

The AusDiab Study

This following is selected publications resulting from the AusDiab Kidney Study, grouped by area. The list seeks to provide an overview and is not all inclusive. In addition to key AusDiab-Kidney papers, this list includes papers which arose through collaborative efforts whereby AusDiab contributed to pooled data, most importantly and strategically through the CKD-Prognosis Consortium, or served to provide an Australian adult control population for comparative studies with indigenous Australians and with kidney transplant recipients as examples. Both avenues will continue to provide important papers, with ongoing collaborative work in train through the CKD-Prognosis Consortium and with ANZDATA.

Contents

Epidemiology of CKD in the General Australian Community	1
Lifestyle and CKD in Australia	3
CKD in Indigenous Australians	3
Burden of CKD in Australia, and Globally.....	4
CKD Policy and Practice	6

Epidemiology of CKD in the General Australian Community

Chadban SJ, Briganti EM, Kerr PG, Dunstan DW, Welborn TA, Zimmet PZ, Atkins RC. Prevalence of kidney damage in Australian adults: The AusDiab kidney study. *J Am Soc Nephrol.* 2003 Jul;14(7 Suppl 2):S131-8. *The original description of the prevalence and associations of CKD in the Australian community. (823 cites)*

White SL, Polkinghorne KR, Atkins RC, Chadban SJ. Comparison of the prevalence and mortality risk of CKD in Australia using the CKD Epidemiology Collaboration (CKD-EPI) and Modification of Diet in Renal Disease (MDRD) Study GFR estimating equations: the AusDiab (Australian Diabetes, Obesity and Lifestyle) Study. *Am J Kidney Dis.* 2010 Apr;55(4):660-70. *Among the 10 most frequently cited papers from AJKD in 2010, this paper highlighted the benefits of CKD-EPI eGFR over MDRD in avoiding mis-classification in defining CKD (227 cites)*

Briganti EM, Shaw JE, Chadban SJ, Zimmet PZ, Welborn TA, McNeil JJ, Atkins RC; Australian Diabetes, Obesity and Lifestyle Study (AusDiab). Untreated hypertension among Australian adults: the 1999-2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab). *Med J Aust.* 2003 Aug 4;179(3):135-9. *Showed the strong association between hypertension and CKD, but also the significant under-treatment of hypertension in the community (166 cites)*

White SL, Yu R, Craig JC, Polkinghorne KR, Atkins RC, Chadban SJ. Diagnostic accuracy of urine dipsticks for detection of albuminuria in the general

community. *Am J Kidney Dis.* 2011 Jul;58(1):19-28. *This paper clearly reveals the potential of urine dipstick for detection of CKD*

Atkins RC, Polkinghorne KR, Briganti EM, Shaw JE, Zimmet PZ, Chadban SJ. Prevalence of albuminuria in Australia: the AusDiab Kidney Study. *Kidney Int Suppl.* 2004 Nov;(92):S22-4. Review. *One of the first nation-wide studies of albuminuria prevalence.*

Atkins RC, Briganti EM, Zimmet PZ, Chadban SJ. Association between albuminuria and proteinuria in the general population: the AusDiab Study. *Nephrol Dial Transplant.* 2003 Oct;18(10):2170-4. *An important comparison of albuminuria and proteinuria population prevalence estimates.*

Johnson DW, Jones GR, Mathew TH, Ludlow MJ, **Chadban SJ**, Usherwood T, **Polkinghorne K**, Colagiuri S, Jerums G, Macisaac R, Martin H; Australasian Proteinuria Consensus Working Group. Chronic kidney disease and measurement of albuminuria or proteinuria: a position statement. *Med J Aust.* 2012 Aug 20;197(4):224-5. *This consensus position, much of which was based upon AusDiab data, has shaped practice in Australia.*

Tapp RJ, Shaw JE, Zimmet PZ, Balkau B, Chadban SJ, Tonkin AM, Welborn TA, Atkins RC. Albuminuria is evident in the early stages of diabetes onset: results from the Australian Diabetes, Obesity, and Lifestyle Study (AusDiab). *Am J Kidney Dis.* 2004 Nov;44(5):792-8. *One of the first studies to demonstrate the prevalence of albuminuria early in the course of T2DM.*

