Risk factors for starting renal replacement therapy (RRT) and for mortality in CKD.QLD patients.

Z Wang[1,2], J Zhang[1,2] HG Healy[1,3], KS Tan[1,2,4], SK Venuthurupalli[1,2,5], A Cameron[1,2,3] and WE Hoy[1,2]
on behalf of the CKD.QLD Collaborative. www.ckdqld.org

[1]NHMRC CKD.CRE and CKD.QLD, Brisbane, Australia; [2]Centre for Chronic Disease, University of Queensland, Brisbane, Australia;
[3]Renal Services (RBWH), Metro North Hospital and Health Service, Brisbane, Australia; [4] Renal Services (Logan), Metro South Hospital and Health Service, Brisbane, Australia;
[5]Renal Services (Toowoomba Hospital), Darling Downs Hospital and Health Service, QLD, Australia

Aim

To determine the risk factors for RRT, and for death without RRT, in patients with chronic kidney disease (CKD) and enrolled in the CKD.QLD Registry.

Methods

- CKD.QLD is a program supporting surveillance, practice improvement and research of CKD. The collaborative embraces the renal practice network in the adult public health system in Queensland: Queensland Health.
- Enrolment of CKD patients via informed consent began in May 2011.
- Events of RRT and death without RRT were recorded until site censor dates (RBWH July 2015; Toowoomba Dec 2015; Logan May 2016).
- Selected available baseline variables were examined as potential predictors of outcomes, using Cox regression analyses.

Results

- A total of 3,452 patients from three leading sites were included. 47% were females. They were followed for a total 7,473 person years.
- 210 patients started RRT, and 357 patients died without RRT.

- **Figs 1a & 1b** show aggregate age distribution (all and by gender**).** Age at consent ranged from 16 to 100 yr, with a mean of 65 yr and median of 68 yr.

Fig 1a: Aggregate age distribution. N=3,452

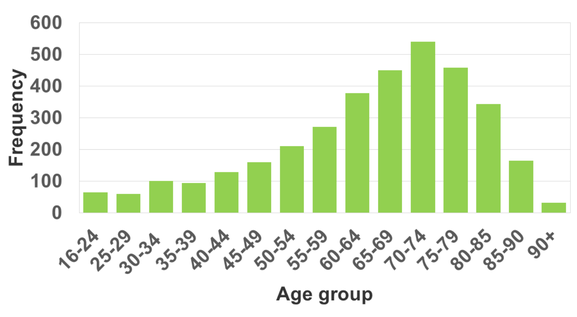
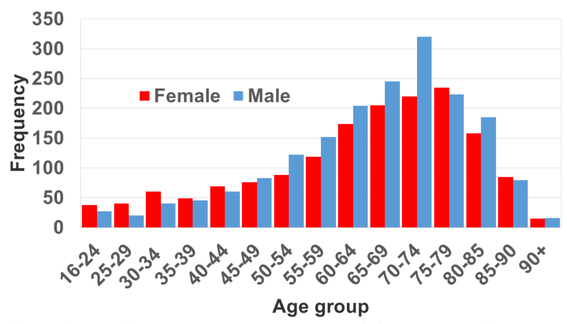


Fig 1b: Age distribution by gender. Female=1,631; Male=1,821



- **Figs 2a & 2b** show the CKD stage distribution, in aggregate and by gender.

