SUPPLEMENTARY MATERIAL

The preventable productivity burden of kidney disease in Australia

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Table of Contents

Supplementary Tables 3

Supplementary Table 1. Description of the model inputs and data sources 3

Supplementary Table 2. The estimated proportion of equivalent full time workers (%) in the general population, and separated by kidney disease status, among Australians of working age 13

Supplementary Table 3. Description of the scenario analyses 15

Supplementary Table 4. The estimated number of people with and without kidney disease, years of life lived, PALYs and the broader economic cost (in terms of GDP) among Australian males of working age (15-69 years) from 2020 to 2029 18

Supplementary Table 5. The estimated number of people with and without kidney disease, years of life lived, PALYs and the broader economic cost (in terms of GDP) among Australian females of working age (15-69 years) from 2020 to 2029 20

Supplementary Table 6. The impact of preventing new cases of kidney disease in terms of deaths averted, years of life saved, PALYs saved, and costs saved among Australian males and females of working age (15-69 years) over ten years (2020 to 2029) 22

Supplementary Tables

Supplementary Table 1. Description of the model inputs and data sources

No.	Input	Description	Data source
1	**Population**	Australian population stratified by single year of age and sex in 2019.	ABS (1)
2	**Birth numbers**	Australian birth projections until 2039 (with medium assumption) stratified by single year of age, with 2017 as the baseline year.	ABS (1)
3	**All-cause mortality rates**	Australian all-cause mortality rate projections until 2039 (with medium assumption) stratified by single year of age, with 2017 as the baseline year.	ABS (1)
4	**Migration**	Age- and sex-specific net overall migration estimates for 2017 to 2027 were calculated based on projected ABS overseas departure and arrival data (1). Migration estimates post-2027 remained the same as 2027 as per ABS assumptions. Owing to stringent health selection criteria, migrants are normally healthy. However, migration into Australia has diversified from across the globe, particularly migrants from Asian countries, which are at higher risks of developing CKD compared to those of European descent (2). This has been shown to offset the 'healthy migrant effect' (2). Thus, migration estimates in the model were assumed to be apportioned into disease status (no kidney disease, CKD or ESRD) as per the estimated prevalence of CKD and ESRD (refer to item no. 5 and 7 of this Supplementary Table).	ABS (1)
5	**Prevalence of chronic kidney disease (Stage 3 to 5 not undergoing renal replacement therapy)**	The prevalence of CKD (non-renal replacement therapy (RRT) dependent, inclusive of all stages of CKD) was obtained from the Australian Institute of Health and Welfare (AIHW) 2013 report (3). For every age group available, the mid-point of each age-group (e.g. 49.5 for 45-54 years, 59.5 for 55-64 years) was plotted against the corresponding point estimate (prevalence). Exponential functions were used to calculate CKD sex-specific prevalence rates for every single year of age using the following formulae:	AIHW (3) ABS (AHS) (4)

		Male: $y = 0.0096943355e^{0.0430185426x}$, $R^2>0.93$ Female: $y = 0.0116469471e^{0.0368288910x}$, $R^2>0.74$ Note: x denotes year of age; y denotes the estimated prevalence. The prevalence rates were adjusted to include only people with Stage 3 CKD and Stage 4-5 using sex- and eGFR-specific data reported in the Australian Health Survey (AHS) (2011-2012) (4) using the following formulae: Adjusted Stage 3 CKD *prev* = point estimate of unadjusted *prev* * 1 – (*prev* of Stage 1 CKD + *prev* of Stage 2 CKD + *prev* of Stage 4-5 CKD) Adjusted Stage 4-5 CKD *prev* = point estimate of unadjusted *prev* * 1 – (*prev* of Stage 1 CKD + *prev* of Stage 2 CKD + *prev* of Stage 3 CKD) Note: *prev* denotes prevalence. Using the methods described above, the prevalence of CKD Stage 3 CKD among working-age Australians (15-69 years old) in our model ranges from 1.12% to 5.73% in males and 1.32% to 5.34% in females. The prevalence of CKD Stage 4-5 (not undergoing RRT) ranges from 0.07% to 0.37% in males and 0.15% to 0.61% in females.	
6	**Prevalence of end-stage renal disease (Stage 5 undergoing renal replacement therapy)**	Prevalence rates of ESRD were adapted from the AIHW report of Australian and New Zealand Dialysis and Transplant (ANZDATA) Registry data in 2013. This registry provides information regarding all patients receiving RRT and intending to undergo long term treatment. Similar to CKD, the mid-point of each age groups was plotted against the prevalence estimate. Polynomial functions were used to calculate prevalence rates of ESRD for every single year of age and sex, using the following formulae:	AIHW (3)