Polkinghorne KR, Su Q, Chadban SJ, Shaw JE, Zimmet PZ, Atkins RC. Population prevalence of albuminuria in the Australian Diabetes, Obesity, and Lifestyle (AusDiab) study: immunonephelometry compared with high-performance liquid chromatography. *Am J Kidney Dis.* 2006 Apr;47(4):604-13. *Comparison of methods of albuminuria detection.*

Magliano DJ, Polkinghorne KR, Barr EL, Su Q, Chadban SJ, Zimmet PZ, Shaw JE, Atkins RC. HPLC-detected albuminuria predicts mortality. *J Am Soc Nephrol.* 2007 Dec;18(12):3171-6. *An alternative method of albuminuria measurement that predicts mortality.*

White SL, Polkinghorne KR, Cass A, Shaw J, Atkins RC, Chadban SJ. Limited knowledge of kidney disease in a survey of AusDiab study participants. *Med J Aust.* 2008 Feb 18;188(4):204-8. *Here we found that the general Australian population has little knowledge of risk factors for CKD, thereby providing an important message for those who aim to prevent CKD.*

Barr EL, Reutens A, Magliano DJ, Wolfe R, Lu ZX, Sikaris KA, Tanamas SK, Atkins R, Chadban S, Shaw JE, Polkinghorne KR. Cystatin C estimated glomerular filtration rate and all-cause and cardiovascular disease mortality risk in the

general population: AusDiab study. *Nephrology (Carlton)*. 2017 Mar;22(3):243-250. *An exploration of CyC-based eGFR equations as an alternative to creatinine based eGFR for detection of CKD in Australia – the cost utility of CyC is not sufficient to justify its use over creatinine-based formulae for eGFR*

Damasiewicz MJ, Magliano DJ, Daly RM, Gagnon C, Lu ZX, Sikaris KA, Ebeling PR, Chadban SJ, Atkins RC, Kerr PG, Shaw JE, Polkinghorne KR. Serum 25-hydroxyvitamin D deficiency and the 5-year incidence of CKD. *Am J Kidney Dis*. 2013 Jul;62(1):58-66. Damasiewicz MJ, Magliano DJ, Daly RM, Gagnon C, Lu ZX, Ebeling PR, Chadban SJ, Atkins RC, Kerr PG, Shaw JE, Polkinghorne KR. 25-Hydroxyvitamin D levels and chronic kidney disease in the AusDiab (Australian Diabetes, Obesity and Lifestyle) study. *BMC Nephrol*. 2012 Jul 3;13:55. *These papers explored the associations between vitamin D status and CKD prevalence and incidence in Australia.*

Lifestyle and CKD in Australia

Lynch BM, White SL, Owen N, Healy GN, Chadban SJ, Atkins RC, Dunstan DW. Television viewing time and risk of chronic kidney disease in adults: the AusDiab Study. *Ann Behav Med*. 2010 Dec;40(3):265-74. White SL, Dunstan DW, Polkinghorne KR, Atkins RC, Cass A, Chadban SJ. Physical inactivity and chronic kidney disease in Australian adults: the AusDiab study. *Nutr Metab Cardiovasc Dis*. 2011 Feb;21(2):104-12. *These papers highlight the association between measures of sedentary behaviour and CKD in Australia and thereby deliver a powerful public health message – physical activity is important to prevent CKD, just as it is for other chronic non-communicable diseases.*

White SL, Polkinghorne KR, Cass A, Shaw JE, Atkins RC, Chadban SJ. Alcohol consumption and 5-year onset of chronic kidney disease: the AusDiab study. *Nephrol Dial Transplant*. 2009 Aug;24(8):2464-72. *Although the Australian public rated alcohol as the key cause of CKD, this study provided substantial evidence to the contrary.*

