

Supporting Information

Supplementary results

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Appendix to: Yap ML, O'Connell DL, Goldsbury DE, et al. Patterns of care for men with prostate cancer: the 45 and Up Study. *Med J Aust* 2021; doi: 10.5694/mja2.50966.

Table 1. Characteristics associated with radical prostatectomy or external beam radiotherapy for prostate cancer diagnosed in 4003 men in New South Wales, 2006–2013; adjusted for age and stage of disease

	Subdistribution hazard ratio (95% CI)				
	Number	Radical prostatectomy	P	External beam radiotherapy	P
Socio-demographic factors					
Relationship status			< 0.001		0.26
Married/partnered	3262 (81%)	1		1	
Single	701 (18%)	0.61 (0.52-0.71)		1.08 (0.94–1.25)	
Missing data	40 (1%)	_		_	
Number of children			0.013		0.33
0	354 (9%)	0.79 (0.66-0.95)		0.91 (0.74–1.11)	
1 or more	3602 (90%)	1		1	
Missing data	47 (1%)	_		_	
Role as a carer for sick other			0.73		0.75
No	3528 (88%)	1		1	
Yes	360 (9%)	1.03 (0.87–1.23)		1.03 (0.85–1.25)	
Missing data	115 (3%)	_		_	
Place of residence			0.06		0.025
Major cities	2017 (50%)	1		1	
Inner regional	1474 (37%)	0.93 (0.83-1.03)		1.10 (0.98–1.24)	
Outer regional/remote/very remote	512 (13%)	1.12 (0.96–1.30)		0.87 (0.73–1.04)	
Distance from nearest radiotherapy centre			< 0.001		< 0.001
< 100 km	3336 (83%)	1		1	
≥ 100 km	632 (16%)	1.30 (1.14–1.48)		0.72 (0.61–0.84)	
Missing data	35 (1%)				
Migrant status			0.18		0.98
Non-migrant	3048 (76%)	1		1	
Migrant	918 (23%)	0.92 (0.82-1.04)		1.00 (0.88–1.14)	
Missing data	37 (1%)				
Ancestry			0.39		0.37
Australia/UK/Northwest Europe	3483 (87%)	1		1	
Asia/Middle East/Eastern Europe/Other	490 (12%)	0.94 (0.81–1.08)		1.08 (0.91–1.28)	
Missing data	30 (1%)				
Language other than English			0.10		0.96
No	3683 (92%)	1		1	
Yes	320 (8%)	0.87 (0.74–1.03)		0.99 (0.81–1.22)	
Socio-economic characteristics					
Area level socio-economic status*					
Quintile 1 (Least disadvantaged)	696 (17%)	1	< 0.001	1	0.035
Quintile 2	628 (16%)	0.91 (0.77–1.08)		1.06 (0.87–1.29)	
Quintile 3	899 (22%)	0.74 (0.63-0.86)		1.25 (1.05–1.49)	
Quintile 4	1074 (27%)	0.91 (0.78–1.06)		1.00 (0.84,1.19)	
Quintile 5 (Most disadvantaged)	706 (18%)	0.74 (0.63-0.88)		1.05 (0.87–1.27)	
Yearly household income			< 0.001		0.30
< \$20 000	882 (22%)	0.64 (0.54-0.76)		1.09 (0.90–1.30)	
\$20 000–39 999	833 (21%)	0.85 (0.73-0.99)		1.21 (1.02–1.45)	
\$40 000–69 999	780 (19%)	0.96 (0.84-1.10)		1.08 (0.90–1.29)	
≥ \$70 000	869 (22%)	1		1	
Rather not answer	639 (16%)	0.82 (0.70-0.97)		1.10 (0.90-1.33)	