		Male: y = -0.00000003x^3 + 0.00000461x^2 - 0.00015075x + 0.00146765, R^2>0.99 Female: y = -0.000000026x^3 + 0.000003721x^2 - 0.000121272x + 0.001178673, R^2>0.97 Note: x denotes year of age; y denotes the estimated prevalence	
7	**Incidence of chronic kidney disease and end-stage renal disease**	Due to a lack of data for incidence of Stage 3 and Stage 4-5 CKD, annual transition probabilities for the progression from 1) 'no kidney disease' health state into Stage 3 CKD, 2) from Stage 3 to Stage 4-5 CKD, and finally 3) the progression from Stage 4-5 CKD to ESRD (requiring RRT) were determined. The formulae to calculate annual transition probabilities to model kidney disease progression was derived from Grams et al as follows: Incidence of kidney disease at age x = ($P_{CKD,x+1}$ - $P_{CKD,x}$) / (1 - $P_{CKD,x}$) + M_x * [($P_{noCKD,x+1}$ / $P_{noCKD,x}$) – ($Q_{noCKD,x}$ / M_x)] Wherein, M_x = Mortality rate of the entire population aged x. This was derived from Supplementary Table 1 item 3. $Q_{noCKD,x}$ = One year probability of death among those without kidney disease (for Stage 3 transition probability), without Stage 3 CKD (for Stage 4-5 transition probability) and without Stage 4-5 CKD (for ESRD transition probability). $P_{CKD,x}$ = Prevalence of CKD at age x. This was derived from Supplementary Table 1 item 5 and 6. Age-, sex- and year-specific estimates were derived from the above formulae for Stage 3 and Stage 4-5 CKD, as well as ESRD.	AIHW (3)

		Notably, although data on ESRD incidence in the Australian general population was available (AIHW), we opted to utilise the above transition probability formulae to accurately capture stage-specific kidney disease progression and maintain consistency.	
8	**Risk of all-cause mortality in those with and without kidney disease**	Eriksen *et al* measured the standardised incidence ratio (SIR) for death in 3,047 patients with Stage 3 CKD in Tromso, Norway. The SIR of all-cause mortality in those with Stage 3 CKD was 2.2 (95% confidence interval (CI) 2.1 to 2.4) compared to the general population. Hazard ratio (HR) of all-cause mortality associated with Stage 4-5 CKD and ESRD was derived from a Swedish cohort study which aimed to assess the risk of all-cause mortality due to 1) CKD (Stage 4 to 5 not undergoing dialysis) (n=3,040), 2) peritoneal dialysis (n=725), 3) haemodialysis (n=1,791) and 4) renal transplantation (n=606). Mean age of patients in the study was 66 years. The data was derived from the Stockholm County clinical quality registers for renal disease (1999-2010). The weighted HR of all-cause mortality for patients with Stage 4-5 CKD was 3.6 (95%CI 3.3 to 4.0), while for patients on dialysis or renal transplant the HR was 5.3 (95% CI 4.2 to 6.6). The SIR of all-cause mortality in those with Stage 3 CKD and the HRs of all-cause mortality in those with Stage 4-5 CKD and ESRD outlined above were used to determine mortality rates in those with and without kidney disease, for both males and females, using the following formulae: *MortNoKD* = *MortTotal* / [(*prev* of Stage 3 CKD * *SIR* of Stage 3 CKD) + (*prev* of Stage 4-5 CKD * *HR* of Stage 4-5 CKD) + (*prev* of ESRD * *HR* of ESRD) + (*1-prev* of *Stage 3 CKD - prev* of *Stage 4-5 CKD - prev* of *ESRD*)] *MortCKD3* = *MortNoKD* * *SIR* of Stage 3 CKD *MortCKD4-5* = *MortNoKD* * *HR* of Stage 4-5 CKD	Neovius *et al* (5)

