

Appendix B

Figures

Figure 1.1: Comparisons to be Used

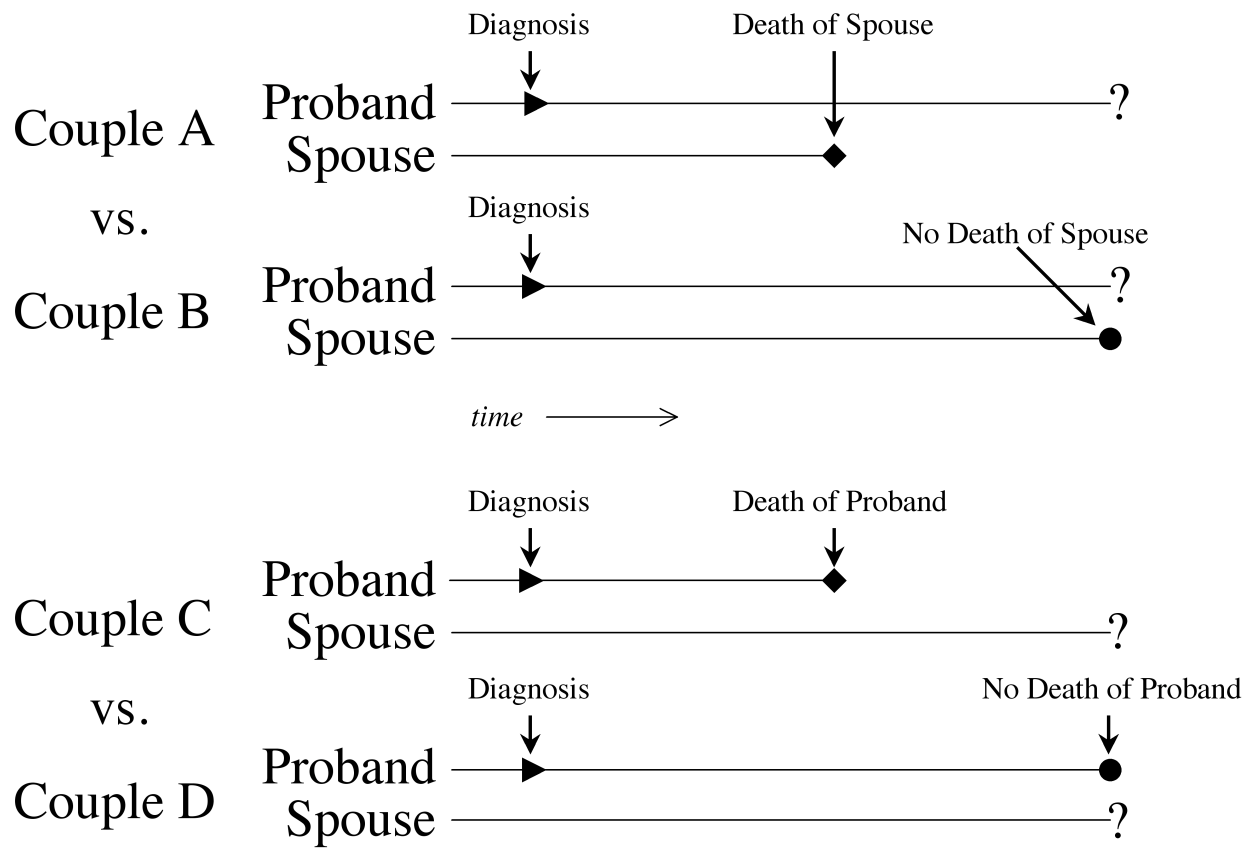


Figure 1.2: Time Courses of Spousal Social