensland Health.
- The major sponsors have been the Colonial Foundation, Amgen, and since 2016, the CKD.CRE.

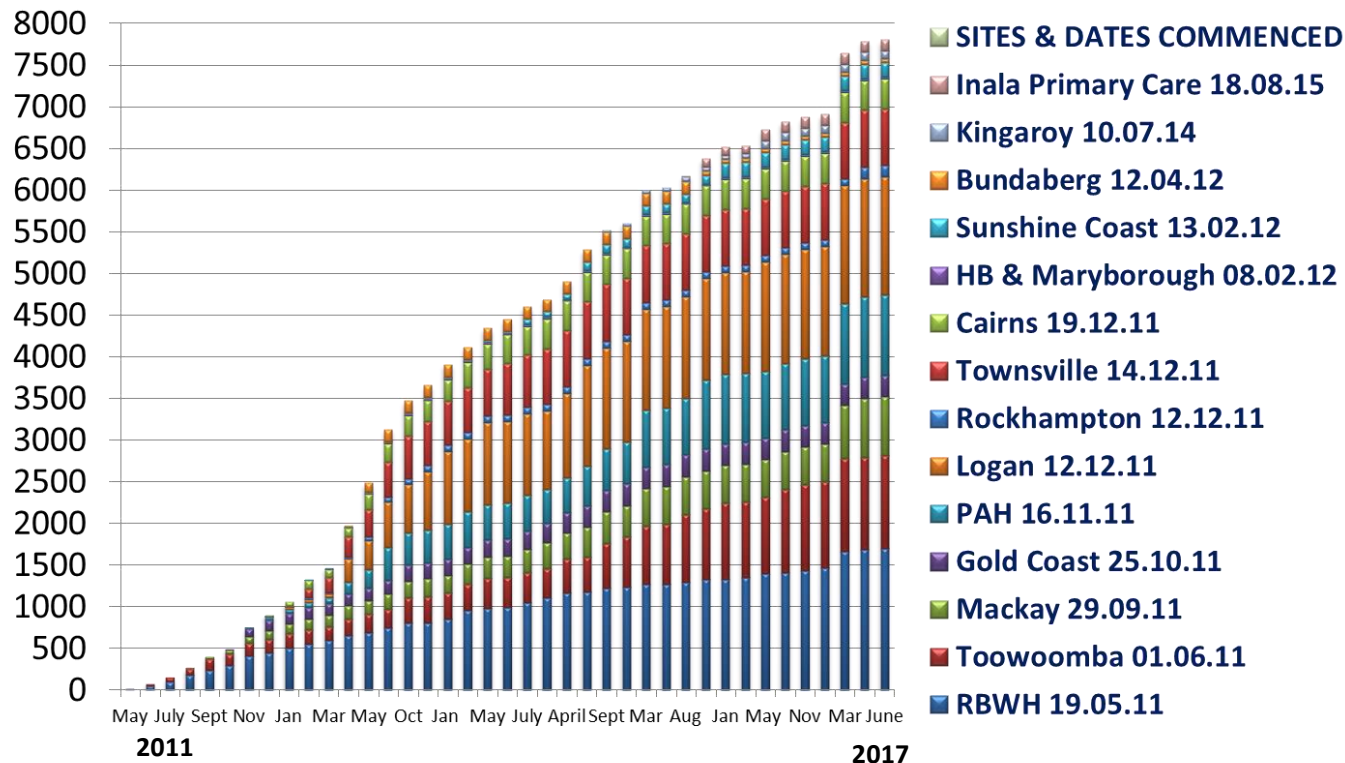
# CKD.CRE Research and Practice Platform



# Queensland Health Renal Services by Hospital and Health Service Area (HHS), and affiliated with CKD.QLD

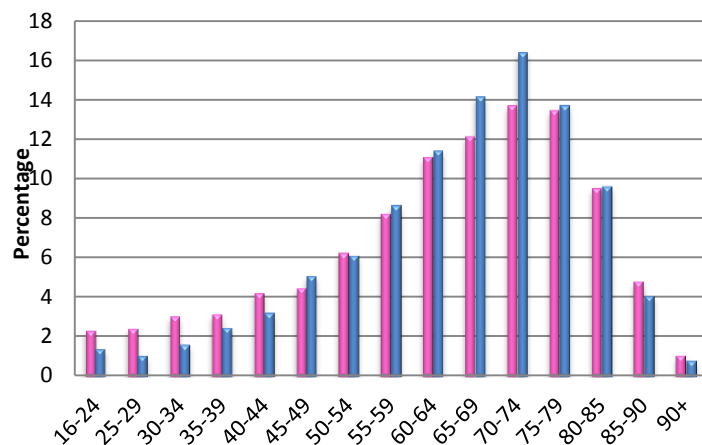


## Enrolment with consent to CKD.QLD Registry [7,804]. Active and Inactive

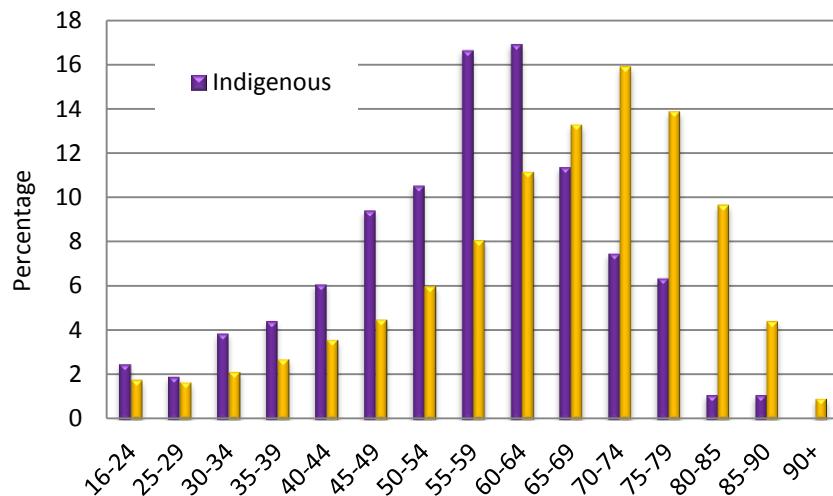


And about 40,000 person years of longitudinal observation  
 Hundreds of people have started RRT and hundreds have died without RRT  
 Data on CKD progressions are currently available in >6,000

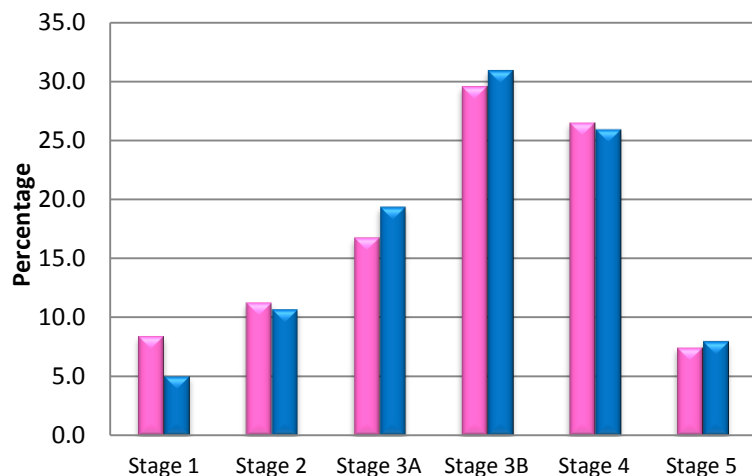
Age distribution (by gender) at consent.  
[female =2,719, male = 3,216; F:M 46:54]



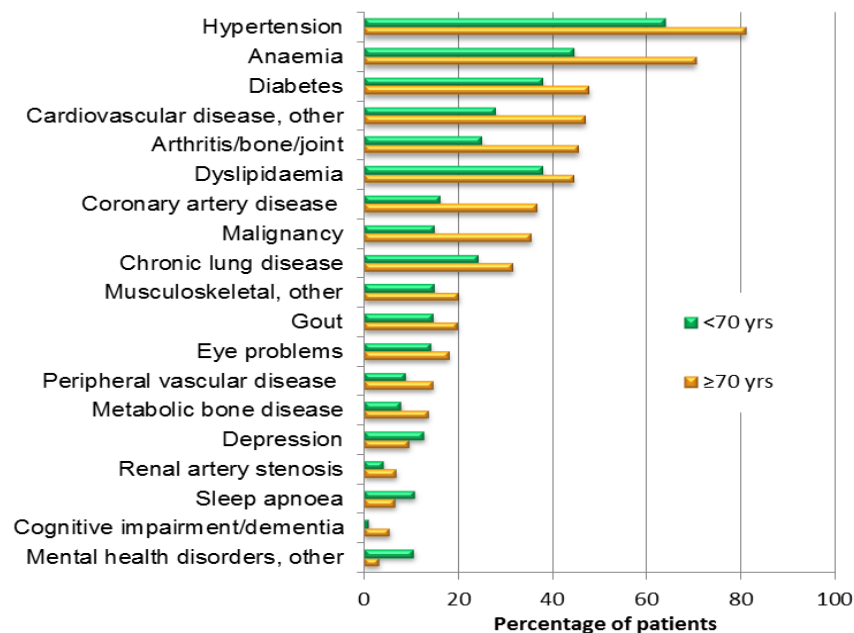
Age distribution in CKD patients, Indigenous vs nonindigenous in Townsville.