		MortESRD = *MortNoKD* * *HR* of ESRD where *MortNoKD* is the mortality rate in those without kidney disease, *MortTotal* is the mortality rate for the total population, *MortCKD3 and MortCKD4-5* is the mortality rate in those with Stage 3 and Stage 4-5 CKD, respectively, and *MortESRD* is the mortality rate in those with ESRD. Note: *prev* denotes prevalence as per AIHW report (see descriptions of item no. 5 and 7 in this table), *SIR* denotes the standardised incidence ratio for mortality in those with Stage 3 CKD as reported by Eriksen et al, while *HR* denotes the hazard ratio for mortality associated with Stage 4-5 CKD and ESRD as reported by Neovius *et al.*	
9	**Productivity index in those with and without kidney disease**	Productivity indices were derived from condition-specific productivity impacts. For those with CKD and ESRD, the productivity impacts were derived from van Haalen *et al*. The study estimated productivity losses among patients with kidney disease based on the Adelphi Real World Disease-Specific Programme conducted in France, Italy, the UK, Germany, Spain, the USA and China (n=5,276). Productivity data reported was based on the Work Productivity and Activity Impairment questionnaire. Productivity impacts reported by van Haalen *et al* were in terms of percentage of productivity loss. To convert these into days lost per year, the estimates were multiplied by 240 (the total number of working days per person per year). The estimated number of working days lost to absenteeism and presenteeism in those with Stage 3 CKD were 14.4 (95%CI 12.3 to 16.4) and 46.2 (95%CI 43.9 to 48.5), respectively. Among those with Stage 4-5 CKD (non-RRT dependent), absenteeism contributed to a loss of 17.0 working days (95%CI 15.8 to 18.3) per year, while presenteeism resulted in a loss of 53.5 working days (95%CI 52.1 to 55.0). The absenteeism and presenteeism in those with ESRD were 29.3 days (95%CI 27.6 to 30.9) and 83.3 days (95%CI 81.6 to 85), respectively.	van Haalen *et al* (6) AHRI (7) Medibank (8)

		Productivity impacts for those without kidney disease were drawn from the Australian general population data. Absenteeism estimates were adapted from the Australian Human Research Institute (AHRI) survey. The survey was conducted among participants working in the public, private and non-profit sectors across Australia in 2015 (n=533). Presenteeism was drawn from a report by Medibank Australia. The number of days lost due to absenteeism and presenteeism in the Australian general population were 8.8 days and 6.5 days per person per year, respectively. Productivity indices were calculated using the following formulae: Productivity index = *[240 – (productive days lost to absenteeism + presenteeism)] / 240* where 240 represents the total number of working days per person per year assuming full time workers work 48 weeks a year (with 4 weeks annual leave) and 5 days a week. The estimated productivity indices in those with CKD and ESRD were 0.706 and 0.531, respectively, while the cohort without kidney disease had a productivity index of 0.936. The productivity indices were applied to years of life lived and the proportion of equivalent full-time workers (described below) to obtain productivity-adjusted life years (PALYs).	
10	**Labour force participation rates and proportion of equivalent full-time workers**	Australian labour force participation rates separated by age and sex (latest available data: 2019) were obtained from the ABS. This was reported for age 0 to 100, grouped per 10 years (e.g. 45-54) except for age groups 0-15 and 65-100. For every age group, the mid-point of each age-group (e.g. 49.5 for 45-54 years, 59.5 for 55-64 years and 82.5 for 65-100) was plotted against the corresponding point estimate (i.e. the labour participation	ABS (9, 10) Klarenbach *et al* (11)

