ECONOMIC MODELLING OF CHRONIC KIDNEY DISEASE: A SYSTEMATIC LITERATURE REVIEW TO INFORM CONCEPTUAL MODEL DESIGN

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Supplementary Table 17. Summary of unique models: Model setting

Study	Year	Country	Perspective	Time horizon	Type of analysis	Model type	Disease setting	Research question
Axelrod et al.[1]	2003	USA	Third party payer	NR	Decision	Markov model	Renal artery stenosis	Determine the incremental cost-effectiveness of prophylactic percutaneous transluminal angioplasty with stent placement (PTA-S) in patients with incidentally discovered, asymptomatic renal artery stenosis compared to delaying PTA-S until patients develop refractory hypertension or renal insufficiency (therapeutic PTA-S)
Dorenkamp et al.[2]	2013	Germany	Payer	Lifetime	Cost-effectiveness	Markov model	Resistant hypertension	Determine the cost-effectiveness of catheter-based renal sympathetic denervation for the treatment of resistant hypertension separately for men and women of different ages
Gandjour et al.[3]	2007	Germany	Statutory health insurance	35, 45, 55 years	Cost-utility	Markov model	Hypertension	Estimate the cost-effectiveness of a national hypertension treatment program compared to no program
Geisler et al.[4]	2012	UK and Australia	Societal	Lifetime	Cost-effectiveness	Markov model	Resistant hypertension	Assess cost-effectiveness and long-term clinical benefits of renal denervation in resistant hypertensive patients
Marra et al.[5]	2017	Canada	Third party payer	30 years	Cost-effectiveness	Markov model	CVD and/or ESRD	Evaluate the economic impact of observed benefits in trials of pharmacist intervention in blood pressure control, in order to project potential clinical and cost-effectiveness of pharmacist interventions over a longer time horizon
Saito et al.[6]	2008	Japan	Payer	20 years	Cost-utility	Markov model	Hypertension	Analyse the cost-effectiveness of lifetime antihypertensive therapy with angiotensin II receptor blocker (ARB) monotherapy, calcium channel blocker (CCB) monotherapy, or ARB plus CCB (ARB+CCB) combination therapy
Tajeu et al.[7]	2017	USA	Third party payer	Lifetime	Cost-effectiveness	Markov model	Patients receiving hypertensive treatment	Cost-effectiveness of antihypertensive medication treatment versus no-treatment in white and black adults

ARB: angiotensin II receptor blockers; CCB: calcium channel blocker; CVD: cardiovascular disease; NR: not reported; PTA-S: percutaneous transluminal angioplasty and stent.

Supplementary Table 18. Summary of unique models: health states, disease progression, CV events and discount rates

Study	Health states related to kidney disease	Approach used to model CKD progression	Approach used to model CV events	Discounting
Axelrod et al.[1]*	Chronic renal insufficiency, ESRD, and death	Transition probabilities	Transition probabilities, (details of source not reported)	3%
Dorenkamp et al.[2]	Transition to ESRD, death	Transition probabilities	Transition probabilities during first year after a primary event and relative risks more than 1 year after primary event, derived from large registries	3%
Gandjour et al.[3]*	Renal failure, death	Incidence of renal failure with and without hypertension treatment (age dependent)	Incidence and relative risk of death, derived from MONICA study, meta-analysis study and community study	3%
Geisler et al.[4]*	ESRD, death	ESRD incidence	Event probabilities/incidence, derived from Framingham risk equations	3%
Marra et al.[5]*	Alive no CV or renal history, Alive renal history only, Alive CV and renal history, dead	Relative disease risk	CVD probabilities, derived from Framingham studies	5%
Saito et al.[6]*	Microalbuminuria, apparent proteinuria, ESRD, haemodialysis, non-CV death	Percentage/year	Risk estimation equation, derived from Framingham risk equations	3%
Tajeu et al.[7]*	CKD, ESRD, death	Transition probabilities	Transition probabilities, derived from Framingham heart study and REGARDS data	3%

CV: cardiovascular; CVD: cardiovascular disease; ESRD: end-stage renal disease.
**Studies included additional non-renal health states.*

Supplementary Table 19. Summary of unique models: sensitivity analyses and drivers of cost effectiveness

Study	Sensitivity analyses	Drivers of cost-effectiveness	Validation
Axelrod et al.[1]	One-way and two-way	Stent cost, the probability of ipsilateral stenosis progression from moderate to high grade, the probability of the contralateral artery progressing from normal to moderate stenosis, and the frequency of restenosis after PTA-S	NR
Dorenkamp et al.[2]	Deterministic and probabilistic	SBP lowering effect related to renal denervation, the rate of renal denervation non-responders, and the costs associated with the renal denervation procedure	Validated by comparing model-projected life expectancies with actual German life tables
Gandjour et al.[3]	One-way	Annual discount rate and the relative risk of MI under antihypertensive therapy	NR
Geisler et al.[4]	One-way and probabilistic	NR	Assessed the external validity in several ways, including comparing the simulated relative risk of CHD to JNC7- reported relative risks and comparing the predicted MI and stroke incidences for the simulated cohort to the corresponding projections generated by a NICE hypertension model
Marra et al.[5]	One-way and probabilistic	NR	NR
Saito et al.[6]	Conducted, details not provided	NR	NR
Tajeu et al.[7]	One-way, probabilistic and worse-case scenario	Costs of CHD, CKD, and HF	NR

CHD: coronary heart disease; HF: heart failure; JNC7: Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure; MI: myocardial infarction; NICE: National Institute for Health and Care Excellence; NR: not reported; PTA-S: percutaneous transluminal angioplasty and stent; RDN: renal denervation.

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