		Subdistribution hazard ratio (95% CI)			
	Number	Radical prostatectomy	Р	External beam radiotherapy	P
Education level			0.15		0.17
University degree	901 (23%)	1		1	
Diploma	778 (19%)	0.98 (0.85–1.13)		1.08 (0.91–1.29)	
Trade apprenticeship	762 (19%)	0.97 (0.83–1.13)		1.19 (1.00–1.41)	
Higher school certificate	362 (9%)	0.83 (0.68–1.00)		1.04 (0.83-1.30)	
School certificate	655 (16%)	0.84 (0.71–0.99)		1.11 (0.92–1.32)	
No school certificate	470 (12%)	0.90 (0.75–1.07)		0.92 (0.75–1.14)	
Missing data	75 (2%)				
Current employment status			0.05		0.003
Retired	1930 (48%)	1		1	
Fulltime	844 (21%)	1.20 (1.03–1.39)		0.75 (0.63-0.91)	
Other	1229 (31%)	1.08 (0.94–1.24)		1.02 (0.89–1.16)	
Health insurance status			< 0.001		< 0.001
Private health insurance	2649 (66%)	1		1	
No private	1269 (32%)	0.60 (0.54-0.67)		1.27 (1.13–1.42)	
Missing data	85 (2%)				
Health characteristics					
Charlson comorbidity index					0.003
0	3526 (88%)	1	0.015	1	
1	226 (6%)	0.86 (0.66–1.11)		0.86 (0.67–1.11)	
2 or more	171 (4%)	0.60 (0.42-0.87)		0.58 (0.41–0.80)	
Missing data	80 (2%)				
Need help with daily tasks					0.42
No	3721 (93%)	1	0.004	1	
Yes	113 (3%)	0.67 (0.46-0.99)		0.87 (0.61–1.23)	
Missing data	169 (4%)	0.67 (0.49-0.90)		1.14 (0.89–1.46)	
MOS SF-36 physical functioning scale (PF-10) [†]			< 0.001		0.08
100	1115 (28%)	1		1	
90–99	1229 (31%)	0.96 (0.85–1.08)		1.16 (1.00–1.34)	
60–89	956 (23%)	0.74 (0.64-0.86)		1.20 (1.02–1.41)	
0–59	386 (10%)	0.61 (0.49-0.76)		1.10 (0.89–1.36)	
Unspecified/invalid	317 (8%)	0.75 (0.61–0.94)		0.95 (0.75–1.19)	
Body mass index			< 0.001		0.55
Underweight/normal	1155 (29%)	1		1	
Overweight	1856 (46%)	1.03 (0.92–1.16)		1.00 (0.88–1.14)	
Obese	730 (18%)	0.78 (0.67-0.90)		1.05 (0.90-1.24)	
Missing data	262 (7%)	0.87 (0.70–1.10)		0.88 (0.69–1.11)	

CI = confidence interval.

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^{*} Socio-economic Indexes for Areas (SEIFA), Index of Relative Socioeconomic Disadvantage 2006.1

[†] The MOS 36-item short-form health survey (SF-36).²

Proportional hazards assumptions

Proportional hazards assumptions for undergoing radical prostatectomy or external beam radiotherapy (EBRT) were examined by visual inspection of the cumulative incidence curves stratified by the variables of interest and log-negative-log survival plots and a statistical test of zero slope for the Schoenfeld residuals using Stata 16.0.

For time to radical prostatectomy and EBRT based on the test for the Schoenfeld residuals, there was some evidence of non-proportionality of hazards for age and stage at diagnosis and distance from a radiotherapy centre. In most cases, because of the large sample size and high power to detect small departures from proportional hazards, non-proportionality was statistically significant, despite no meaningful differences being apparent from visual inspection of the plots. To investigate this further, we conducted the multivariable analysis for each outcome at three and 12 months of follow-up.

There was a suggestion that the likelihood of radical prostatectomy decreased with time since diagnosis for older patients, although very few aged 80 or more received it at any time. Compared with those with localised disease, patients with unknown stage cancer were less likely to have radical prostatectomy in the first 12 months after diagnosis, but there was no significant difference after 12 months. Patients without private health insurance were significantly less likely than those with health insurance to have a radical prostatectomy within the first three months after diagnosis but there was no significant difference after three months (Table 2).

Compared with patients with localised disease at diagnosis, those with distant stage cancer were more likely to receive EBRT up to three months after diagnosis but there were no significant differences after 3 months and patients with regional or unknown stage disease were more likely to receive EBRT by three months after diagnosis (Table 3).

Table 2. Multivariable analysis of characteristics associated with undergoing radical prostatectomy, by follow-up time, for 3774 men in NSW with prostate cancer diagnosed during 2006–2013