		rate). Labour force participation rates by single year of age for males and females were extrapolated using the following polynomial equations: Male: y = -0.0459607833x^2 + 3.8337702738x + 12.5764063789, R^2>0.93 Female: y = -0.0379339365x^2 + 2.9570588025x + 23.5457900691), R^2>0.94 Note: x denotes year of age; y denotes estimated labour force participation. Age- and sex-specific labour force participation in those with and without kidney disease was calculated by applying the hazard ratio associated with labour force withdrawal in those with kidney disease to the total Australian labour force participation rates using the following formulae: *LFPNoKD* = *LFPTotal* / (*prev* of Stage 3 CKD * *HR* of Stage 3 CKD) + (*prev* of Stage 4-5 CKD * *HR* of Stage 4-5 CKD) + (*prev* of ESRD * *HR* of ESRD) + (1 - *prev* of Stage 3 CKD - *prev* of Stage 4-5 CKD - *prev* of ESRD) *LFP-CKD4-5* = *LFPNoKD* * *HR* of Stage 4-5CKD *LFP-ESRD* = *LFPNoKD* * *HR* of ESRD where *LFPNoKD* is the labour force participation rate in those without kidney disease, *LFPTotal* is the labour force participation rate in the general population, and *LFP-CKD4-5* and *LFP-ESRD* is the labour force participation rate in those with Stage 4-5 CKD and ESRD, respectively.	

		Note: *prev* denotes prevalence as per AIHW report (see description in no. **5** and **7** in this table), *HR* denotes the hazard ratio for early labour force withdrawal associated with renal insufficiency as reported by Klarenbach *et al.* The study by Klarenbach *et al* estimated the impact of renal insufficiency on workforce participation among patients aged 18 to 64 years based on the Third National Health and Nutrition Examination Survey (NHANES III). Renal insufficiency was defined as a serum creatinine level of >2.0 mg/dL for men and >1.7 mg/dL for women, and therefore broadly includes those with CKD (approximately Stage 3b and above) and ESRD. The HR of early labour force withdrawal was 7.94 (95%CI 1.6 to 39.43) for those with renal insufficiency, and was utilised for the cohort with ESRD in the model (due to lack of an ESRD-specific estimate). A secondary analysis by Klarenbach *et al* excluding those with ESRD resulted in an HR of 5.36, and this was adopted for the Stage 4-5 CKD cohort. Due to a lack of data to inform the estimate, we have made a conservative assumption that those with Stage 3 CKD have the same labour force participation rate as those without kidney disease. Therefore, to calculate *LFPNoKD,* the hazard ratio of labour force withdrawal for Stage 3 CKD was set as '1'. The calculated estimates of *LFPNoKD* were employed for those with Stage 3 CKD to estimate condition-specific proportion of EFT outlined below. The labour participation rates were adjusted to the reported mean number of hours worked (latest available: 2016 data) drawn from the ABS to obtain condition-specific proportion of EFT workers, using the following formulae: Adjusted EFT for no kidney disease and Stage 3 CKD = *LFPNoKD * (average no. of hours worked / 40)*	

		Adjusted EFT for Stage 4-5 CKD = *LFP-CKD4-5 * (average no. of hours worked / 40)* Adjusted EFT for ESRD = *LFP-ESRD * (average no. of hours worked / 40)* Where *LFPNoKD* is the labour force participation rate in those without kidney disease (and those with Stage 3 CKD), and *LFP-CKD4-5* and *LFP-ESRD* is the labour force participation rate in those with Stage 4-5 CKD and ESRD, respectively. For example, after adjusting for the HR of early labour force withdrawal, the labour force participation rate among males aged 35 years without kidney disease and with Stage 3 CKD was 91.0%, while the labour force participation rates in those with Stage 4-5 CKD and ESRD were respectively 91.0%, 51.9% and 28.9%. These rates were adjusted to the reported mean number of hours worked among males aged 35 years (which was 42 hours), as follows: Adjusted EFT for no kidney disease/Stage 3 CKD = *91.0% * (42/40) = 95%* Adjusted EFT for Stage 4-5 CKD = *49.2% * (42/40) = 52%* Adjusted EFT for ESRD = *24.8% * (42/40) = 26%* The proportion of EFT workers were applied to years of life lived and productivity indices to obtain the number of PALYs.	
11	**Gross domestic product (per PALY**	Australian gross domestic product (GDP) per hour worked projections for 1975 to 2018 were used to determine GDP per EFT (assuming 40 hours worked per week and 48 weeks worked per year).	ABS (12)

