

Comparison of Survival among Older Adults with Kidney Failure Treated versus Not Treated with Chronic Dialysis

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INTRODUCTION

Treatment for older adults with kidney failure generally includes chronic dialysis or non-dialysis care.

Prior studies comparing survival among dialysis and non-dialysis care have been limited by the following ^{1,2}:

- Single-center studies managed by nephrology teams
- Considerable differences in baseline characteristics
- Potential for lead-time and immortal time biases

AIM

To compare time to all-cause mortality among older adults with kidney failure treated versus not treated with chronic dialysis, addressing treatment-selection, lead-time, and immortal time biases

METHODS

- We used linked administrative and laboratory databases to identify adults aged ≥ 65 in Alberta with kidney failure from 2002-2012
- Kidney failure defined by ≥ 2 consecutive outpatient eGFR measurements of < 10 ml/min/1.73m² spanning a period of ≥ 90 days (figure 1)
- Cox regression modeling with propensity score matching to account for baseline demographic and comorbid differences
- A time-varying exposure was used to address immortal time bias

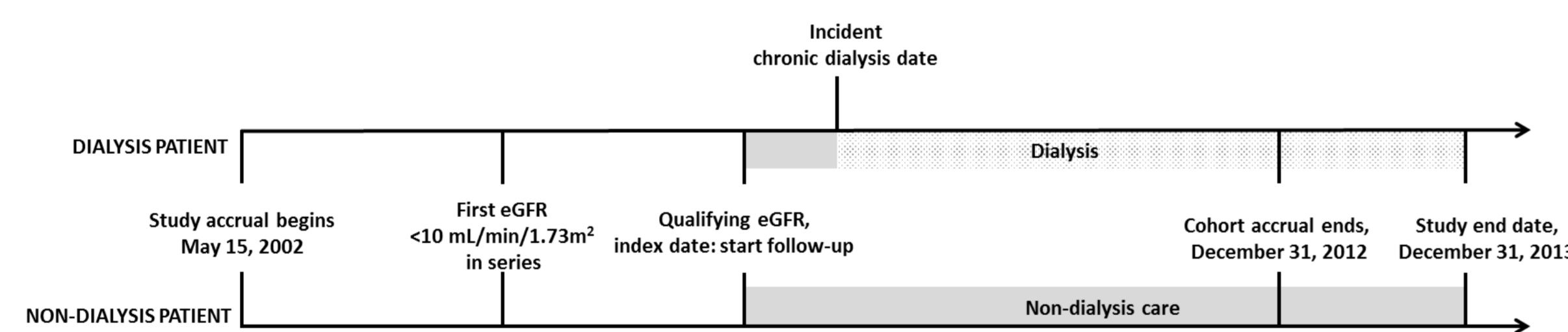


Figure 1. Study design