CKD Stage by gender at consent, female=2,703, male n=3,200

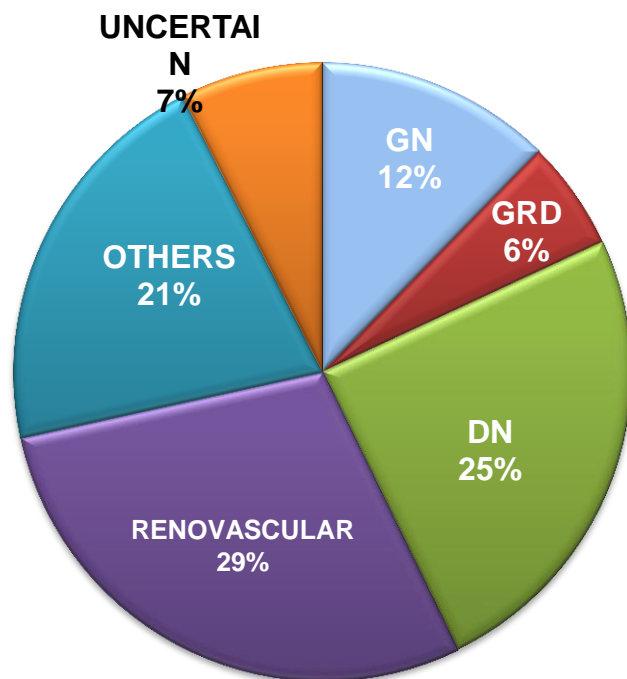


Comorbidities by age group



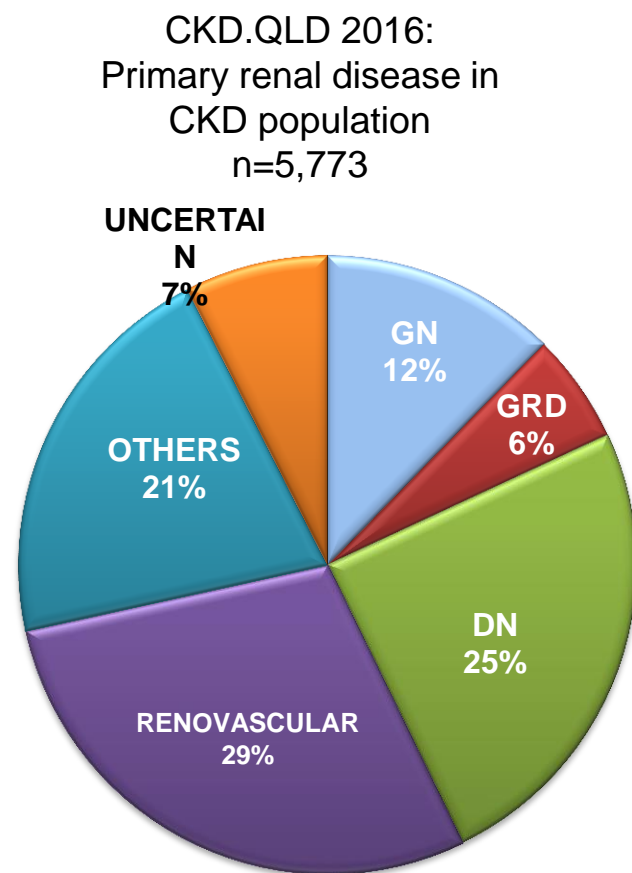
## Primary renal diagnosis among CKD.QLD patients

CKD.QLD 2016:  
Primary renal disease in  
CKD population  
n=5,773



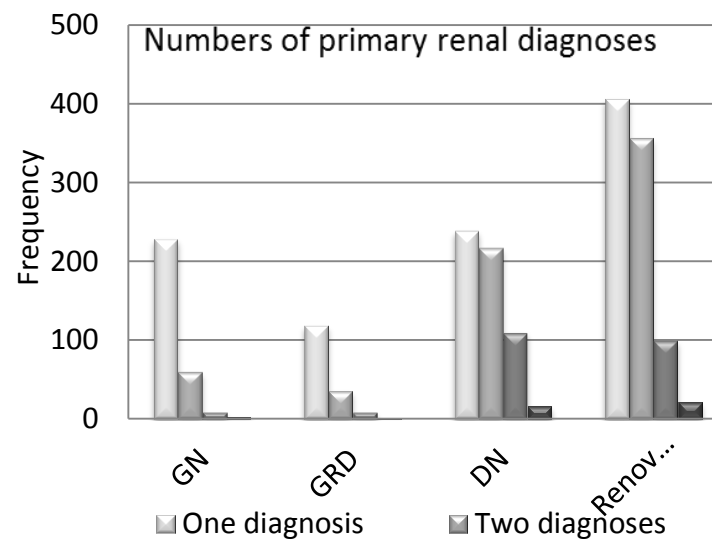
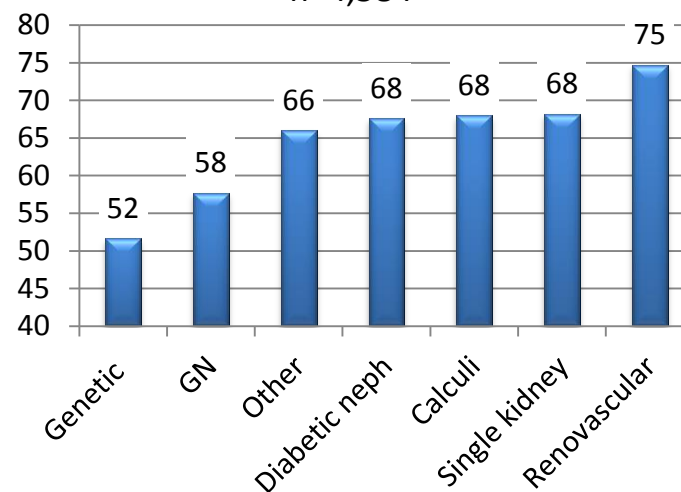
Mean age 71 years, 52% male

