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5th Emerging Health Policy Research Conference

Cost-effectiveness of kidney disease screening in Australia

~ General and Indigenous populations ~

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100 YEARS AHEAD

BACKGROUND

- In Australia, chronic kidney disease (CKD) accounted for 2.6% of total burden of disease in 2003
- CKD prevalence is estimated at 11% (≥25y)
- Indigenous population are almost 9 times as likely as general population to reach end-stage kidney disease (ESKD; CKD stage 5), and 6 times more likely to receive renal replacement therapy
- CKD accounted for 4% of all deaths among the Indigenous population

CURRENT PRACTICE

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- CKD is often without symptoms until it has reached an advanced stage (ESKD)
- In 2008, 17,578 people were treated for ESKD
  - 10,062 on dialysis
  - 7,516 living with a functioning kidney transplant
- Kidney transplant is the best option in terms of quality of life and cost-effectiveness

  … but limited by the supply of donor organs
- Demand for renal dialysis is increasing

…but very costly, not cost-effective

RESEARCH OBJECTIVES

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- Overall objective

To examine the cost-effectiveness of screening and early treatment of CKD in comparison to the current practice

- Specific objective

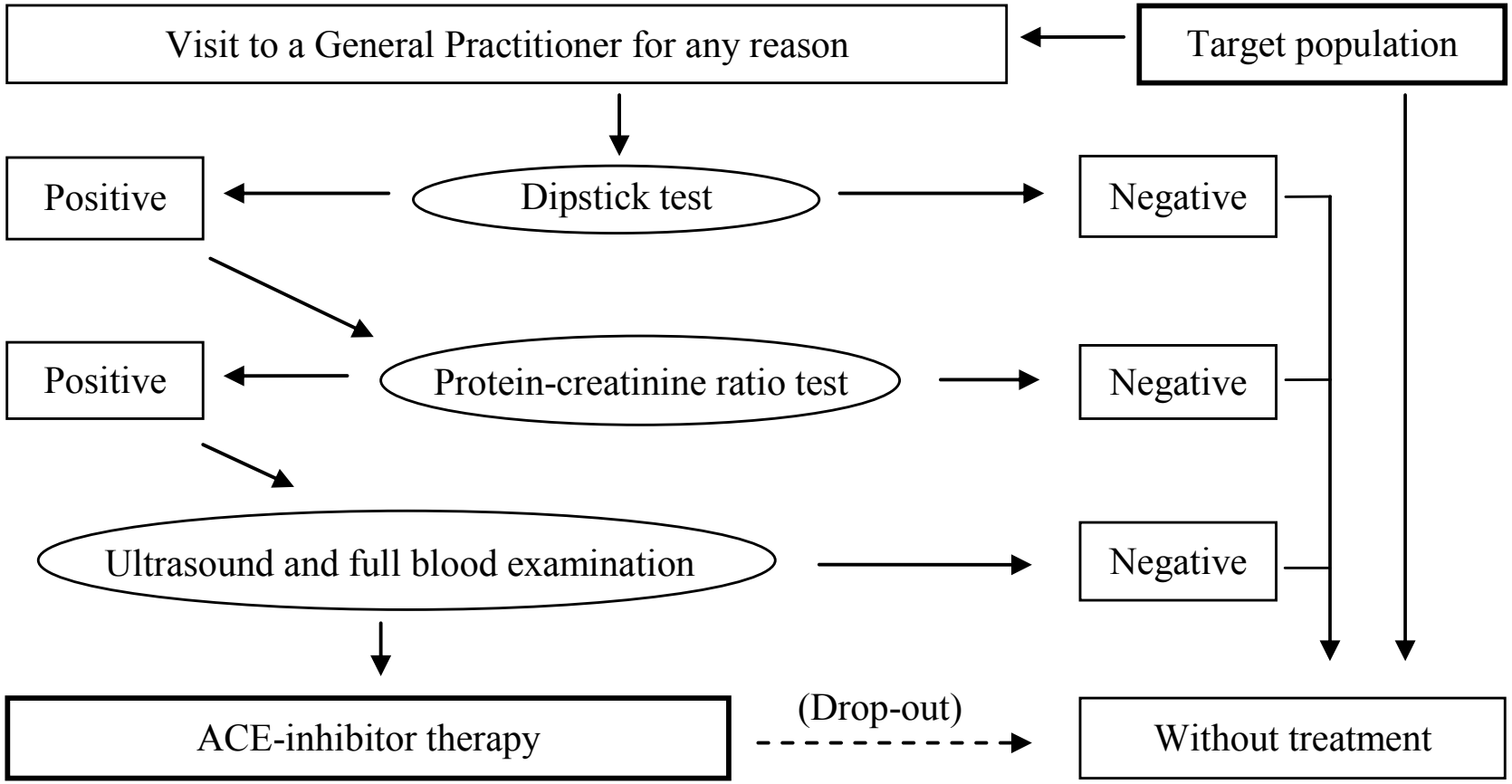
To determine the target-group for CKD screening