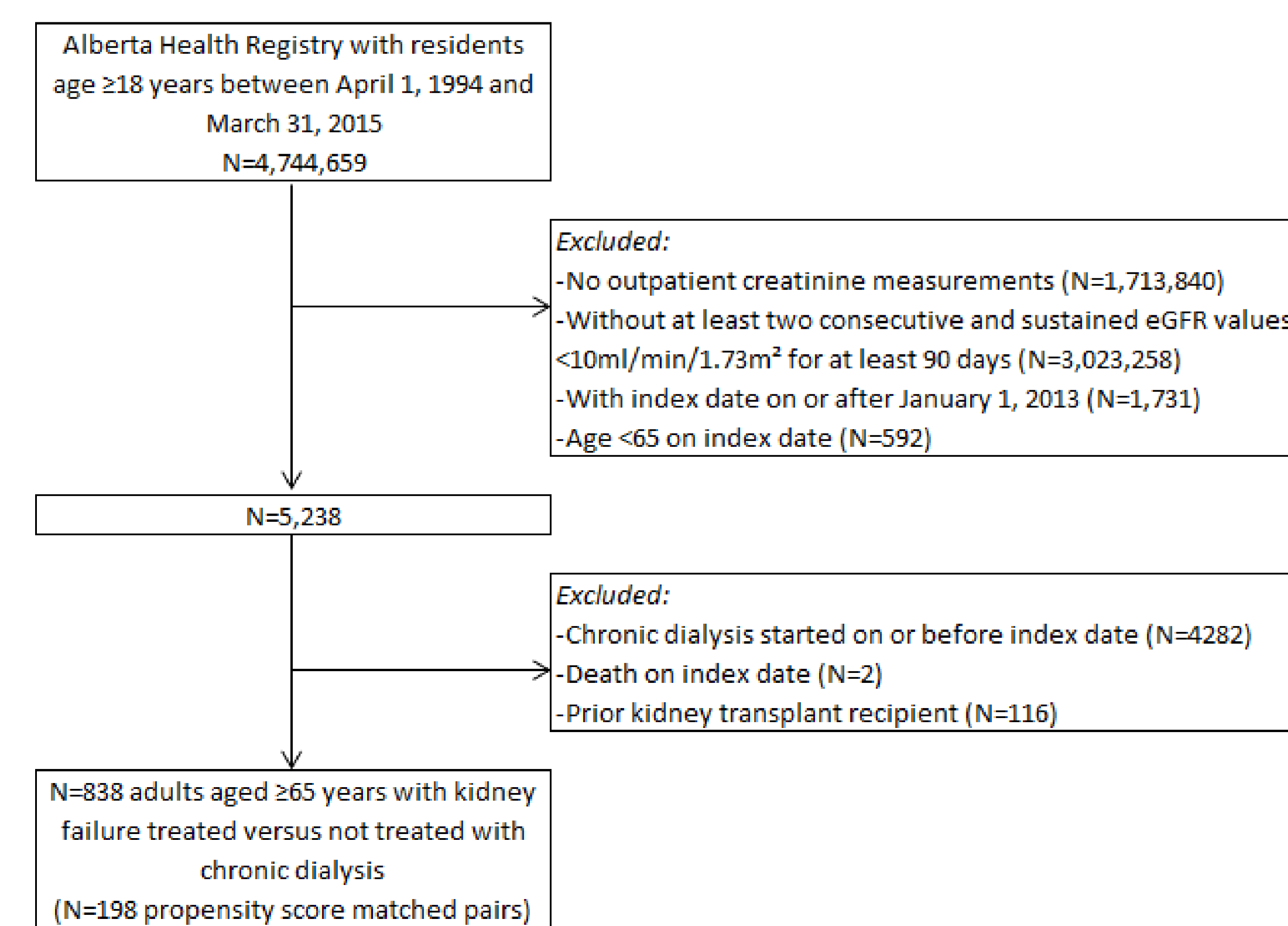


Figure 2. Cohort formation

RESULTS

- 838 patients met cohort inclusion criteria (figure 2)
- 396 (47.3%) were included in the final propensity score matched cohort
- The balance of covariates between the two groups improved after propensity score matching (table 1)
- The mean standardized differences in covariates decreased from 22.5% (range 0.2 to 99.9%) before matching to 2.8% (0.0 to 9.1%) after matching, achieving balance across all included covariates (figures 3 and 4)
- Mean age 80.4, 44.7% male, mean eGFR 7.8 ml/min/1.73m²

Table 1. Baseline characteristics

Characteristic	Entire cohort (N=838)			After propensity score matching (N=396)		
	Dialysis N=500	Non-dialysis N=338	Standardized difference (%)	Dialysis N=198	Non-dialysis N=198	Standardized difference (%)
Male	273 (54.6)	134 (39.6)	30.3	88 (44.4)	89 (45.0)	-1.0
Mean age (SD)	76.3 (6.4)	83.2 (7.2)	-99.9	80.6 (6.3)	80.2 (6.8)	5.7
Mean eGFR at index (SD)	7.8 (1.4)	7.7 (1.6)	2.6	7.8 (1.5)	7.8 (1.4)	-0.9
Comorbidities						
Dementia	26 (5.2)	82 (24.3)	-55.8	24 (12.1)	20 (10.1)	6.4
Myocardial infarction	74 (14.8)	68 (20.1)	-14.0	34 (17.2)	33 (16.7)	1.3
Diabetes	273 (54.6)	173 (51.2)	6.8	102 (51.5)	101 (51.0)	1.0
Hypertension	482 (96.4)	309 (91.4)	20.9	185 (93.4)	184 (92.9)	2.0