## Primary renal diagnosis among CKD.QLD patients



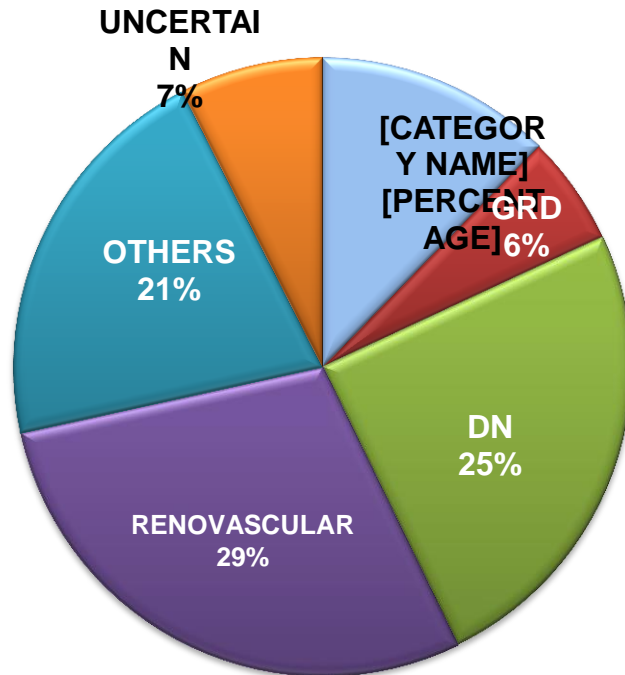
Mean age 71 years, 52% male

Median age by primary renal diagnosis,  
n=4,584



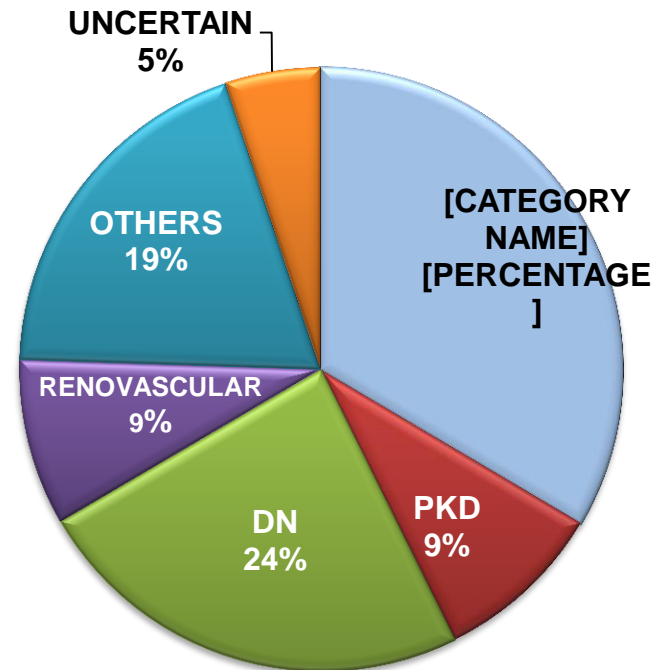
Patients who go onto renal replacement therapy (RRT)  
are a selected subset of those with preterminal CKD

CKD.QLD 2016:  
Primary renal disease in  
CKD population  
n=5,773



Mean age 71 years, 52% male

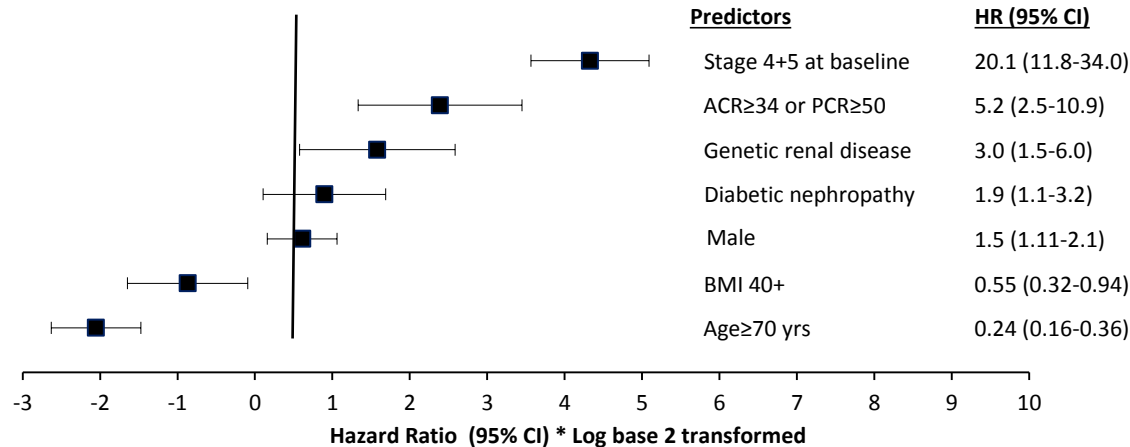
ANZDATA 2014:  
Primary renal disease in  
Australian RRT population.  
n=22,234



Mean age start of RRT, 64 years, 62% male

## Independent predictors of RRT in CKD patients

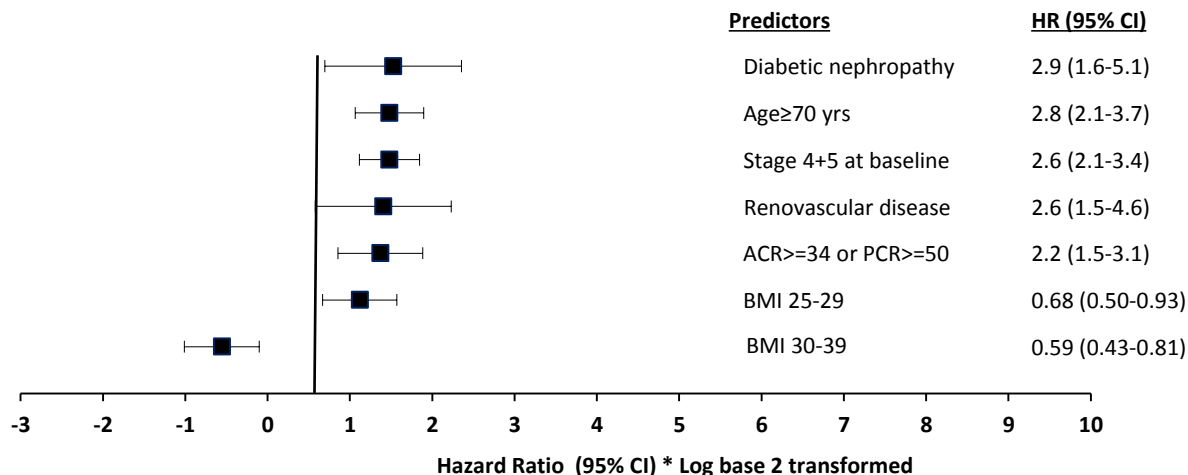
RBWH, Logan and Toowoomba combined, total patients=2,537, RRT =176



Referent groups: stages 4+5, vs lower; ACR≥34 or PCR≥50 vs ACR<3.4, PCR<15; GRD vs GN; diabetic nephropathy vs GN; male vs female: BMI 40+ vs BMI<25; age 70+ vs <70 yr

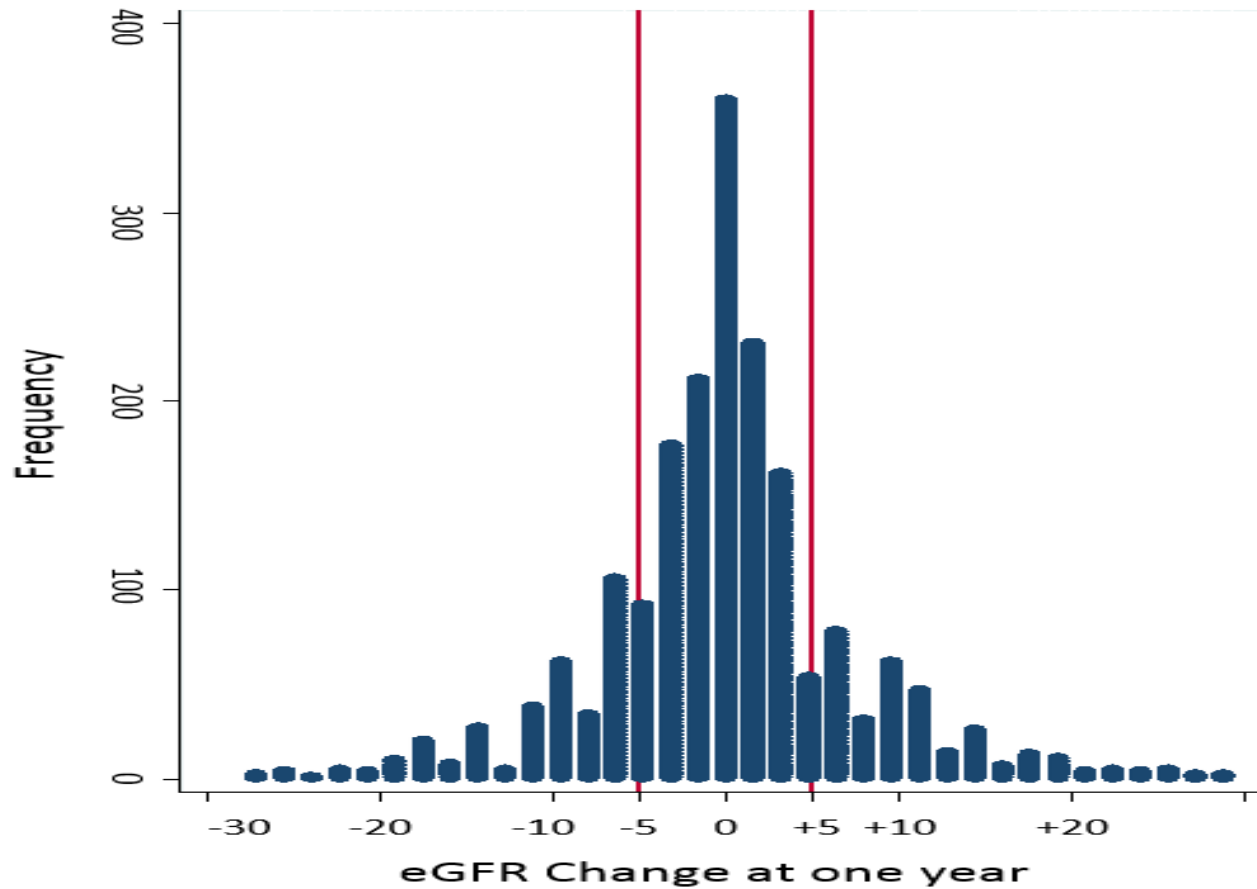
## Independent predictors of death without RRT in CKD patients,