	Main analysis:	Follow-up time (SHR, 95% CI)		
	SHR (95% CI)	0–3 months > 3–12 months		> 12 months
Age at diagnosis (years)	P < 0.001	P < 0.001	P < 0.001	P < 0.001
45–59	1.32 (1.16–1.51)	1.19 (1.01–1.41)	1.57 (1.25–1.98)	2.02 (1.29–3.16)
60–69	1	1	1	1
70–79	0.37 (0.31-0.43)	0.47 (0.39–0.57)	0.28 (0.21–0.38)	0.23 (0.13-0.41)
80 or more	0.003 (0.001–0.02)	0.008 (0.001–0.06)	NA*	NA*
Stage	P < 0.001	P < 0.001	P < 0.001	P = 0.77
Localised	1	1	1	1
Regional	2.87 (2.51–3.29)	2.66 (2.31–3.07)	3.77 (2.71–5.26)	1.30 (0.37–4.55)
Distant	0.29 (0.14-0.61)	0.48 (0.23–1.00)	NA*	NA*
Unknown	0.36 (0.31–0.41)	0.12 (0.09–0.16)	0.58 (0.48–0.71)	1.13 (0.78–1.65)
Charlson comorbidity index	P = 0.29	P = 0.62	P = 0.62	P = 0.47
0	1	1	1	1
1	0.97 (0.76–1.25)	0.90 (0.64–1.26)	0.91 (0.57–1.46)	1.27 (0.53–3.02)
2 or more	0.73 (0.49–1.08)	0.82 (0.49–1.36)	0.73 (0.37–1.44)	0.33 (0.04–2.44)
Body mass index	P = 0.008	P = 0.09	P = 0.05	P = 0.60
Underweight/normal	1	1	1	1
Overweight	1.02 (0.90–1.14)	1.06 (0.91–1.22)	0.91 (0.73–1.14)	1.14 (0.73–1.76)
Obese	0.80 (0.69-0.94)	0.86 (0.71–1.04)	0.67 (0.50–0.90)	0.94 (0.53–1.66)
Missing data	0.91 (0.72–1.15)	0.86 (0.64–1.14)	0.99 (0.67–1.48)	0.60 (0.20–1.76)
MOS SF–36 Physical Functioning Scale (PF–10) [†]	P = 0.024	P = 0.29	P = 0.22	P = 0.10
100	1	1	1	1
90–99	0.97 (0.86–1.10)	0.96 (0.82–1.11)	0.96 (0.77–1.21)	0.84 (0.54–1.30)
60–89	0.82 (0.70-0.96)	0.88 (0.72–1.06)	0.76 (0.57–1.00)	0.46 (0.25–0.84)
0–59	0.73 (0.57–0.93)	0.70 (0.50-0.99)	0.75 (0.50–1.11)	0.51 (0.23–1.15)
Unspecified	0.88 (0.71–1.10)	0.91 (0.69–1.21)	0.76 (0.50–1.15)	0.84 (0.41–1.71)
Partner/marital status	P < 0.001	P = 0.022	<i>P</i> < 0.001	P = 0.11
Partner/married	1	1	1	1
Single	0.71 (0.60–0.83)	0.79 (0.65–0.97)	0.59 (0.45–0.78)	0.63 (0.36–1.11)
Distance from nearest radiotherapy centre	P < 0.001	P = 0.006	P = 0.029	P = 0.012
< 100 km	1	1	1	1
≥ 100 km	1.45 (1.21–1.74)	1.37 (1.09–1.71)	1.42 (1.04–1.95)	2.03 (1.17–3.53)
Place of residence	P = 0.93	P = 0.40	P = 0.22	P = 0.89
Major cities	1	1	1	1
Inner regional	0.98 (0.86–1.12)	1.12 (0.95–1.31)	0.82 (0.65–1.03)	0.90 (0.56–1.44)
Outer regional/remote/very remote	1.01 (0.81–1.26)	1.11 (0.84–1.47)	0.89 (0.60–1.32)	0.89 (0.43–1.81)
Area level socio-economic status‡	P = 0.013	P = 0.002	P = 0.34	P = 0.48
Quintile 1 (least disadvantaged)	1	1	1	1
Quintile 2	0.99 (0.83–1.17)	0.87 (0.71–1.06)	1.35 (0.96–1.89)	0.93 (0.50-1.74)
Quintile 3	0.78 (0.66–0.92)	0.65 (0.53-0.81)	1.21 (0.86–1.69)	0.61 (0.34–1.10)
Quintile 4	0.90 (0.75–1.07)	0.78 (0.64–0.97)	1.33 (0.94–1.87)	0.75 (0.40–1.43)
Quintile 5 (most disadvantaged)	0.80 (0.65-0.97)	0.72 (0.57–0.91)	1.11 (0.77–1.61)	0.65 (0.31–1.32)