Capital vs. Caregiver Burden

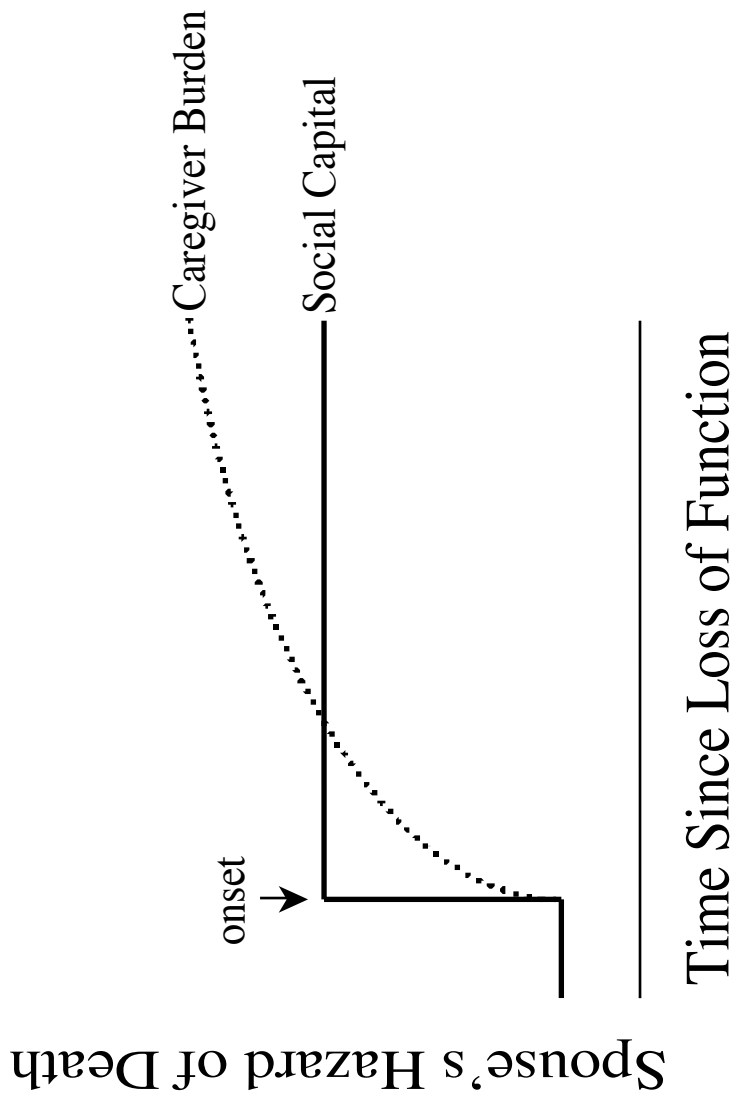


Figure 2.1: Marital Status in COSI

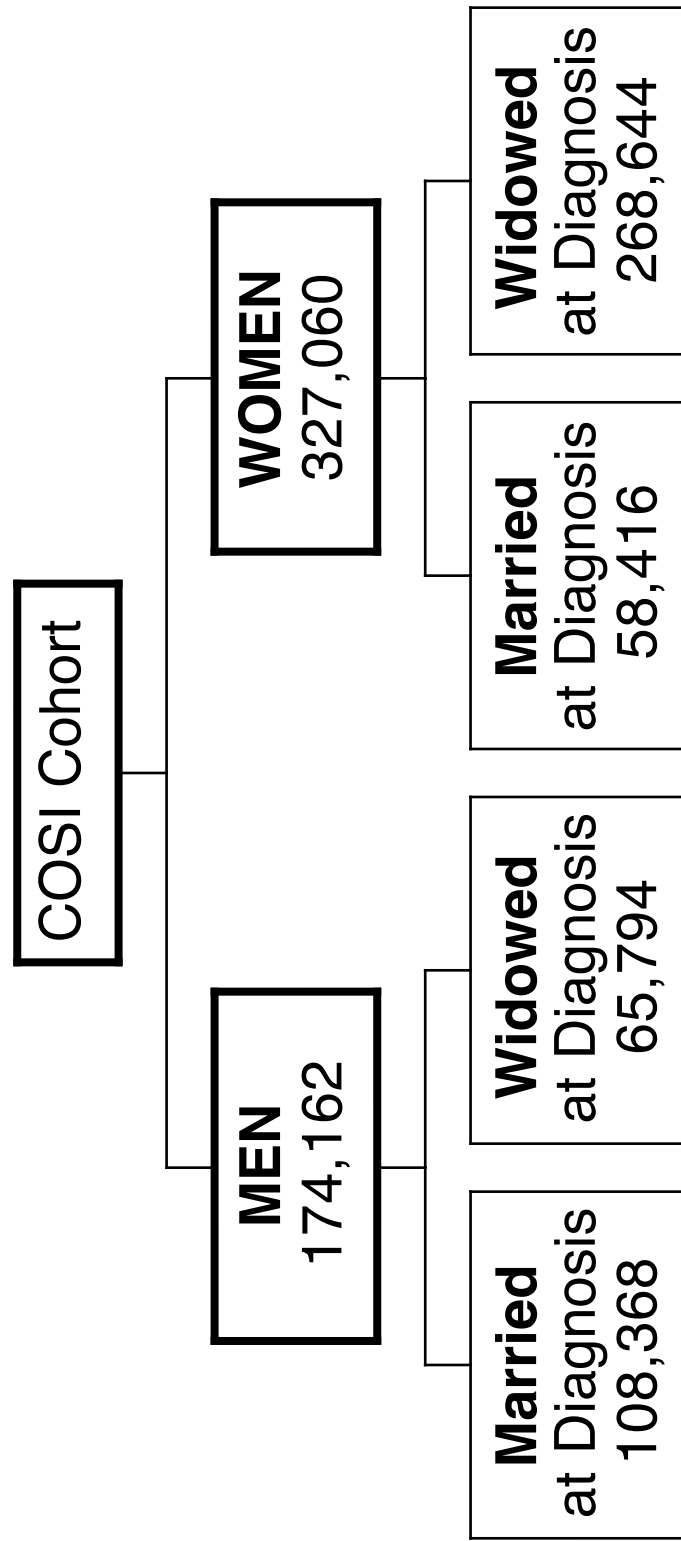