		Linear functions estimated the GDP per EFT beyond 2018 using the following formulae: $y = 2{,}302.72811839x + 91{,}333.34460888$, $R^2 > 0.98$ Note: x denotes the year; y denotes the estimated GDP per EFT. The GDP per EFT value derived was considered the economic value of each PALY for that year, and multiplied with the estimated number of PALYs for each year to calculate broader economic costs (GDP per PALY).	

ABS: Australian Bureau of Statistics, AHRI: Australian Human Research Institute, AIHW: Australian Institute of Health and Welfare, CKD: chronic kidney disease, EFT: equivalent full time, ESRD: end-stage renal disease, GDP: gross domestic product, PALY: productivity-adjusted life year.

Supplementary Table 2. The estimated proportion of equivalent full time workers (%) in the general population, and separated by kidney disease status, among Australians of working age

Age (years)	EFT workers in the general population (%)		EFT workers without kidney disease and with Stage 3 CKD (%)*		EFT workers with Stage 4-5 CKD (%)*		EFT workers with ESRD (%)*	
	Male	Female	Male	Female	Male	Female	Male	Female
15	30%	22%	30%	22%	0%	0%	0%	0%
16	31%	23%	31%	23%	0%	0%	0%	0%
17	32%	24%	32%	24%	0%	0%	0%	0%
18	33%	24%	33%	24%	0%	0%	0%	0%
19	34%	25%	34%	25%	0%	0%	0%	0%
20	57%	47%	57%	47%	0%	0%	0%	0%
21	58%	48%	58%	48%	0%	0%	0%	0%
22	60%	49%	60%	49%	0%	0%	0%	0%
23	61%	50%	61%	50%	0%	0%	0%	0%
24	62%	51%	63%	51%	0%	0%	0%	0%
25	78%	61%	78%	61%	0%	0%	0%	0%
26	79%	62%	79%	62%	0%	0%	0%	0%
27	81%	62%	81%	63%	7%	0%	0%	0%
28	82%	63%	82%	63%	14%	0%	0%	0%
29	83%	64%	83%	64%	20%	0%	0%	0%
30	88%	61%	88%	61%	27%	0%	0%	0%
31	89%	61%	90%	61%	33%	0%	0%	0%
32	90%	61%	90%	62%	38%	0%	7%	0%
33	91%	62%	91%	62%	43%	0%	14%	0%
34	92%	62%	92%	62%	47%	0%	20%	0%
35	95%	60%	95%	61%	52%	0%	26%	0%
36	96%	61%	96%	61%	55%	0%	31%	0%
37	96%	61%	96%	61%	58%	0%	35%	0%
38	96%	61%	97%	61%	60%	0%	38%	0%
39	97%	61%	97%	61%	61%	0%	41%	0%
40	97%	65%	97%	65%	63%	0%	42%	0%
41	97%	65%	97%	65%	63%	0%	43%	0%
42	97%	65%	97%	65%	63%	0%	43%	0%
43	97%	64%	97%	65%	63%	0%	43%	0%
44	97%	64%	97%	64%	62%	0%	42%	0%