RBWH, Logan and Toowoomba combined, total patients 2,537, deaths=282

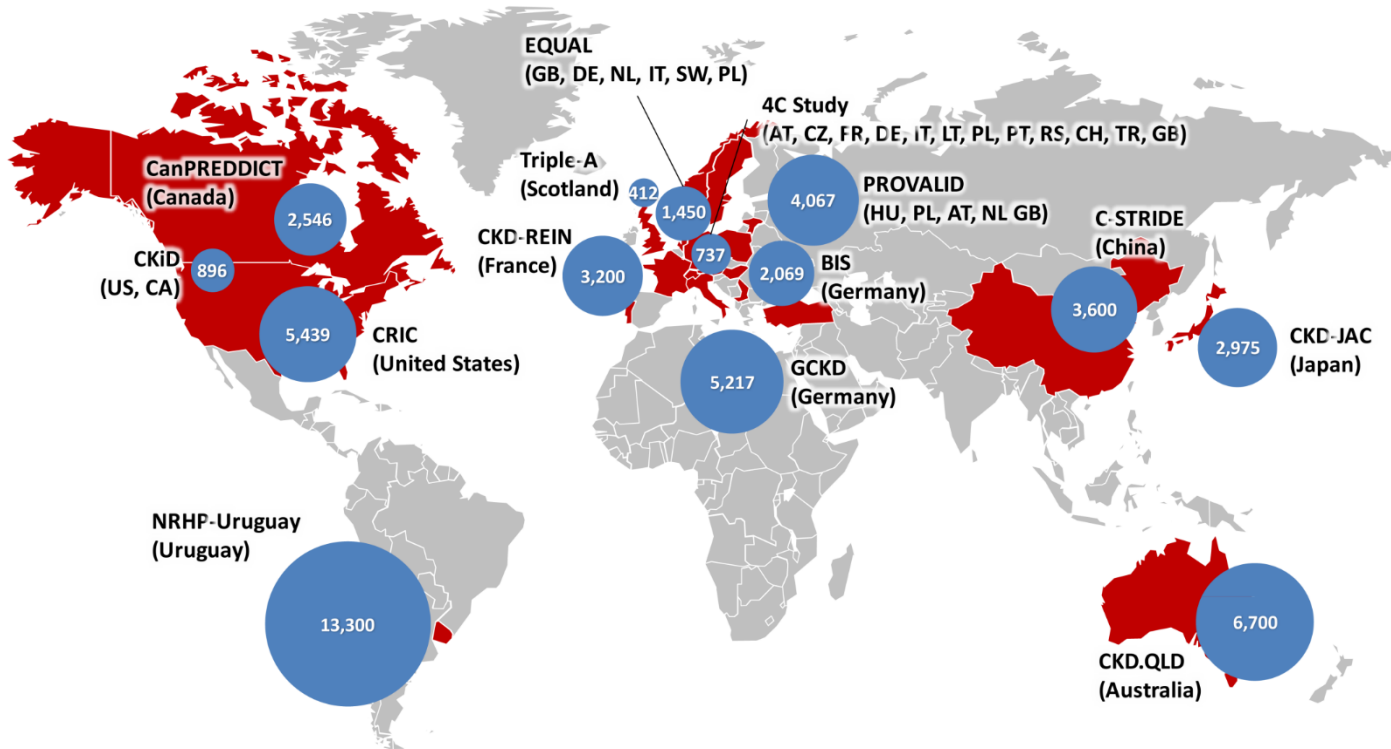


Referent groups: diabetic nephropathy vs GN; age 70+ vs <70 yr; stages 4+5 vs lower; renovascular disease vs GN; ACR≥34 or PCR≥50 vs ACR<3.4 or PCR<15; BMI 25-29 vs lower; BMI 30-39 vs lower

## Annual changes in EGFR per year, n=1,945

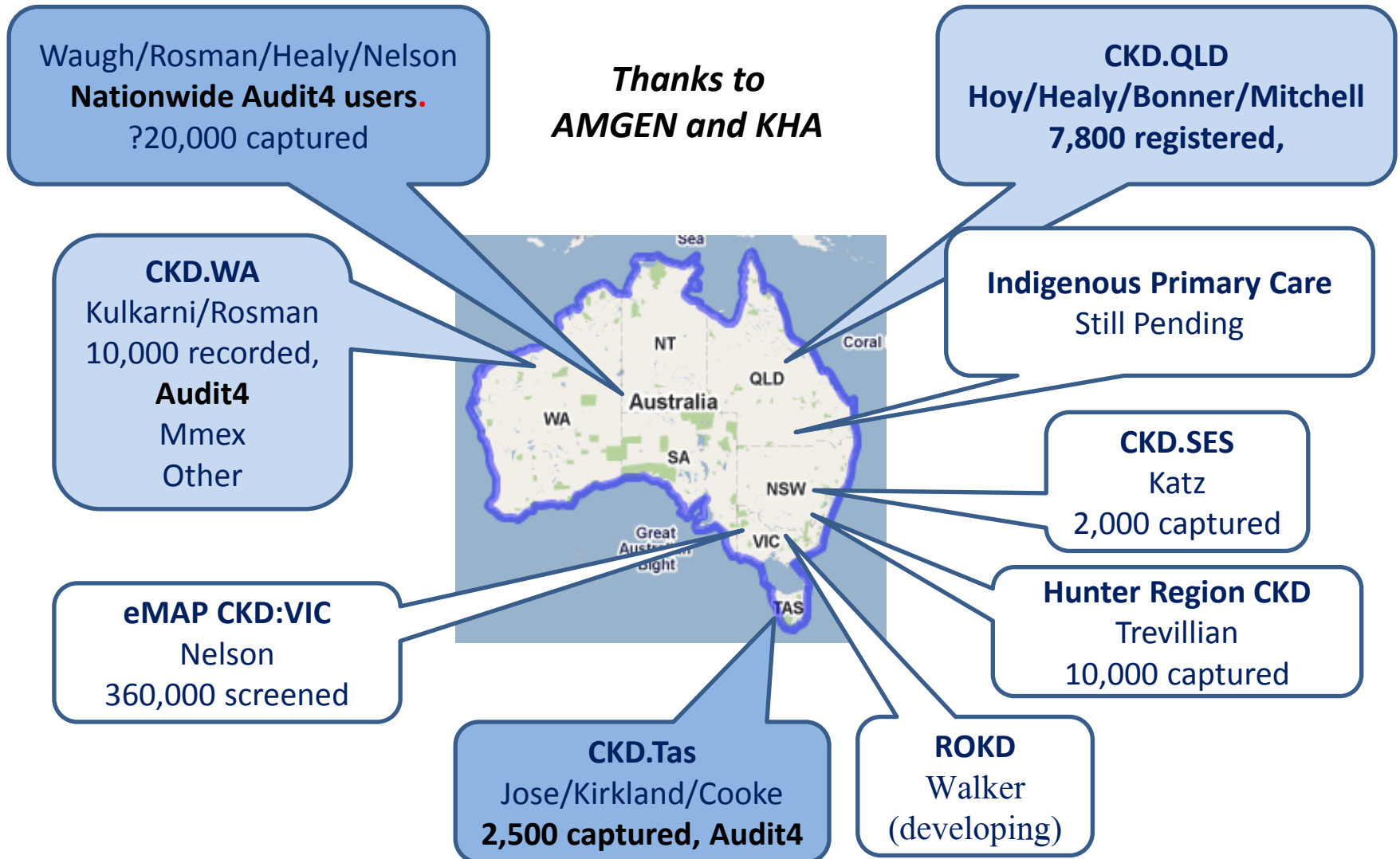


## Participating studies in iNET-CKD.



**ABBREVIATIONS:** AT, Austria; CA, Canada; CH, Switzerland; CZ, Czech Republic; DE, Germany; FR, France; GB, United Kingdom; HU, Hungary; IT, Italy; LT, Lithuania; NL, Netherlands; PL, Poland; PT, Portugal; RS, Serbia; SW, Sweden; TR, Turkey; US, United States;