METHODS

- Research design: Economic evaluation (cost-effectiveness)
- Base population: 25–79 years of age in 2003
- Perspective: Healthcare perspective
- Model: Markov (multiple cohort, multi-state life table)
- 6 target populations with 3 age-groups each were examined

Target population	Diabetes mellitus	Age-group
General	With	25–39; 40–49; 50–79
	Without	25–39; 40–49; 50–79
Indigenous (remote)	With	25–39; 40–49; 50–79
	Without	25–39; 40–49; 50–79
Indigenous (non-remote)	With	25–39; 40–49; 50–79
	Without	25–39; 40–49; 50–79

INTERVENTION



PARAMETERS & UNCERTAINTY

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- Population: Australian/Indigenous burden of disease study 2003
- Prevalence of protein/albuminuria: AusDiab study 2000/2005 with extra information from literature
- Intervention cost: MBS, AIHW data base, literature etc.
- Cost offset: Disease costing and impact study (2000-01)
- Disease parameter (ESKD + IHD, stroke): Australian/ Indigenous burden of disease study 2003
- Intervention effect: Literature (meta-analysis)
- Outcome measurement: Disability-adjusted life year (DALY)
- Discount rate: 3% for both cost and effect
- Uncertainty analysis: Monte Carlo simulation (2,000 iterations)

RESULTS (General population)

Target population age-group	ICER AUD/DALY averted (95% UI)	Probability of being <AUD 50,000/DALY
Diabetes mellitus		
50-79	Dominant (Dominant – 8,000)	100%
40-49	4,000 (Dominant – 18,000)	100%
25-39	8,000 (1,000 – 23,000)	100%
Non-diabetes mellitus		
50-79	13,000 (Dominant – 41,000)	99%
40-49	34,000 (16,000 – 68,000)	88%
25-39	49,000 (28,000 – 93,000)	52%

ICER: incremental cost-effectiveness ratio; UI: uncertainty interval

RESULTS (Indigenous population)

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Target population	age-group	ICER AUD/DALY averted (95% UI)	Probability of being <AUD 50,000/DALY
Diabetes mellitus			
Non-remote	50-79	Dominant (Dominant – Dominant)	100%
	40-49	Dominant (Dominant – 10,000)	100%
	25-39	4,200 (Dominant – 19,000)	100%
Remote	50-79	Dominant (Dominant – Dominant)	100%
	40-49	4,000 (Dominant – 20,000)	100%
	25-39	13,000 (3,000 – 31,000)	100%
Non-diabetes mellitus			
Non-remote	50-79	Dominant (Dominant – 12,000)	100%
	40-49	17,000 (0 – 48,000)	98%
	25-39	36,000 (17,000 – 72,000)	82%
Remote	50-79	Dominant (Dominant – 20,000)	100%
	40-49	17,000 (4,000 – 42,000)	99%
	25-39	30,000 (15,000 – 59,000)	93%

SCATTERPLOT ON THE COST-EFFECTIVENESS PLANE

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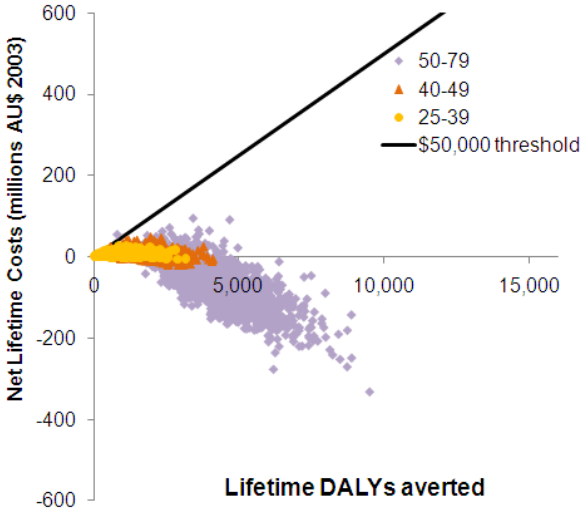
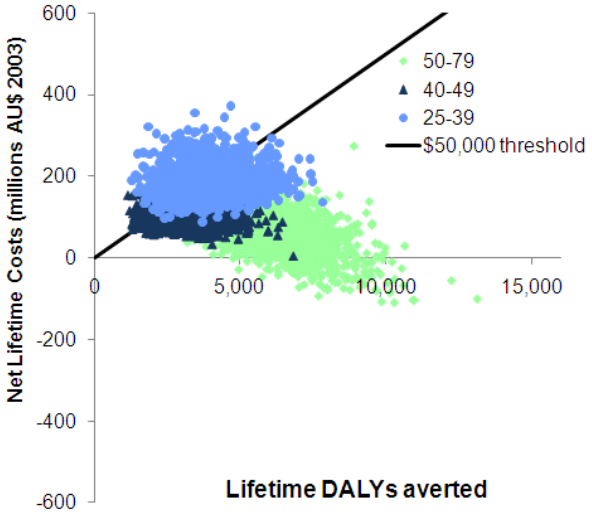
Diabetes mellitus