45	97%	66%	97%	66%	61%	0%	39%	0%
46	96%	65%	96%	66%	59%	0%	37%	0%
47	96%	65%	96%	65%	56%	0%	33%	0%
48	95%	64%	95%	65%	54%	0%	29%	0%
49	95%	64%	95%	64%	50%	0%	24%	0%
50	94%	63%	94%	64%	46%	0%	18%	0%
51	93%	62%	93%	63%	42%	0%	11%	0%
52	92%	62%	92%	62%	37%	0%	4%	0%
53	91%	61%	91%	61%	32%	0%	0%	0%
54	90%	60%	90%	60%	26%	0%	0%	0%
55	84%	57%	85%	58%	18%	0%	0%	0%
56	83%	56%	84%	57%	12%	0%	0%	0%
57	82%	55%	82%	56%	5%	0%	0%	0%
58	80%	54%	81%	55%	0%	0%	0%	0%
59	79%	53%	79%	54%	0%	0%	0%	0%
60	71%	47%	72%	47%	0%	0%	0%	0%
61	70%	46%	70%	46%	0%	0%	0%	0%
62	68%	44%	69%	45%	0%	0%	0%	0%
63	66%	43%	67%	44%	0%	0%	0%	0%
64	64%	42%	65%	43%	0%	0%	0%	0%
65	56%	35%	57%	36%	0%	0%	0%	0%
66	54%	33%	55%	34%	0%	0%	0%	0%
67	52%	32%	53%	33%	0%	0%	0%	0%
68	50%	31%	51%	32%	0%	0%	0%	0%
69	48%	29%	49%	31%	0%	0%	0%	0%

*Used in the base case analysis of the model.

Labour force participation data was derived from the Australian Bureau of Statistics report (2019) and adjusted for EFT workers based on the reported number of hours worked in every age group (Supplementary Table 1, item no. 10).

CKD: chronic kidney disease, EFT: equivalent full-time, ESRD: end-stage renal disease.

Supplementary Table 3. Description of the scenario analyses

No	Scenario analyses	Description	Data source
1	**Impact of kidney disease-related mortality, early labour force withdrawal, absenteeism and presenteeism**	The contribution of kidney disease-related premature mortality, early labour force withdrawal, absenteeism and presenteeism on PALYs and associated economic costs was analysed. To assess each component, each factor was inputted into the model while the others were 'switched off'. For instance, to assess the proportional contribution of premature mortality due to CKD among males, the mortality rates among males were assigned the HR of 2.2 in those with Stage 3 CKD (see Supplementary Table 1, item no. 8), while the HR inputs in other cohorts were ascribed a value of 1. In other words, the mortality rates for female without kidney disease were applied to females with Stage 4-5 CKD and ESRD, and the mortality rates of each male and female without kidney disease were respectively applied to males and females with Stage 4-5 CKD and ESRD. The number of days of absenteeism and presenteeism due to Stage 3 and Stage 4-5 CKD and ESRD were removed and instead, the general population estimates of absenteeism and presenteeism were used. The simulation therefore reflected the impact of premature mortality due to CKD on the estimated number of PALYs in males. The results of the above simulations are presented as the difference compared to an analysis assuming the entire population was 'free' of prevalent and incident cases of kidney disease. To simulate this effect (i.e. the entire population which was 'free' of the impacts of kidney disease), those with CKD and ESRD were assumed to have the same productivity estimates (including hazard risk of all-cause mortality, hazard risk of early labour force withdrawal, absenteeism and presenteeism) as the 'no kidney disease' cohort. Thus, the impacts of kidney disease were 'nullified'. The estimated total PALYs and associated economic costs for this simulation were 90,418,349 and U$12,993,466,752,368, respectively. The results are outlined in Fig. 2 in the manuscript.	

2	**Time horizon**	First, the model time horizon was extended to twenty years (2020-2039). Second, the model time horizon was shortened to five years (2020-2024). Both scenarios assumed current trajectories of CKD and ESRD (i.e. current prevalence and incidence rates). Several related scenarios were further tested, including reducing the incidence of kidney disease by 10% and 100%.	
3	**Proportion of EFT workers based on the general population (non-disease-specific estimate)**	Australian labour force participation rates of the general population in 2019 was utilised (see Supplementary Table 1, item no. 11 for details), as reported by the ABS. The labour force participation rates were adjusted to the reported mean number of hours worked drawn from the ABS (2016 data) to estimate proportions of EFT workers. These estimates were not adjusted to the hazard ratio of early labour force withdrawal due to kidney disease, and **therefore was not condition-specific**. The following formulae was used to calculate EFT: EFT for general population = *LFPTotal * (average no. of hours worked / 40)* where *LFPTotal* is the labour force participation rate in the general population. The estimates are presented in Supplementary Table 2 and applied to the CKD and ESRD cohort. as well as the cohort without kidney disease in the model for this scenario analysis. The results are presented in Table 4 in the main manuscript.	ABS (9, 10)