# National CKD Surveillance Network, using data and systems already in place



# Audit 4: by S4S, ICD based system

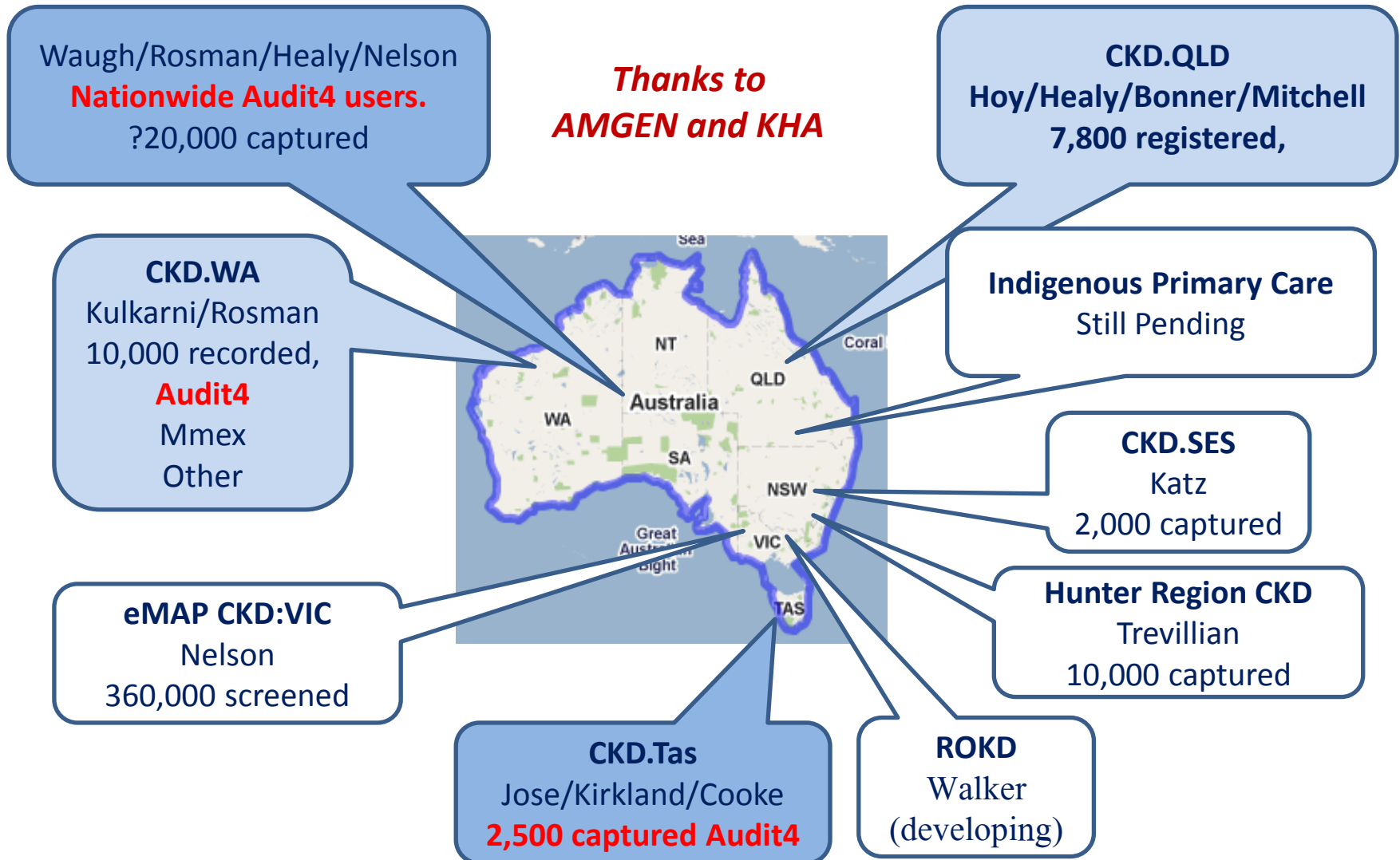
## Data abstraction tool

- Conceived by National Surveillance Network Group
- Produced by S4S
- Under contract to CKD.QLD/CKD.CRE
- Funded by Amgen
- Applied in practice records of Dr David Waugh in Sydney, NSW, n=3,905 patients, n=9,022 visits



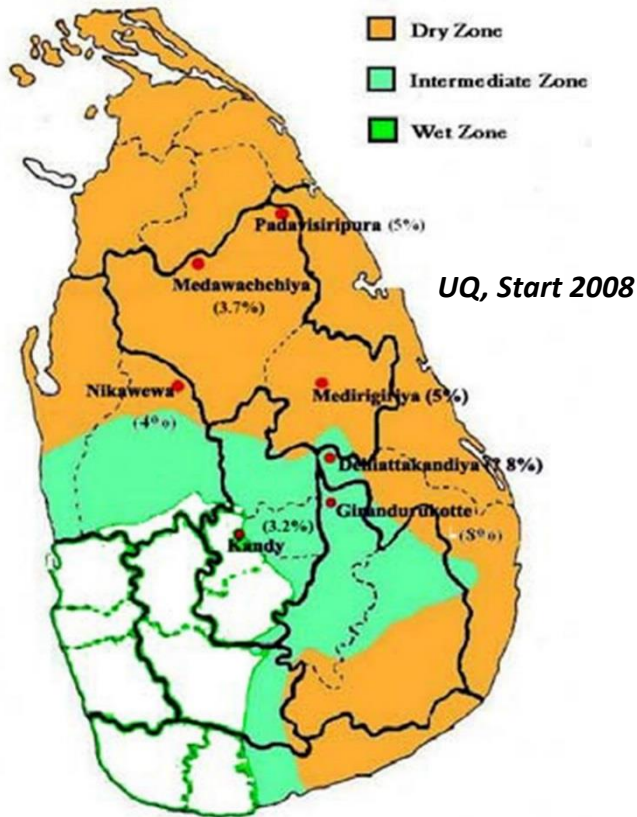
- Tool for data abstraction supplied free to all Audit4 user.
- Syntax for data analyses will be available through CKD.QLD