	Main analysis:	Follow-up time (SHR, 95% CI)			
	SHR (95% CI)	0–3 months	> 3–12 months	> 12 months	
Yearly household income	P = 0.73	P = 0.53	P = 0.67	P = 0.46	
< \$20 000	1.06 (0.86–1.31)	0.90 (0.68–1.19)	1.34 (0.91–1.97)	1.88 (0.90-3.91)	
\$20 000–\$39 999	1.09 (0.91–1.30)	1.03 (0.83–1.27)	1.19 (0.85–1.68)	1.58 (0.88–2.84)	
\$40 000–\$69 999	1.10 (0.94–1.27)	1.09 (0.92–1.29)	1.13 (0.85–1.49)	1.19 (0.69–2.04)	
≥ \$70 000	1	1	1	1	
Rather not answer/missing data	1.01 (0.85–1.21)	0.94 (0.76–1.16)	1.11 (0.79–1.56)	1.61 (0.82–3.14)	
Health insurance status	P < 0.001	P < 0.001	P = 0.06	P = 0.016	
Private insurance	1	1	1	1	
No private insurance	0.67 (0.59–0.77)	0.47 (0.39–0.57)	1.23 (0.99–1.54)	0.54 (0.32-0.89)	
Current employment status	P = 0.70	P = 0.45	P = 0.54	P = 0.58	
Retired	1	1	1	1	
Fulltime	1.05 (0.89–1.24)	1.01 (0.82–1.23)	1.14 (0.83–1.55)	1.24 (0.66–2.31)	
Other	1.06 (0.92–1.22)	1.09 (0.92–1.29)	0.99 (0.76–1.28)	0.95 (0.58–1.55)	

CI = confidence interval; NA = not applicable; SHR = sub-distribution hazard ratio.

* Patients more than 80 years old or with distant metastases excluded because of very low numbers undergoing radical prostatectomy more than three months after diagnosis.

[†] The MOS 36-item short-form health survey (SF-36).²

[‡] Socio-economic Indexes for Areas (SEIFA), Index of Relative Socioeconomic Disadvantage 2006. 1

Table 3. Multivariable analysis of characteristics associated with undergoing radiotherapy, by follow-up time, by follow-up time, for 3774 men in NSW with prostate cancer diagnosed during 2006–2013

	Main analysis:	sis: Follow-up time (SHR, 95% CI)		
	SHR (95% CI)	0–3 months	0–3 months > 3–12 months	
Age at diagnosis (years)	P < 0.001	P < 0.001	P < 0.001	P = 0.001
45–59	0.59 (0.48-0.72)	0.45 (0.17–1.17)	0.53 (0.39–0.71)	0.64 (0.47–0.87)
60–69	1	1	1	1
70–79	1.66 (1.45–1.92)	2.23 (1.40-3.54)	1.85 (1.54–2.21)	1.18 (0.91–1.53)
80 or more	0.71 (0.56–0.90)	1.53 (0.84–2.80)	0.59 (0.42-0.83)	0.74 (0.49–1.10)
Stage	P < 0.001	P < 0.001	P = 0.032	P < 0.001
Localised	1	1	1	1
Regional	1.58 (1.34–1.87)	0.62 (0.29-1.35)	1.29 (1.02–1.65)	2.61 (2.00–3.41)
Distant	2.32 (1.64–3.27)	7.52 (4.22–13.42)	1.47 (0.91–2.38)	1.50 (0.72–3.11)
Unknown	1.21 (1.06–1.37)	0.97 (0.64–1.47)	1.21 (1.03–1.42)	1.31 (1.04–1.65)
Charlson comorbidity index	P = 0.002	P = 0.80	P = 0.004	P = 0.21
0	1	1	1	1
1	0.80 (0.61–1.05)	0.86 (0.42–1.78)	0.80 (0.57–1.12)	0.80 (0.49–1.30)
2 or more	0.56 (0.40-0.79)	0.79 (0.36–1.75)	0.47 (0.29–0.75)	0.62 (0.35–1.12)
Body mass index	P = 0.20	P = 0.46	P = 0.10	P = 0.91
Underweight/normal	1	1	1	1
Overweight	0.99 (0.86–1.13)	0.73 (0.49–1.10)	1 (0.84–1.19)	1 (0.79–1.27)
Obese	1.08 (0.91–1.28)	0.89 (0.54–1.48)	1.14 (0.91–1.42)	1.02 (0.75–1.39)
Missing data	0.80 (0.62–1.04)	1.04 (0.53–2.05)	0.72 (0.50–1.03)	0.86 (0.56–1.33)
MOS SF–36 Physical Functioning Scale (PF–10)*	P = 0.12	P = 0.81	P = 0.12	P = 0.50
100	1	1	1	1
90–99	1.13 (0.97–1.32)	0.87 (0.54–1.40)	1.13 (0.92–1.39)	1.20 (0.92–1.55)
60–89	1.13 (0.95–1.34)	0.77 (0.45–1.33)	1.15 (0.92–1.43)	1.18 (0.87–1.60)
0–59	0.98 (0.78–1.24)	1.05 (0.54–2.05)	0.97 (0.72–1.32)	0.93 (0.61–1.44)
Unspecified	0.88 (0.69–1.13)	0.80 (0.38–1.71)	0.79 (0.57–1.10)	1.01 (0.66–1.54)
Partner/marital status	P = 0.12	P = 0.43	P = 0.28	P = 0.12
Partner/married	1	1	1	1
Single	1.12 (0.97–1.30)	0.83 (0.52–1.33)	1.11 (0.92–1.35)	1.22 (0.95–1.57)
Distance from nearest radiotherapy centre	P < 0.001	P = 0.015	P < 0.001	P = 0.48
< 100 km	1	1	1	1
≥ 100 km	0.66 (0.53-0.81)	2.39 (1.18–4.85)	0.44 (0.33–0.59)	0.88 (0.63–1.25)
Place of residence	P = 0.20	P = 0.009	P = 0.18	P = 0.20
Major cities	1	1	1	1
Inner regional	1.13 (0.99–1.30)	0.47 (0.29–0.77)	1.19 (0.99–1.42)	1.24 (0.98–1.58)
Outer regional/remote/very remote	1.09 (0.85–1.40)	0.40 (0.16–0.99)	1.15 (0.84–1.58)	1.17 (0.76–1.82)
Area level socio-economic status†	P = 0.46	P = 0.12	P = 0.92	P = 0.13
Quintile 1 (least disadvantaged)	1	1	1	1
Quintile 2	1 (0.81–1.24)	0.57 (0.31–1.04)	1 (0.75–1.34)	1.24 (0.86–1.79)
Quintile 3	1.14 (0.93–1.39)	0.83 (0.48–1.41)	1.05 (0.80–1.38)	1.41 (1.01–1.98)
Quintile 4	1 (0.81–1.24)	0.50 (0.28–0.91)	1.11 (0.84–1.46)	1.02 (0.70–1.50)
Quintile 5 (most disadvantaged)	1 (0.79–1.26)	0.57 (0.29–1.14)	1.03 (0.76–1.39)	1.16 (0.76–1.75)