Briganti EM, Branley P, Chadban SJ, Shaw JE, McNeil JJ, Welborn TA, Atkins RC. Smoking is associated with renal impairment and proteinuria in the normal population: the AusDiab kidney study. Australian Diabetes, Obesity and Lifestyle Study. *Am J Kidney Dis*. 2002 Oct;40(4):704-12. *The important link between smoking and prevalent CKD in the community.*

CKD in Indigenous Australians

Hoy WE, Kondalsamy-Chennakesavan S, Wang Z, Briganti E, Shaw J, Polkinghorne K, Chadban S; AusDiab Study Group. Quantifying the excess risk for proteinuria,

hypertension and diabetes in Australian Aborigines: comparison of profiles in three remote communities in the Northern Territory with those in the AusDiab study. *Aust N Z J Public Health*. 2007 Apr;31(2):177-83.

Maple-Brown LJ, Cunningham J, Hodge AM, Weeramanthri T, Dunbar T, Lawton PD, Zimmet PZ, Chadban SJ, Polkinghorne KR, Shaw JE, O'Dea K. High rates of albuminuria but not of low eGFR in urban indigenous Australians: the DRUID study. *BMC Public Health*. 2011 May 19;11:346.

These papers compared findings between AusDiab and Indigenous cohorts and found a significantly higher prevalence of albuminuria among Indigenous Australians as compared to age-matched subjects from AusDiab.

Kondalsamy-Chennakesavan S, Hoy WE, Wang Z, Briganti E, Polkinghorne K, Chadban S, Shaw J; AusDiab Study Group. Anthropometric measurements of Australian Aboriginal adults living in remote areas: comparison with nationally representative findings. *Am J Hum Biol*. 2008 May-Jun;20(3):317-24. *Differences in body habitus between remote, Indigenous Australians and the AusDiab cohort were highlighted by this paper.*

AusDiab International Collaborations

Coresh J, Turin TC, Matsushita K, Sang Y, Ballew SH, Appel LJ, Arima H, **Chadban SJ**, Cirillo M, Djurdjev O, Green JA, Heine GH, Inker LA, Irie F, Ishani A, Ix JH, Kovesdy CP, Marks A, Ohkubo T, Shalev V, Shankar A, Wen CP, de Jong PE, Iseki K, Stengel B, Gansevoort RT, Levey AS. Decline in estimated glomerular filtration rate and subsequent risk of end-stage renal disease and mortality. *JAMA*. 2014 Jun 25;311(24):2518-2531. *A pivotal paper from the CKD Prognosis Consortium on the relationship between eGFR decline and hard outcomes in people with CKD which has attracted FDA approval as a surrogate measure of CKD decline. (252 cites)*

Shlipak MG, Matsushita K, Ärnlöv J, Inker LA, Katz R, **Polkinghorne KR**, Rothenbacher D, Sarnak MJ, Astor BC, Coresh J, Levey AS, Gansevoort RT; CKD Prognosis Consortium. Cystatin C versus creatinine in determining risk based on kidney function. *N Engl J Med*. 2013 Sep 5;369(10):932-43. *A definitive publication on the role of CyC in GFR estimation from the CKD Prognosis Consortium*

Zykova SN, Storhaug HM, Toft I, Chadban SJ, Jenssen TG, White SL. Cross-sectional analysis of nutrition and serum uric acid in two Caucasian cohorts: the AusDiab Study and the Tromsø study. *Nutr J*. 2015 May 14;14:49. *Collaboration with the Tromsø study investigators from Norway has good potential going forward for further collaborative analyses that afford greater generalizability than single-country studies.*

Burden of CKD in Australia, and Globally

Wyld ML, Lee CM, Zhuo X, White S, Shaw JE, Morton RL, Colagiuri S, Chadban SJ. Cost to government and society of chronic kidney disease stage 1-5: a national cohort study. *Intern Med J.* 2015 Jul;45(7):741-7.
Whilst the burden of treated ESKD has been well appreciated, this analysis found that the cost of CKD is likely 4-fold greater.