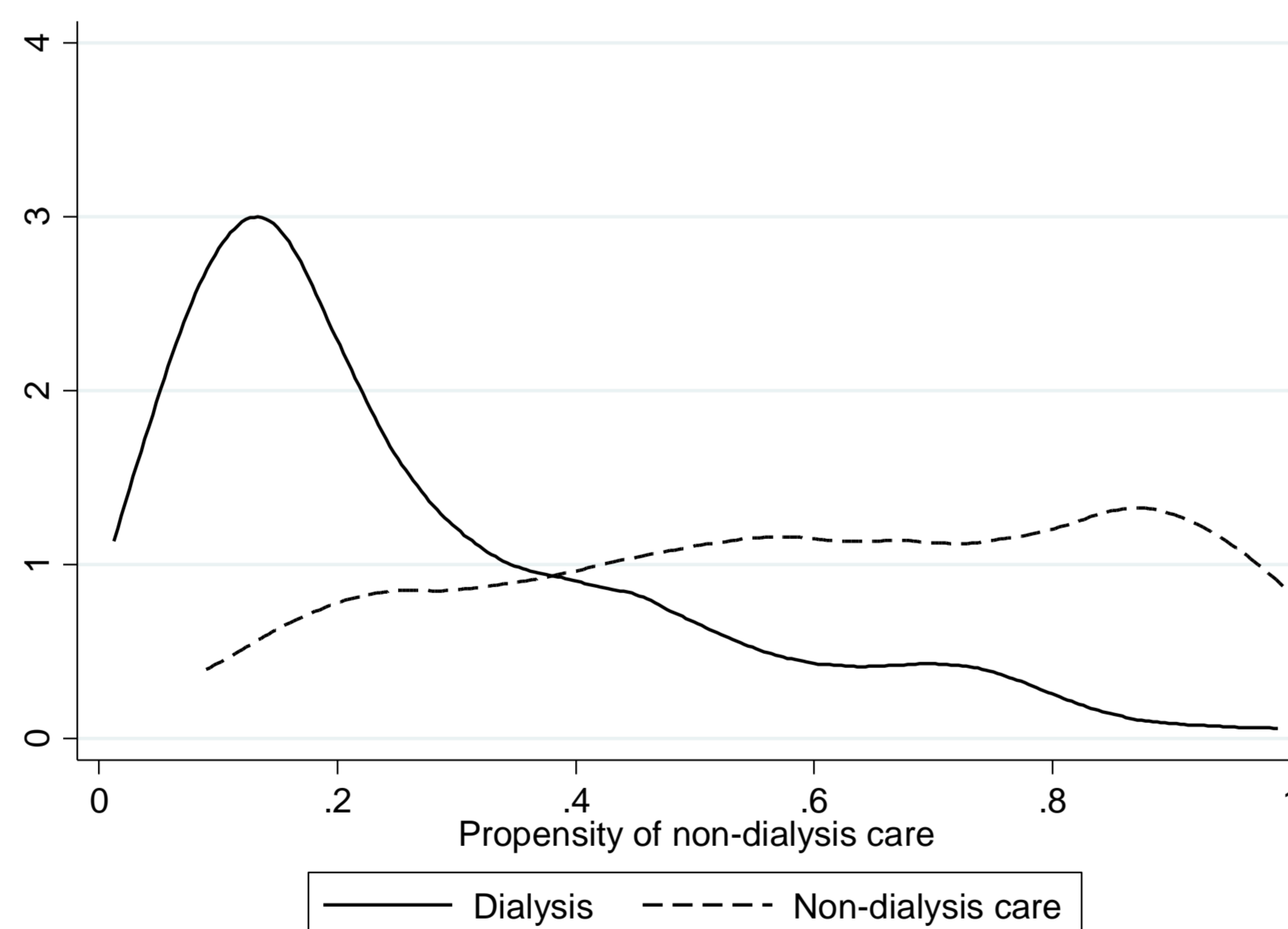


Figure 3. Pre-propensity score matched cohort

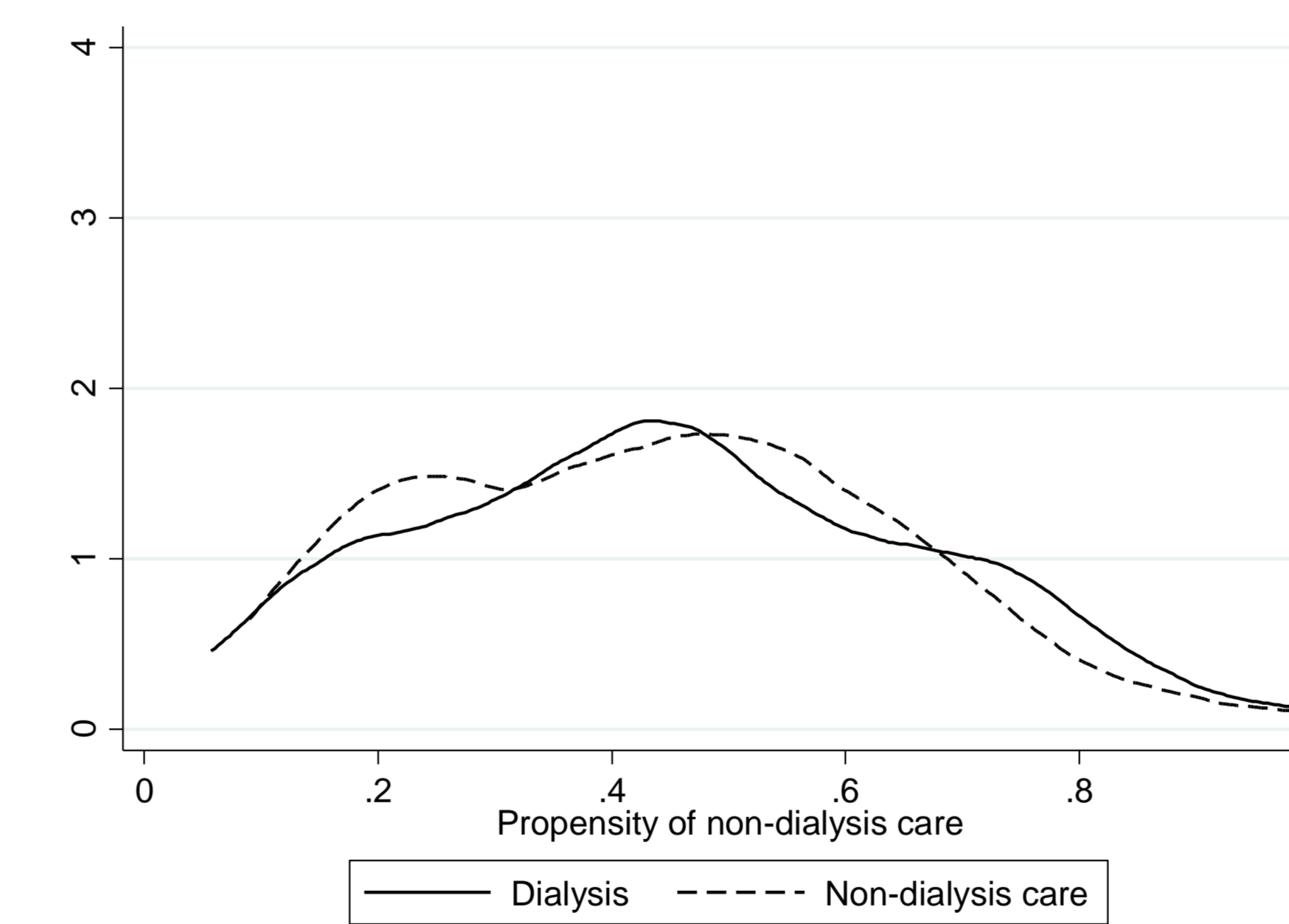


Figure 4. Post-propensity score matched cohort

STRENGTHS & LIMITATIONS

- We used a population-based cohort, and were able to account for clinically important baseline characteristics
- Using an eGFR-based algorithm to identify does not fully address lead-time bias, and potential for misclassification bias

CONCLUSIONS

- Among older adults with kidney failure defined by sustained eGFR < 10 ml/min/1.73m², dialysis may confer a reduced risk of all-cause mortality within the first 3 years of treatment
- The information generated about survival regarding early mortality may support shared treatment decision-making within nephrology and primary care settings when managing older adults with kidney failure

- Compared to non-dialysis, there was a reduction in risk of death among those treated with dialysis within the first 3 years of follow-up: HR 0.55 (95% CI 0.41 to 0.74)
- However, after 3 years, dialysis no longer conferred a survival advantage: HR 2.30 (95% CI 1.11 to 4.81) (figure 5)
- The results were robust in a number of sensitivity analyses:
 - ✓ Excluding patients with late referral to a nephrologist
 - ✓ Excluding patients not referred to a nephrologist
 - ✓ Exclude patients with improved kidney function post-cohort entry