# National CKD Surveillance Network, using data and systems already in place



# CKD of unknown etiology

## The kidney disease crisis of our time

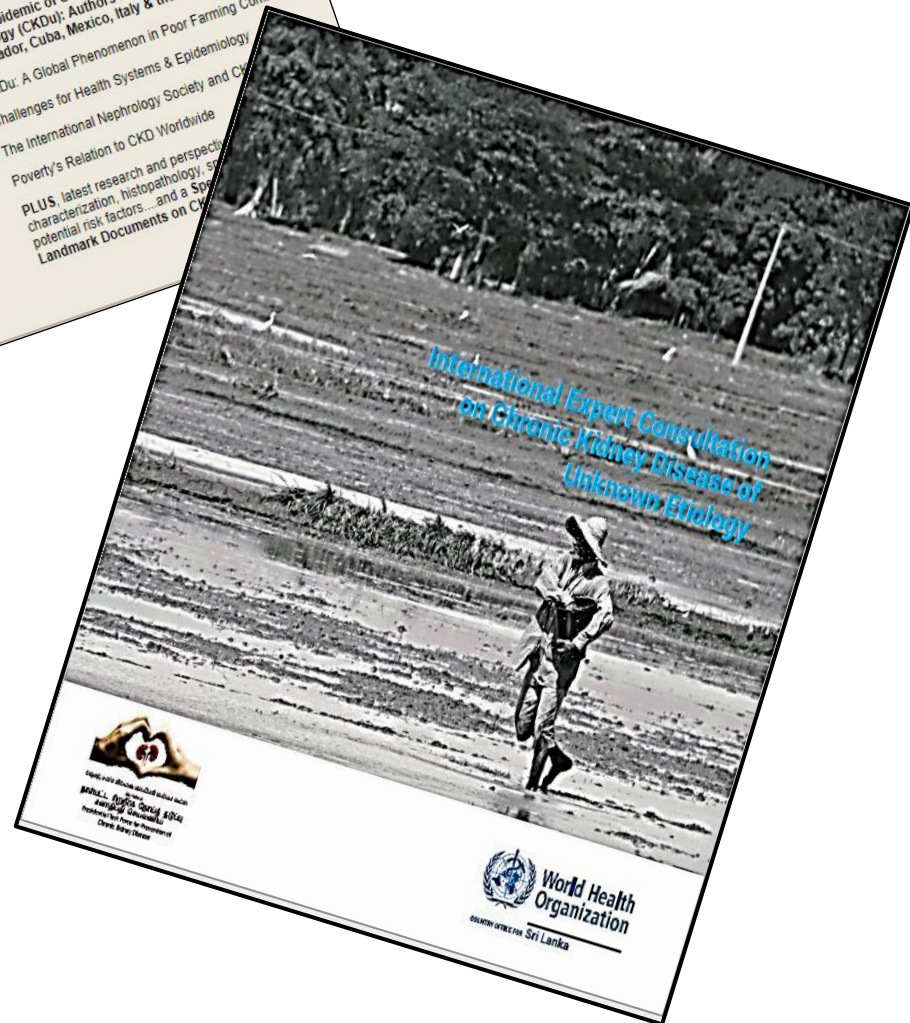
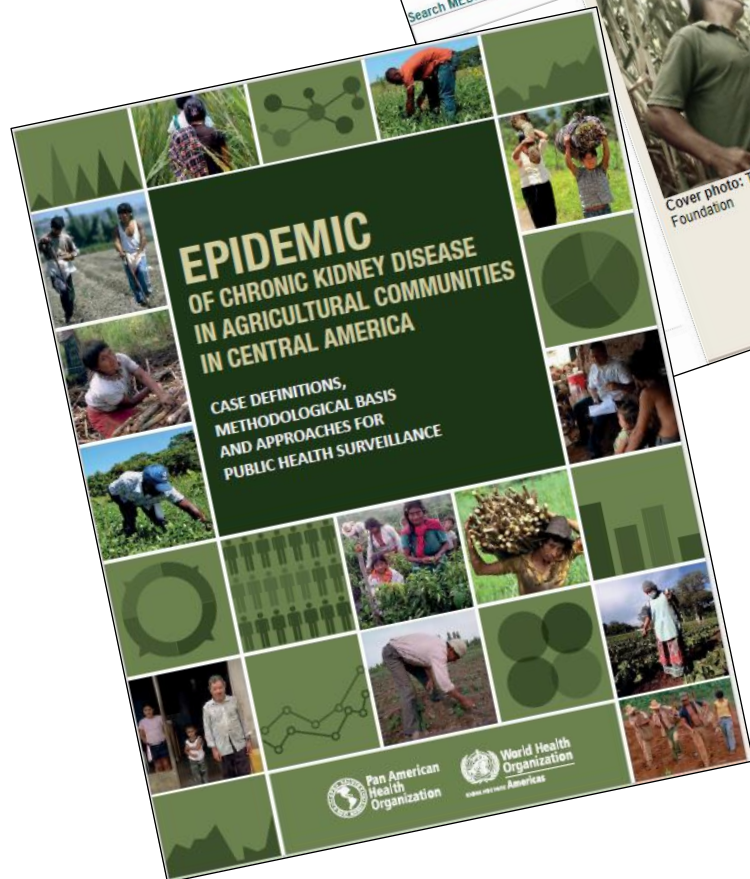
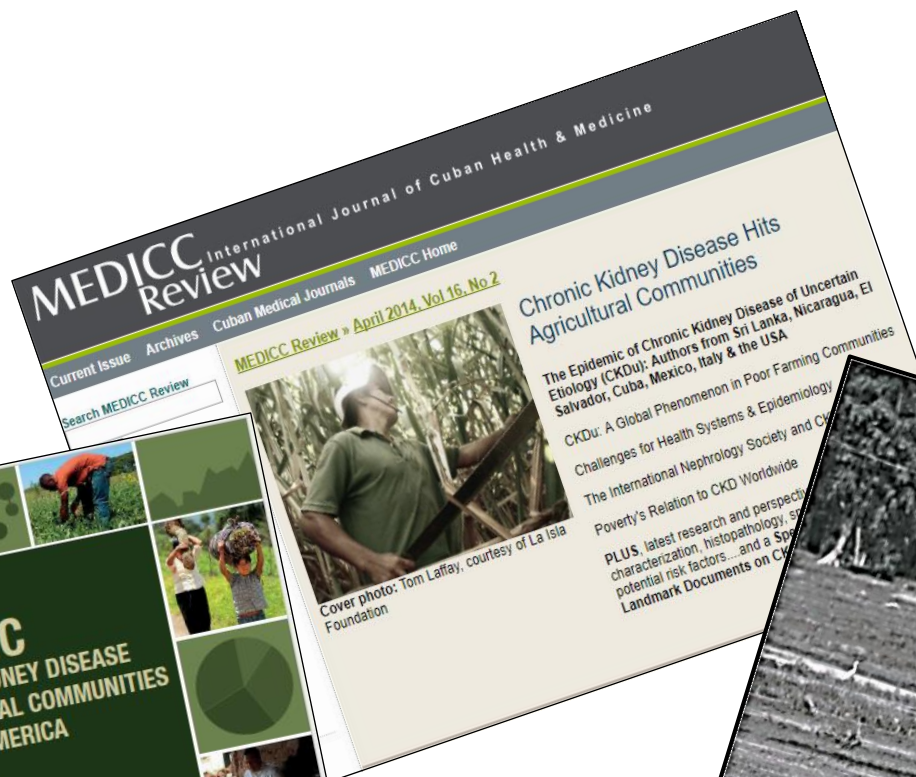


20 million people, one government  
But also India, Egypt, Tunisia,



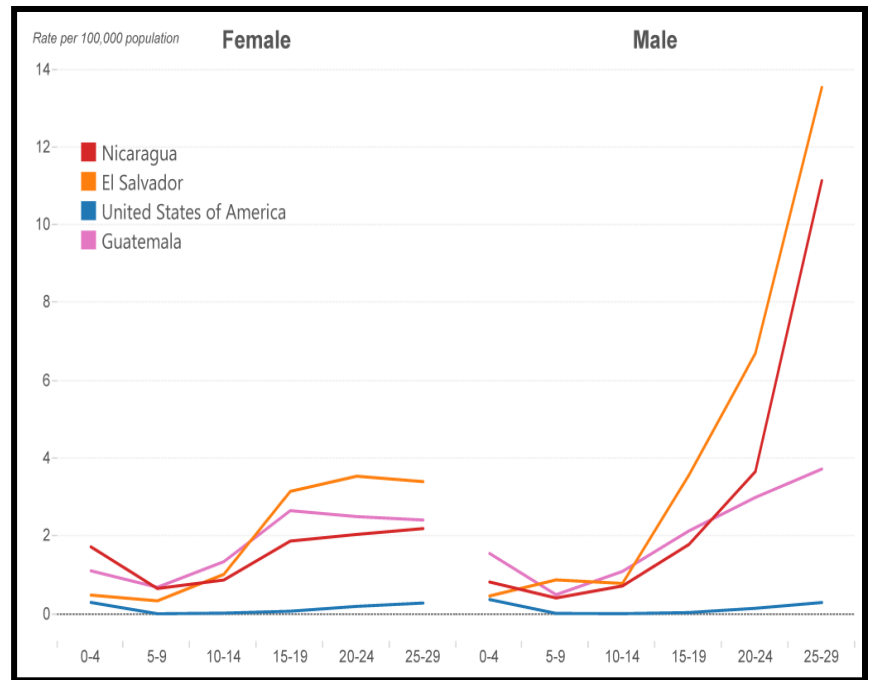
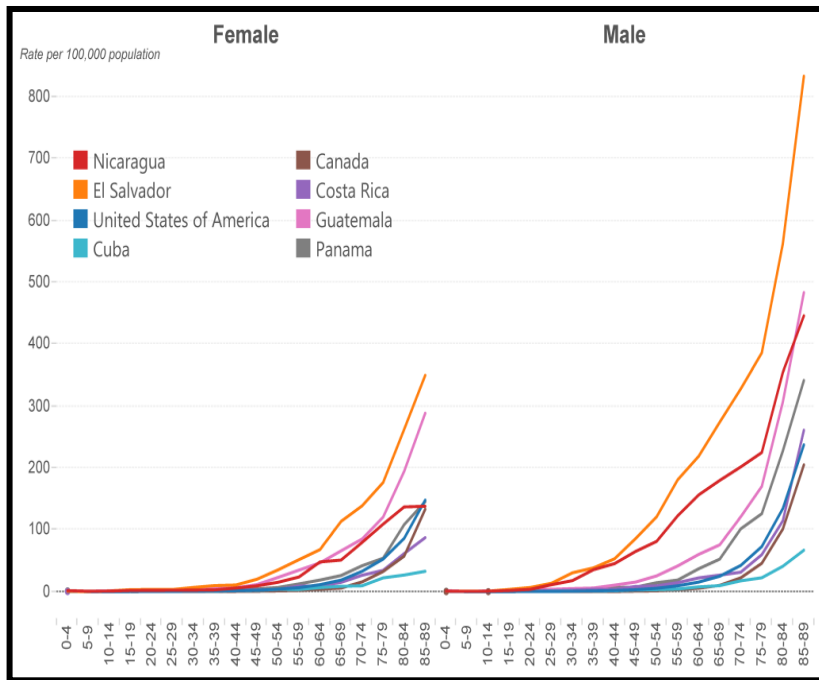
43 million: seven governments

