

MULTI-VARIATE ANALYSIS

9.1. RELATIVE RISK

The survival analyses shown in Chapter 8 did not account for any differences in patient casemix. Limited casemix information was available within the NYCRIS dataset and it was not, therefore, possible to allow for certain known prognostic factors, such as performance status and stage, within the multivariate analysis of survival presented in this chapter. It is recognised that studies such as this can never fully account for differences in the distribution of unknown casemix factors. Despite this we have adjusted for important factors such as sex, age, socio-economic status and management variation. The results show interesting survival trends which are worthy of discussion. A brief outline of the statistical methodologies employed in this section and how the relative risk tables are interpreted, is given in the appendix (Chapter 10).

Factors	N = 3278		Relative Risk			
	N		Factors Alone	Casemix Adjusted	All Factors Together	
Casemix						
Sex	Male	1546	1.00	1.00	1.00	
	Female	1732	1.03 (0.96 - 1.11)	0.98 (0.91 - 1.05)	0.94 (0.88 - 1.01)	
Age (yrs)	<60	516	1.00	1.00	1.00	
	60-75	1525	1.13 (1.02 - 1.26)	1.13 (1.02 - 1.26)	1.07 (0.96 - 1.19)	
	75+	1237	1.60 (1.43 - 1.78)	1.61 (1.45 - 1.79)	1.27 (1.13 - 1.42)	
Socio-economic Profile	1 - 3	643	1.00	1.00	1.00	
	4 - 7	1868	1.04 (0.95 - 1.14)	1.05 (0.96 - 1.15)	1.05 (0.96 - 1.15)	
	8 - 10	767	1.13 (1.02 - 1.26)	1.17 (1.05 - 1.30)	1.12 (1.00 - 1.24)	
Period	1986-88	1094	1.00	1.00	1.00	
	1989-91	1109	0.98 (0.90 - 1.07)	0.97 (0.90 - 1.06)	0.96 (0.88 - 1.05)	
	1992-94	1075	0.96 (0.88 - 1.05)	0.96 (0.88 - 1.05)	0.91 (0.83 - 0.99)	
Hospital Factors						
Treatment	Resection	130	0.29 (0.24-0.35)	0.33 (0.27 - 0.40)	0.37 (0.31 - 0.46)	
	Non-resection	1054	0.50 (0.46-0.54)	0.51 (0.47 - 0.55)	0.57 (0.53 - 0.63)	
	Stent	259	0.61 (0.54-0.70)	0.62 (0.55 - 0.71)	0.66 (0.58 - 0.76)	
	Other	57	0.52 (0.40-0.67)	0.59 (0.45 - 0.77)	0.60 (0.46 - 0.78)	
	None	1778	1.00	1.00	1.00	
Workload Factors						
Hospital Workload	0-12	721	1.00	1.00	1.00	
	13-16	1072	0.94 (0.86 - 1.04)	0.98 (0.89 - 1.08)	1.07 (0.97 - 1.18)	
	17-24	694	0.87 (0.79 - 0.97)	0.93 (0.84 - 1.04)	1.04 (0.93 - 1.16)	
	=25	791	0.82 (0.74 - 0.91)	0.87 (0.78 - 0.96)	0.97 (0.87 - 1.08)	
Consultant Workload	=1	745	1.00	1.00	1.00	
	>1=3	982	0.72 (0.66 - 0.79)	0.74 (0.67 - 0.81)	0.87 (0.79 - 0.97)	
	>3=5	733	0.56 (0.51 - 0.62)	0.59 (0.53 - 0.65)	0.79 (0.69 - 0.90)	
	>5	802	0.52 (0.47 - 0.57)	0.55 (0.50 - 0.61)	0.74 (0.66 - 0.84)	
Specialty	Surgeon	2190	1.00	1.00	1.00	
	Physician	565	1.66 (1.51 - 1.83)	1.66 (1.51 - 1.82)	1.14 (1.02 - 1.28)	
	Medicine for the Elderly	435	2.25 (2.02 - 2.49)	1.97 (1.76 - 2.21)	1.24 (1.08 - 1.43)	
	Other	72	1.43 (1.13 - 1.79)	1.39 (1.10 - 1.74)	0.88 (0.69 - 1.12)	

Univariate analyses (shown in the first results column, headed "Factors Alone") shows that, whereas neither sex or time period influenced survival, there was a significant effect of socio-economic profile and age, with an improved outcome in the more affluent groups and the under 60's. Not surprisingly, survival was also significantly improved among the resected patients (in comparison with other treated groups or with untreated patients) and among patients treated by surgeons (in comparison with those managed by physicians or other specialties). There were also significant workload effects with a benefit among patients managed by high volume consultants & in high volume hospitals.

Adjustment of these analyses for the four "casemix" variables (sex, age, socio-economic profile and time period) did not substantively modify any of the above findings (shown in second results column, headed "Casemix Adjusted") although there was now a significant adverse effect on survival for patients from less affluent backgrounds. Mutual