Table 2. Hazard ratios of mortality from primary and sensitivity analyses

PS-matched cohort	Dialysis	Non-dialysis	N	HR	95% CI	p-value
0-3 years of follow-up						
Full PS-matched cohort	198	198	396	0.55	0.41-0.74	<0.001
Exclude late referral to nephrologist	182	182	364	0.53	0.39-0.73	<0.001
Exclude non-referred to nephrologist	186	186	372	0.60	0.44-0.81	0.001
Exclude improved kidney function post-cohort entry	193	193	386	0.49	0.36-0.68	<0.001
≥ 3 years of follow-up						
Full PS-matched cohort	198	198	396	2.30	1.11-4.81	0.026
Exclude late referral to nephrologist	182	182	364	1.96	0.89-4.32	0.096
Exclude non-referred to nephrologist	186	186	372	3.53	1.52-8.21	0.003
Exclude improved kidney function post-cohort entry	193	193	386	2.17	1.00-4.71	0.050

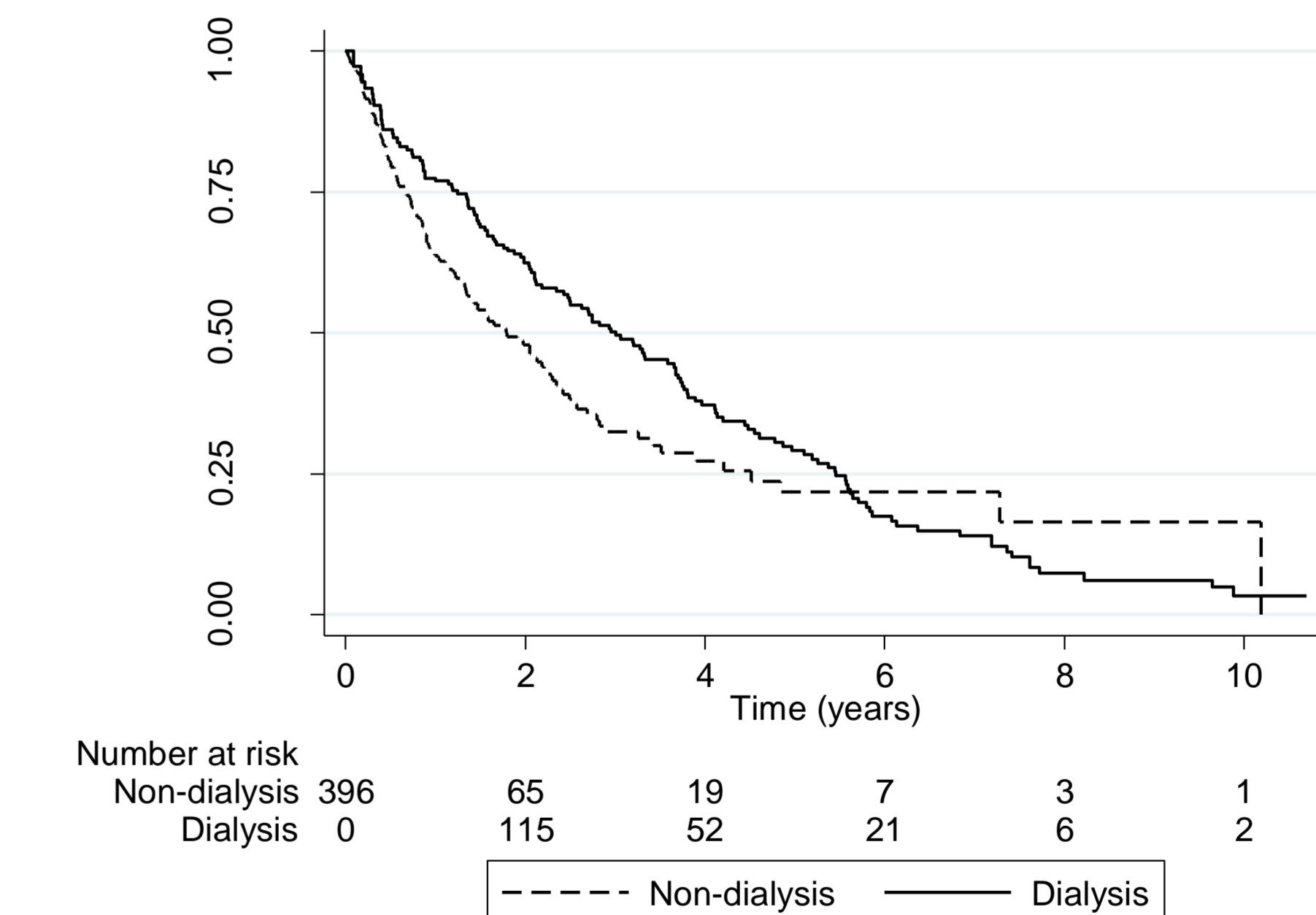


Figure 5. Kaplan-Meier survival curves

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