But also Brazil, Argentina, Peru, Mexico, migrant workers in California



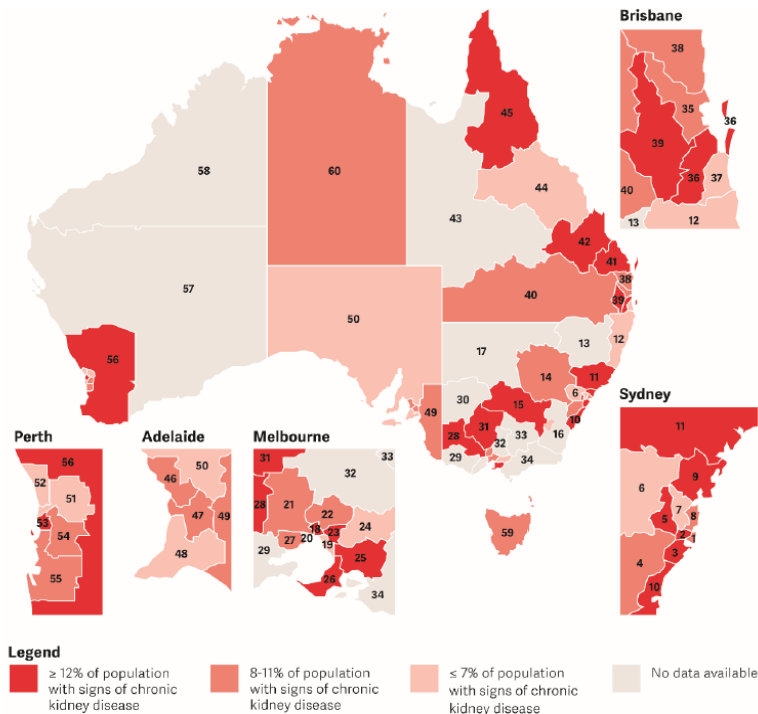
NHMRC Chronic Kidney Disease  
Centre of Research Excellence

# Kidney death rates by age group, 2010-2012, PAHO Data



# Is there CKDu in Australia?

Rates of CKD across Australia, 2011, AHS



Rates of RRT in Indigenous people across Australia, Cass et al, 2001

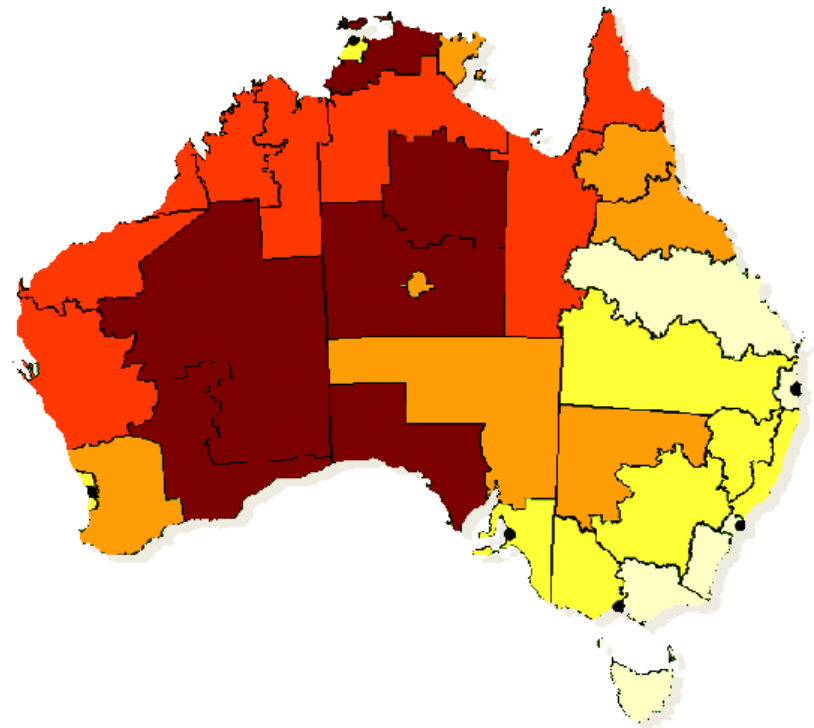
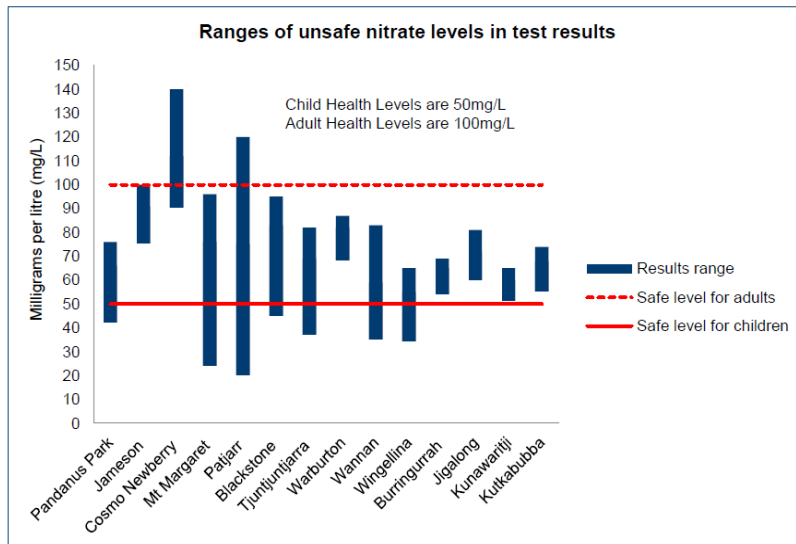