Yearly household income	P = 0.33	P = 0.07	P = 0.61	P = 0.88
< \$20 000	0.85 (0.68–1.07)	1.61 (0.73–3.52)	0.86 (0.63-1.16)	0.81 (0.55–1.20)
\$20 000–\$39 999	1.01 (0.82–1.24)	2.36 (1.17–4.73)	0.97 (0.74–1.29)	0.86 (0.61–1.23)
\$40 000–\$69 999	1.01 (0.83–1.22)	1.39 (0.66–2.93)	1.06 (0.81–1.38)	0.91 (0.67–1.23)
≥ \$70 000	1	1	1	1
Rather not answer/missing data	0.97 (0.78–1.21)	2.09 (1.01–4.32)	0.95 (0.71–1.28)	0.84 (0.58–1.24)
Health insurance status	<i>P</i> < 0.001	P = 0.94	P < 0.001	P = 0.43
Private insurance	1	1	1	1
No private insurance	1.39 (1.21–1.58)	1.02 (0.65–1.58)	1.61 (1.36–1.91)	1.10 (0.87–1.40)
Current employment status	P = 0.016	P = 0.78	P = 0.001	P = 0.69
Retired	1	1	1	1
Fulltime	0.81 (0.66–1.00)	0.76 (0.35–1.64)	0.63 (0.47–0.84)	1.14 (0.82–1.59)
Other	1.07 (0.93–1.24)	0.96 (0.62-1.47)	1.08 (0.89–1.30)	1.10 (0.85–1.41)

CI = confidence interval; SHR = sub-distribution hazard ratio.

References

- Pink B. An introduction to socio-economic indexes for areas (SEIFA). 2006 (ABS Cat. no. 2039.0). Canberra: Australian Bureau of Statistics; 2008. https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/2039.02006 (viewed Feb 2021).

 Ware JE, Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992; 30: 473-

^{*} The MOS 36-item short-form health survey (SF-36).²

[†] Socio-economic Indexes for Areas (SEIFA), Index of Relative Socioeconomic Disadvantage 2006. 1