Fig 2a: Aggregate stage distribution. N=3,452

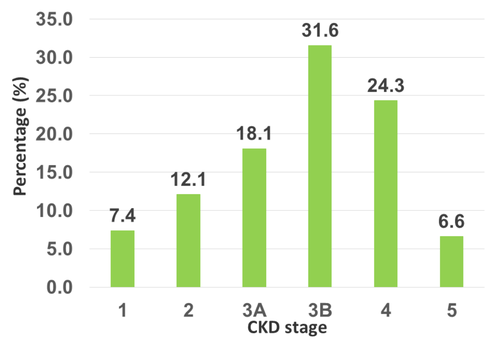
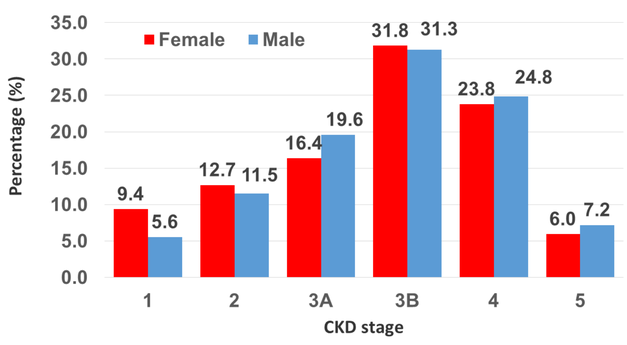


Fig 2b: Stage distribution by gender. Female=1,631; Male=1,821



- **Figs 3a & 3b** show that more than 80% of patients were either overweight or obese (normal is BMI 18.5-24; overweight is BMI 25-29; obese is BMI 30-39; and morbidly obese is BMI >=40).

Fig 3a: Percentages of BMI categories (All, N=3,366)

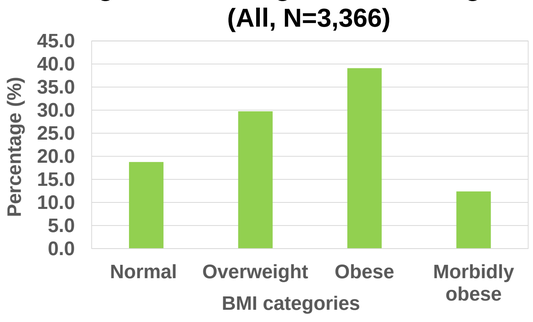
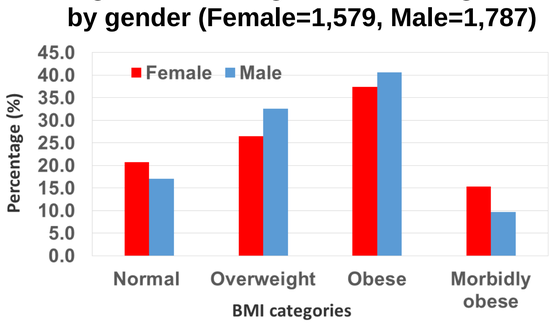


Fig 3b: Percentages of BMI categories by gender (Female=1,579, Male=1,787)



- **Figs 4a & 4b** show that more than 70% of patients had either micro or macro-proteinuria/albuminuria (normal levels are ACR<3.4 or PCR<15; "micro" levels are ACR 3.4-33 or PCR 15-49; and "macro" levels are ACR>=34 or PCR>=50).

Fig 4a: Percentages of proteinuria/albuminuria (All, N=2,634)

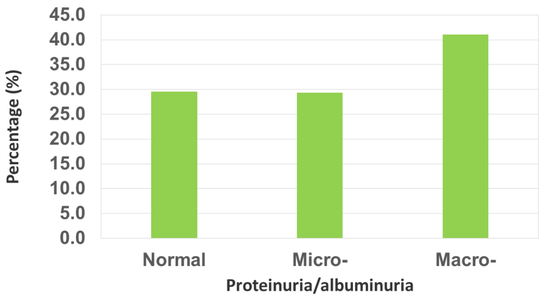
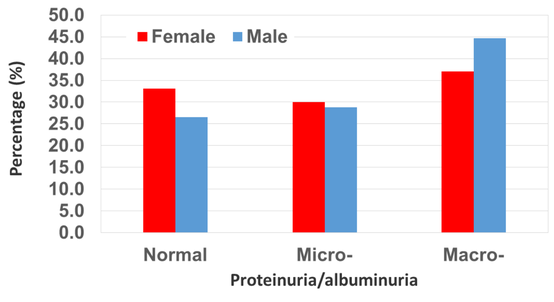


Fig 4b: Percentages of Proteinuria /albuminuria by gender (Female=1,235, Male=1,399)



- **Figs 5a, 5b & 5c** show primary renal diagnoses by aggregate and by gender. Renal vascular disease was the leading diagnosis, followed by diabetic nephropathy in all cohorts. (*GRD = genetic renal disease).