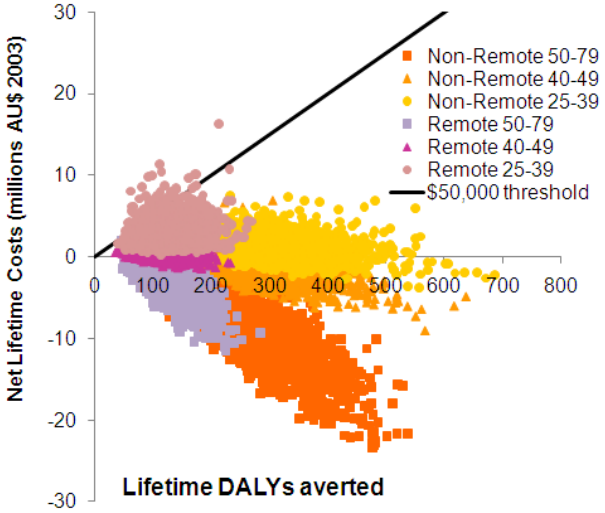
Non-diabetes mellitus

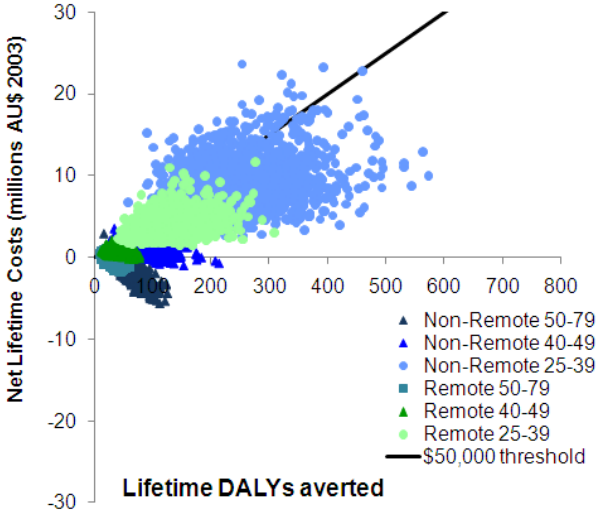
General population





Indigenous population





100 YEARS AHEAD

EXPANSION PATHWAY

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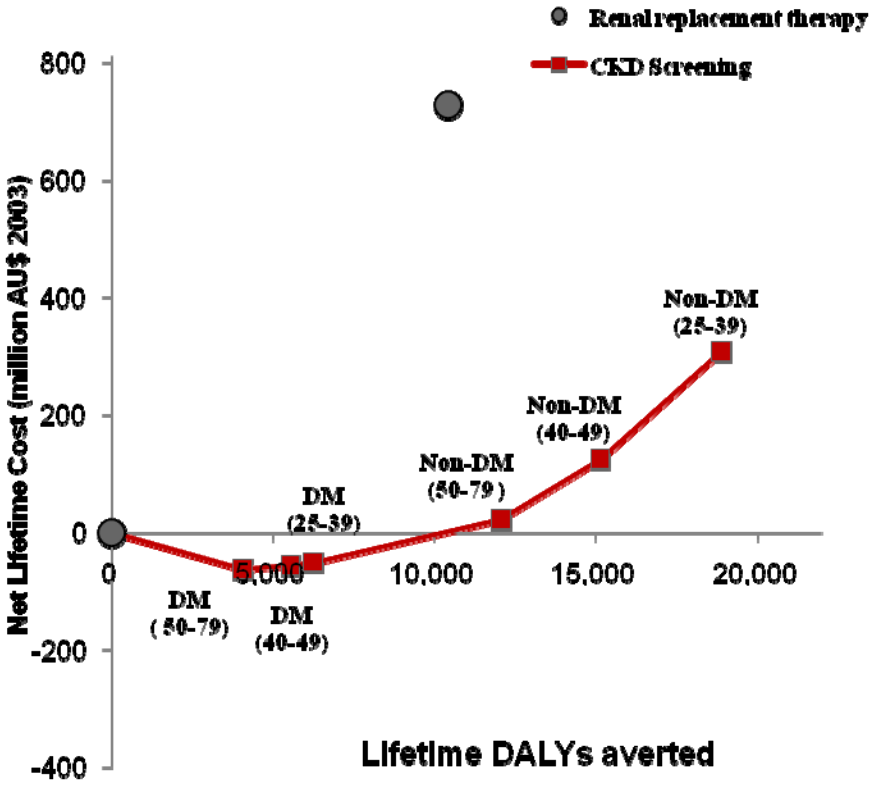
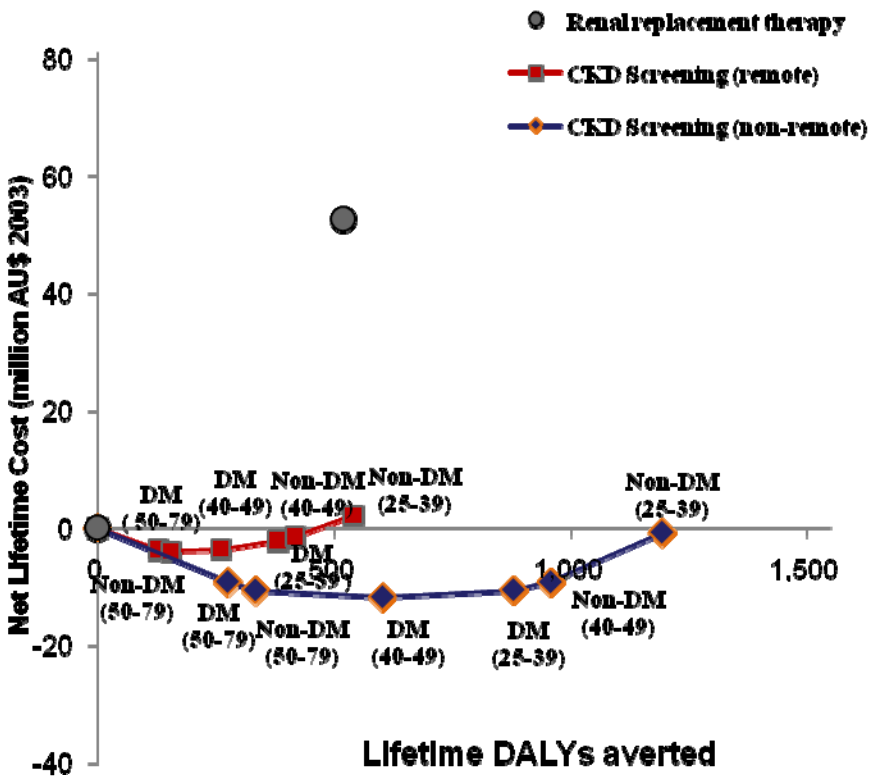
General population



Indigenous population



100 YEARS AHEAD

POLICY RECOMMENDATIONS

- Interventions for people with diabetes mellitus are cost-effective (or cost-saving) for both general and Indigenous population at all age-groups

  CKD screening recommended for people with diabetes mellitus at all age-groups

- Interventions for Indigenous people without diabetes mellitus are also cost-effective (or cost-saving) at all age-groups

  CKD screening recommended for Indigenous people without diabetes mellitus at all age-groups

- The inclusion of general population without diabetes mellitus is less cost-effective at younger age-groups

  CKD screening may be limited to higher age-groups (≥50)

ALBUMINURIA SCREENING

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- Guidelines for people with diabetes mellitus have recommended microalbuminuria screening (in stead of proteinuria screening)
- Discussion is underway on the move away from proteinuria screening towards microalbuminuria screening for all people
- However, progression from micro to macroalbuminuria is slow (about 8% for non-diabetes and 14% for diabetes over five years*), and so we may provide excessive treatments for people without diabetes
- Modifying the proteinuria screening model to albuminuria screening requires further detailed epidemiological information, different approach (discrete-event micro-simulation model), and extra funding

*Author's calculation from AusDiab study 2000 and 2005 data

Thanks!

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