4	**Discount rate and GDP**	A 5% discount rate is an Australian standard (13). Therefore, we considered the World Health Organisation discount rate of 3% as well as 0% and assessed the impact on the model outputs. A temporal trend was applied to the GDP per EFT worker for the base case analysis (Supplementary Table 1, item no. 11). In this scenario analysis, temporal growth was discarded and GDP per EFT for the year 2018 (latest available year) was assumed to be constant across the model time horizon.	
5	**Using upper and lower estimates of key inputs**	To explore which key model inputs the model was most sensitive to, the upper and lower limit of absenteeism, presenteeism, labour force withdrawal and the increased risk of mortality associated with CKD and ESRD were tested.	

ABS: Australian Bureau of Statistics, CKD: chronic kidney disease, EFT: equivalent full time, ESRD: end-stage renal disease, GDP: gross domestic product.

Supplementary Table 4. The estimated number of people with and without kidney disease, years of life lived, PALYs and the broader economic cost (in terms of GDP) among Australian males of working age (15-69 years) from 2020 to 2029

Year	Total number of males		Total years of life lived in males		Total PALYs in males		Total cost (US$)	
	Without kidney disease	With kidney disease	Without kidney disease	With kidney disease	Without kidney disease	With kidney disease	Without kidney disease	With kidney disease
2020	8,753,148	216,360	8,279,890	107,807	6,058,435	107,807	$1,195,079,920,383	$21,265,948,411
2021	8,874,881	217,827	7,994,571	103,460	5,849,986	103,460	$1,167,432,298,988	$20,646,674,300
2022	9,001,739	219,522	7,721,248	99,341	5,647,461	99,341	$1,140,020,730,332	$20,053,308,538
2023	9,125,988	221,223	7,456,863	95,427	5,450,631	95,427	$1,112,839,179,236	$19,482,949,924
2024	9,249,046	223,062	7,198,660	91,698	5,259,394	91,698	$1,085,905,856,066	$18,932,814,025
2025	9,369,301	224,867	6,946,649	88,141	5,073,826	88,141	$1,059,275,253,735	$18,401,435,924
2026	9,482,650	226,457	6,698,865	84,700	4,892,578	84,700	$1,032,701,931,637	$17,878,027,608
2027	9,593,749	228,107	6,455,829	81,381	4,715,697	81,381	$1,006,225,732,449	$17,364,886,027
2028	9,704,631	229,739	6,219,954	78,206	4,544,344	78,206	$980,127,121,516	$16,867,508,095
2029	9,811,655	231,333	5,990,653	75,160	4,378,477	75,160	$954,435,289,431	$16,383,663,147
Total	**92,966,787**	**2,238,497**	**70,963,181**	**905,320**	**51,870,830**	**905,320**	**$10,734,043,313,773**	**$187,277,215,998**
Total (with and without kidney disease)	**95,205,285**		**71,868,501**		**52,776,151**		**$10,921,320,529,771**	

Years of life lived, PALYs and costs were subject to an annual discount rate of 5% applied beyond the first year, and therefore represent discounted values.

CKD: chronic kidney disease, ESRD: end-stage renal disease, GDP: gross domestic product, PALY: productivity-adjusted life years, US$: US dollars.