Table 12 Health related variables

Goldfields and Agricultural	Health related variables															
Locality	Nitrate					Pesticides		Radiological		Trihalomethanes					Other Health Related	
	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Guideline Met	Samples Taken	Guideline Met	Samples Taken	Concentration (mg/L)			Guideline Met	Samples Taken	Requirement Met
		Min	Max	Mean							Min	Max	Mean			
Avon Hills	6	<0.05	0.1	0.1	✓	3	✓	0	(1)	6	0.009	0.017	0.013	✓	1	✓
Ballidu	2	0.3	0.7	0.5	✓	1	✓	1	✓	2	0.028	0.048	0.038	✓	1	✓
Beacon	2	0.7	0.8	0.8	✓	1	✓	0	(1)	2	0.007	0.010	0.009	✓	2	✓
Bencubbin	2	0.2	0.4	0.3	✓	1	✓	0	(1)	4	0.001	0.005	0.003	✓	1	✓
Beverley	2	0.1	0.1	0.1	✓	1	✓	1	✓	2	0.010	0.069	0.040	✓	0	(1)
Bind Bind	2	0.5	0.6	0.6	✓	1	✓	0	(1)	2	0.047	0.055	0.051	✓	1	✓
Broad Arrow	2	0.3	0.6	0.4	✓	1	✓	0	(1)	2	0.076	0.120	0.098	✓	0	(1)
Bruce Rock	2	0.4	1	0.7	✓	1	✓	0	(1)	2	0.029	0.044	0.037	✓	0	(1)
Bullfinch	2	1.1	1.2	1.2	✓	1	✓	0	(1)	2	0.012	0.029	0.021	✓	0	(1)
Buntine	2	0.9	1.4	1.1	✓	1	✓	0	(1)	2	0.083	0.089	0.086	✓	1	✓
Cadoux	2	0.2	0.2	0.2	✓	1	✓	0	(1)	2	0.007	0.014	0.011	✓	1	✓
Coolgardie	2	0.2	0.8	0.5	✓	1	✓	0	(1)	2	0.015	0.069	0.042	✓	1	✓
Corrigin	2	0.2	0.5	0.4	✓	1	✓	0	(1)	2	<0.001	0.005	0.003	✓	0	(1)
Cunderdin	2	0.1	0.1	0.1	✓	1	✓	0	(1)	2	0.009	0.011	0.010	✓	1	✓
Dalwallinu	2	0.7	0.7	0.7	✓	1	✓	0	(1)	2	0.009	0.017	0.013	✓	1	✓
Dowerin	2	0.2	0.3	0.2	✓	1	✓	0	(1)	2	0.008	0.011	0.010	✓	1	✓
Goomalling	2	0.1	0.3	0.2	✓	1	✓	0	(1)	2	0.013	0.015	0.014	✓	1	✓
Grass Valley	2	0.1	0.1	0.1	✓	1	✓	0	(1)	2	0.002	0.016	0.009	✓	1	✓
Kalannie	2	0.7	0.7	0.7	✓	1	✓	0	(1)	2	0.024	0.032	0.028	✓	1	✓
Kalgoorlie	4	0.2	0.7	0.4	✓	2	✓	0	(1)	4	0.025	0.077	0.059	✓	2	✓
Kambalda	2	0.2	0.5	0.3	✓	1	✓	0	(1)	2	0.031	0.080	0.056	✓	0	(1)
Kellerberrin	2	0.1	0.1	0.1	✓	1	✓	1	✓	2	0.004	0.014	0.009	✓	1	✓
Koolyanobbing	2	0.2	0.4	0.3	✓	1	✓	0	(1)	2	0.007	0.007	0.007	✓	1	✓
Koorda	2	0.7	0.7	0.7	✓	1	✓	0	(1)	2	0.014	0.021	0.018	✓	1	✓
Kununoppin	2	0.1	0.3	0.2	✓	1	✓	0	(1)	2	0.012	0.013	0.013	✓	1	✓
Laverton	4	2.4	8	6.3	✓	1	✓	0	(1)	2	0.045	0.069	0.057	✓	1	✓
Leonora	10	5.9	7.5	6.4	✓	1	✓	0	(1)	2	<0.001	<0.001	<0.001	✓	1	✓
Marvel Loch	2	1	1.2	1.1	✓	1	✓	0	(1)	2	0.014	0.043	0.029	✓	1	✓
Meckering	2	<0.05	0.1	<0.05	✓	1	✓	0	(1)	2	0.013	0.015	0.014	✓	1	✓
Menzies	6	11.1	14.1	12.1	(2)	1	✓	0	(1)	2	0.011	0.012	0.012	✓	1	✓
Merredin	2	0.2	0.3	0.3	✓	1	✓	1	✓	2	0.007	0.012	0.010	✓	1	✓
Milling	2	0.7	1.4	1.1	✓	1	✓	1	✓	2	0.014	0.014	0.014	✓	1	✓
Mukinbudin	2	0.2	0.3	0.2	✓	1	✓	0	(1)	2	<0.001	0.017	0.009	✓	1	✓
Muntadgin	2	0.1	1	0.6	✓	1	✓	0	(1)	2	0.005	0.011	0.008	✓	1	✓
Narembeen	2	0.2	0.2	0.2	✓	1	✓	0	(1)	2	0.008	0.008	0.008	✓	1	✓
Norseman	2	0.4	0.4	0.4	✓	1	✓	0	(1)	2	0.030	0.063	0.047	✓	0	(1)
Northam	2	0.1	0.1	0.1	✓	1	✓	0	(1)	2	0.006	0.014	0.010	✓	1	✓
Nungarin	2	0.1	0.1	0.1	✓	1	✓	0	(1)	2	0.004	0.008	0.006	✓	1	✓
Ora Banda	2	0.3	0.6	0.4	✓	1	✓	0	(1)	2	0.028	0.056	0.042	✓	1	✓
Pithara	2	0.3	0.6	0.4	✓	1	✓	0	(1)	2	0.015	0.017	0.016	✓	1	✓
Quairading	2	0.7	0.8	0.7	✓	1	✓	1	✓	2	0.047	0.053	0.050	✓	1	✓
Southern Cross	2	0.3	0.4	0.4	✓	1	✓	0	(1)	2	0.008	0.014	0.011	✓	1	✓
Tammin	2	0.1	0.1	0.1	✓	1	✓	0	(1)	2	0.007	0.011	0.009	✓	1	✓
Toodyay	2	0.1	0.1	0.1	✓	1	✓	0	(1)	2	0.011	0.012	0.012	✓	1	✓
Trayning	2	0.1	0.2	0.2	✓	1	✓	0	(1)	2	0.010	0.010	0.010	✓	1	✓
Warralakin	2	0.3	1.1	0.7	✓	1	✓	0	(1)	2	0.006	0.007	0.007	✓	1	✓
Westonia	2	0.3	0.9	0.6	✓	1	✓	0	(1)	2	0.006	0.022	0.014	✓	1	✓
Wiluna	6	12.4	16	14.7	(2)	1	✓	0	(1)	2	0.001	0.005	0.003	✓	0	(1)
Wongan Hills	2	0.1	0.2	0.1	✓	1	✓	0	(1)	2	0.009	0.042	0.026	✓	1	✓
Wubin	2	1.2	1.6	1.4	✓	1	✓	0	(1)	2	0.026	0.061	0.044	✓	1	✓
Wyalkatchem	2	0.2	0.6	0.4	✓	1	✓	0	(1)	2	0.021	0.040	0.031	✓	1	✓
York	2	0.1	0.1	0.1	✓	1	✓	0	(1)	2	0.011	0.015	0.013	✓	1	✓

(1) No samples required in this 12 month period. (2) Menzies and Wiluna have been granted an exemption from compliance with the nitrate guideline by the Department of Health. The water supplied is safe for adults and children over the age of 3 months. Carers of infants younger than 3 months should seek advice from the Community Health Nurse regarding the use of alternative water sources for the preparation of bottle feeds. The Water Corporation provides bottled water free of charge for this purpose.

Dr Christine Jeffries-Stokes  
 Chief Investigator – The Western Desert  
 Kidney Health Project  
 Christine.jeffries-stokes@rcswa.edu.au

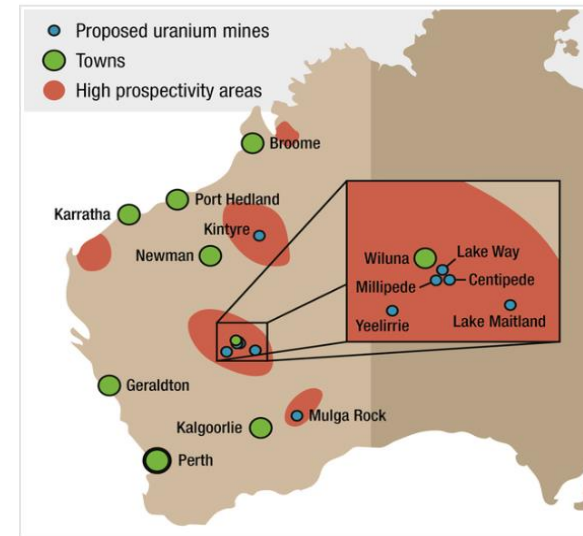


Low urine pH  
 Dehydration  
 High flouride  
 Arsenic  
 Lead  
 Nitrates  
 Uranium  
 Cadmium  
 Agrochemicals  
 Fire retardant  
 Chemicals for fracking (VOCS)  
**benzene, toluene,  
 ethylbenzene xylene etc**

## E Coli, uranium and nitrates found in water of WA remote ...

<https://www.theguardian.com/australia-news/2015/may/06/remote-indigenous-communities-in-western-australia-fail-water-safety-tests>

**Eighty per cent of remote Aboriginal communities in Western Australia whose essential services are delivered under a state-run program failed water safety tests**



UWA, UQ, QUT, Optimos solutions

**ANSTO:**

**Australia Nuclear Science and  
 and Technology Organisation  
 Sri Lanka, Australia, Central America**

## Acknowledgements

Amgen,

Roche,

Sanofi Genzyme

AUSHI

NHMRC of Australia

University of Queensland

Queensland University of Technology

Queensland Health

Our team