Fig 5a: Primary renal diagnosis ALL N=3,361

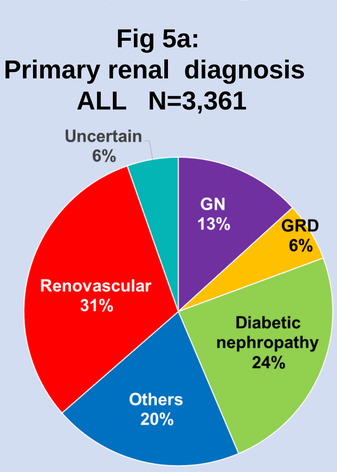


Fig 5b: Primary renal diagnosis Female N=1,591

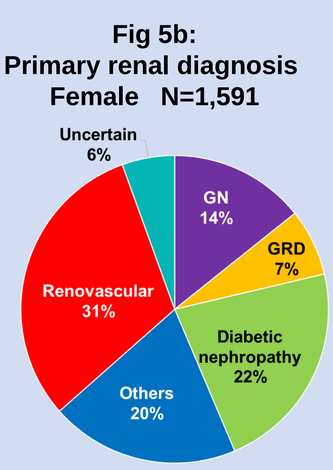
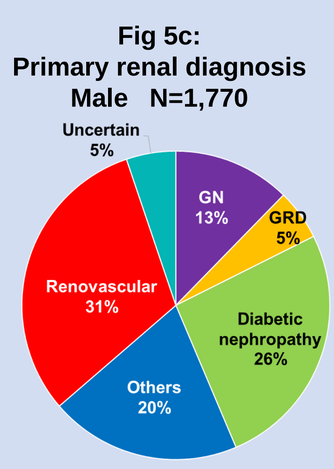


Fig 5c: Primary renal diagnosis Male N=1,770



- **Figs 6a & 6b** show the incidence rate of RRT, or death, per 100 person years, by aggregate data and by gender.

Fig 6a: Incidence rate of RRT/death. (per 100 person years)

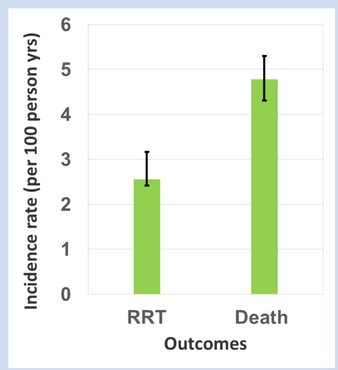
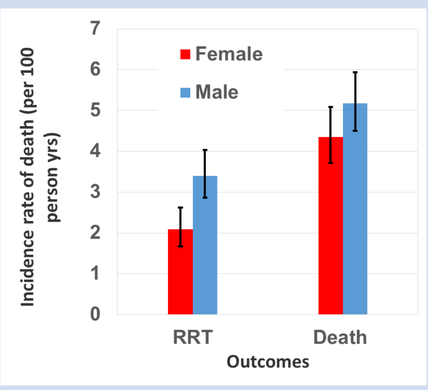
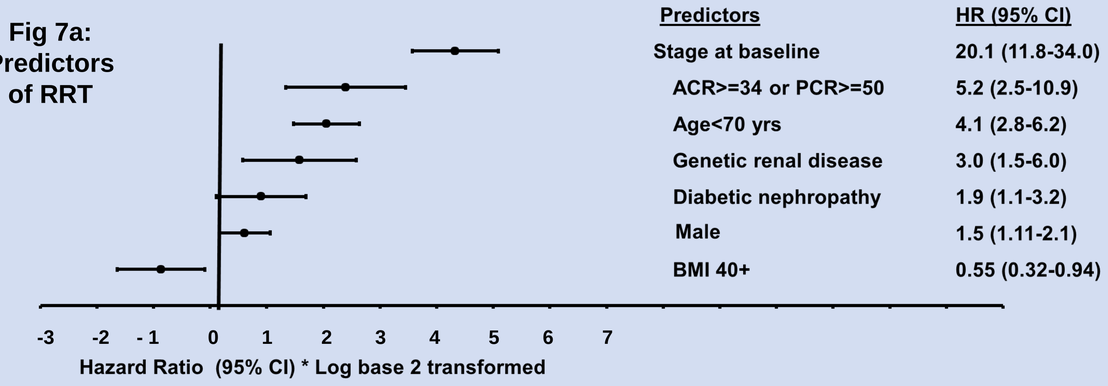