Supplementary Table 5. The estimated number of people with and without kidney disease, years of life lived, PALYs and the broader economic cost (in terms of GDP) among Australian females of working age (15-69 years) from 2020 to 2029

Year	Total number of females		Total years of life in females		Total PALYs in females		Total cost in females (US$)	
	Without kidney disease	With kidney disease	Without kidney disease	With kidney disease	Without kidney disease	With kidney disease	Without kidney disease	With kidney disease
2020	8,846,480	240,216	8,366,383	227,753	4,250,757	77,872	$838,499,337,462	$15,360,872,868
2021	8,972,542	242,423	8,081,189	218,884	4,104,109	74,998	$819,022,492,910	$14,966,693,423
2022	9,102,282	244,789	7,806,857	210,436	3,961,429	72,233	$799,671,081,355	$14,581,176,140
2023	9,228,287	247,046	7,540,302	202,317	3,822,441	69,563	$780,416,359,401	$14,202,457,080
2024	9,350,212	249,282	7,278,370	194,443	3,686,599	66,974	$761,171,217,821	$13,828,176,856
2025	9,470,089	251,492	7,021,999	186,843	3,554,301	64,475	$742,040,140,163	$13,460,590,125
2026	9,583,466	253,534	6,770,503	179,456	3,425,560	62,052	$723,050,722,825	$13,097,698,377
2027	9,693,071	255,535	6,523,560	172,279	3,300,342	59,706	$704,220,147,693	$12,739,982,830
2028	9,801,359	257,455	6,283,142	165,339	3,179,089	57,443	$685,668,085,721	$12,389,240,862
2029	9,906,863	259,369	6,049,569	158,643	3,061,671	55,259	$667,393,531,804	$12,045,435,626
Total	**93,954,652**	**2,501,140**	**71,721,874**	**1,916,392**	**36,346,298**	**660,574**	**$7,521,153,117,155**	**$136,672,324,186**
Total (with and without kidney disease)	**96,455,792**		**73,638,266**		**37,006,872**		**$7,657,825,441,341**	

Years of life lived, PALYs and costs were subject to an annual discount rate of 5% applied beyond the first year, and therefore represent discounted values.

CKD: chronic kidney disease, ESRD: end-stage renal disease, GDP: gross domestic product, PALY: productivity-adjusted life years, US$: US dollars.

Supplementary Table 6. The impact of preventing new cases of kidney disease in terms of deaths averted, years of life saved, PALYs saved, and costs saved among Australian males and females of working age (15-69 years) over ten years (2020 to 2029)

Kidney disease incidence (%)*	Total new kidney disease cases avoided		Total deaths averted		Total years of life saved		Total PALYs saved		Total cost saved (US$)	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
90	8,635	7,628	199	105	364	190	4,827	2,763	$1,016,229,196	$581,682,537
80	17,253	15,249	397	209	727	380	9,634	5,517	$2,028,228,617	$1,161,570,529
70	25,853	22,861	595	314	1,090	569	14,421	8,263	$3,035,978,843	$1,739,658,738
60	34,436	30,464	793	418	1,453	759	19,188	11,000	$4,039,460,383	$2,315,941,915
50	43,000	38,060	990	522	1,814	948	23,935	13,729	$5,038,653,673	$2,890,414,798
40	51,547	45,648	1,187	626	2,176	1,137	28,662	16,449	$6,033,539,081	$3,463,072,114
30	60,076	53,227	1,383	730	2,536	1,326	33,368	19,161	$7,024,096,900	$4,033,908,578
20	68,588	60,798	1,579	834	2,896	1,515	38,054	21,864	$8,010,307,351	$4,602,918,893
10	77,081	68,360	1,774	937	3,256	1,703	42,720	24,559	$8,992,150,584	$5,170,097,750
0	85,556	75,914	1,969	1,041	3,614	1,892	47,364	27,245	$9,969,606,674	$5,735,439,827

*Assumes both CKD (defined as Stage 3 to 5 not undergoing RRT) and ESRD (Stage 5 CKD undergoing RRT) incidence were concurrently reduced.

Years of life lived, PALYs and costs were subject to an annual discount rate of 5% applied beyond the first year, and therefore represent discounted values.

CKD: chronic kidney disease, ESRD: end-stage renal disease, PALY: productivity-adjusted life year, RRT: renal replacement therapy, US$: US dollars.

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