Thomas B, Matsushita K, Abate KH, Al-Aly Z, Ärnlöv J, Asayama K, **Atkins R**, Badawi A, Ballew SH, Banerjee A, Barregård L, Barrett-Connor E, Basu S, Bello AK, Bensenor I, Bergstrom J, Bikbov B, Blosser C, Brenner H, Carrero JJ, **Chadban S**, Cirillo M, Cortinovis M, Courville K, Dandona L, Dandona R, Estep K, Fernandes J, Fischer F, Fox C, Gansevoort RT, Gona PN, Gutierrez OM, Hamidi S, Hanson SW, Himmelfarb J, Jassal SK, Jee SH, Jha V, Jimenez-Corona A, Jonas JB, Kengne AP, Khader Y, Khang YH, Kim YJ, Klein B, Klein R, Kokubo Y, Kolte D, Lee K, Levey AS, Li Y, Lotufo P, El Razek HMA, Mendoza W, Metoki H, Mok Y, Muraki I, Muntner PM, Noda H, Ohkubo T, Ortiz A, Perico N, **Polkinghorne K**, Al-Radaddi R, Remuzzi G, Roth G, Rothenbacher D, Satoh M, Saum KU, Sawhney M, Schöttker B, Shankar A, Shlipak M, Silva DAS, Toyoshima H, Ukwaja K, Umesawa M, Vollset SE, Warnock DG, Werdecker A, Yamagishi K, Yano Y, Yonemoto N, Zaki MES, Naghavi M, Forouzanfar MH, Murray CJL, Coresh J, Vos T; Global Burden of Disease 2013 GFR Collaborators; **CKD Prognosis Consortium**; Global Burden of Disease Genitourinary Expert Group. Global Cardiovascular and Renal Outcomes of Reduced GFR. *J Am Soc Nephrol.* 2017 Jul;28(7):2167-2179. *By contributing to the CKD Prognosis Consortium and, via this, to the Global Burden of Disease project, AusDiab has ensured Australian involvement in the numerous, high level outputs from this collaboration.*

Australian collaborations

Chadban SJ, Baines L, Polkinghorne K, Jefferys A, Dogra S, Kanganas C, Irish A, Eris J, Walker R. Anemia after kidney transplantation is not completely explained by reduced kidney function. *Am J Kidney Dis.* 2007 Feb;49(2):301-9. Erratum in: *Am J Kidney Dis.* 2009 Dec;54(6):1192-3. *Kidney transplant recipients were propensity-matched with AusDiab participants for eGFR which revealed a higher prevalence of anaemia among the transplanted group.*

Wang AY, Bellomo R, Cass A, Finfer S, Gattas D, Myburgh J, Chadban S, Hirakawa Y, Ninomiya T, Li Q, Lo S, Barzi F, Sukkar L, Jardine M, Gallagher MP; POST-RENAL Study Investigators and the ANZICS Clinical Trials Group. Health-related quality of life in survivors of acute kidney injury: The Prolonged Outcomes Study of the Randomized Evaluation of Normal versus Augmented Level Replacement Therapy study outcomes. *Nephrology (Carlton).* 2015 Jul;20(7):492-8.

Villar E, Polkinghorne KR, Chang SH, Chadban SJ, McDonald SP. Effect of type 2 diabetes on mortality risk associated with end-stage kidney disease. *Diabetologia.* 2009 Dec;52(12):2536-41. *Here we selected AusDiab participants with T2DM as a control group to enable comparison to those with T2DM and ESKD as*

captured by the ANZDATA registry and demonstrated that people with T2DM who receive dialysis or transplantation exhibit superior survival, indicating likely selection bias in the provision of renal replacement therapy.

CKD Policy and Practice

Polkinghorne KR, Chadban SJ. A decade after the KDOQI CKD guidelines: a perspective from Australia. *Am J Kidney Dis.* 2012 Nov;60(5):725-6. *This invited editorial summarises progress in Australia over 10 years since the introduction of automated eGFR reporting*