Fig 6b: Incidence rate of RRT/death by gender. (per 100 person years)



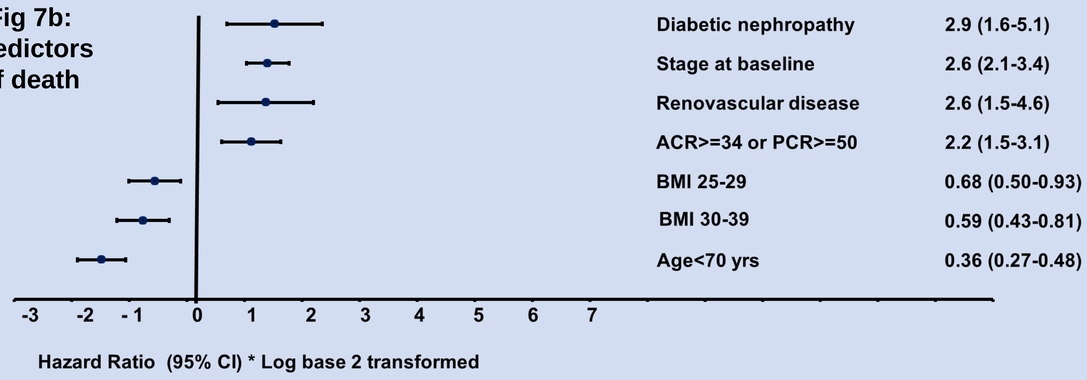
- **Figs 7a & 7b** show the hazard ratios (HRs) of independent predictors of RRT and death. The reference group for stage was stage 1+2+3; for ACR>=34 or PCR>=50 was ACR<3.4 or PCR<15; for age <70 yrs was age ≥ 70 yrs; for male was female; for renal diagnoses was GN, and for BMI 40+ was BMI 18.5-24.

Fig 7a: Predictors of RRT



Predictors	HR (95% CI)
Stage at baseline	20.1 (11.8-34.0)
ACR>=34 or PCR>=50	5.2 (2.5-10.9)
Age<70 yrs	4.1 (2.8-6.2)
Genetic renal disease	3.0 (1.5-6.0)
Diabetic nephropathy	1.9 (1.1-3.2)
Male	1.5 (1.11-2.1)
BMI 40+	0.55 (0.32-0.94)

Fig 7b: Predictors of death



Predictors	HR (95% CI)
Diabetic nephropathy	2.9 (1.6-5.1)
Stage at baseline	2.6 (2.1-3.4)
Renovascular disease	2.6 (1.5-4.6)
ACR>=34 or PCR>=50	2.2 (1.5-3.1)
BMI 25-29	0.68 (0.50-0.93)
BMI 30-39	0.59 (0.43-0.81)
Age<70 yrs	0.36 (0.27-0.48)

In addition, combined moderate and severe anaemia was also an independent predictor for death, in one site, where haemoglobin data were available.

Conclusions

Advanced CKD stage, macro-proteinuria/albuminuria and diabetic nephropathy were predictors for starting RRT or for death without RRT.

People who started RRT were also more likely younger and male. Those who died without RRT were more likely older and with renovascular disease.

Obesity has protective effect for both RRT and death.

Reference
1. Saran R et al.US renal data system 2014 annual data report: epidemiology of kidney disease in the United Status. Am J Kidney Dis 2015; 66(1)(suppl 1): s1-s306.

Enquires: Dr Zaimin Wang at z.wang2@uq.edu.au

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