Figure 2.2: Survival Following Diagnosis

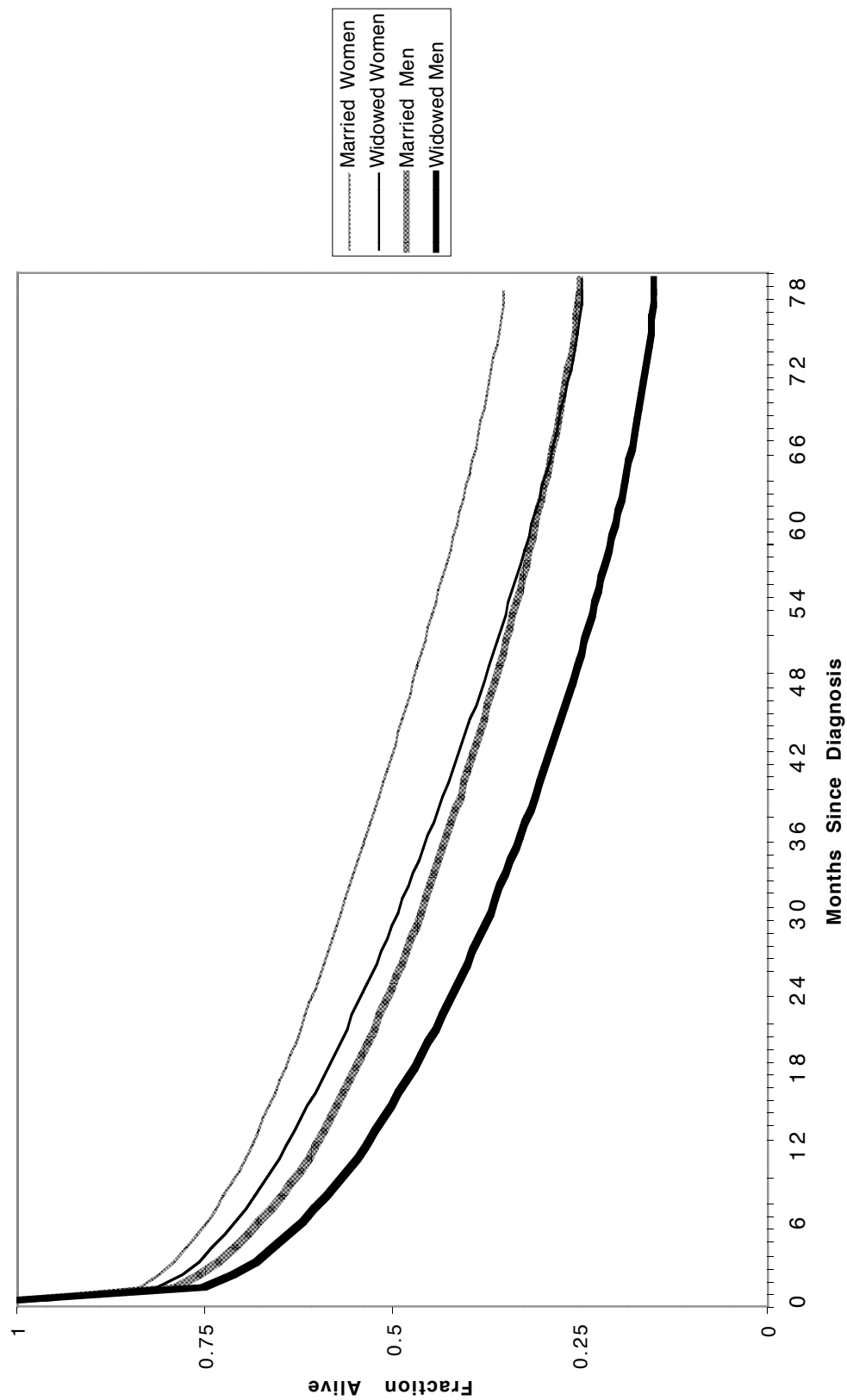


Figure 2.3a: Survival Following Diagnosis - Men

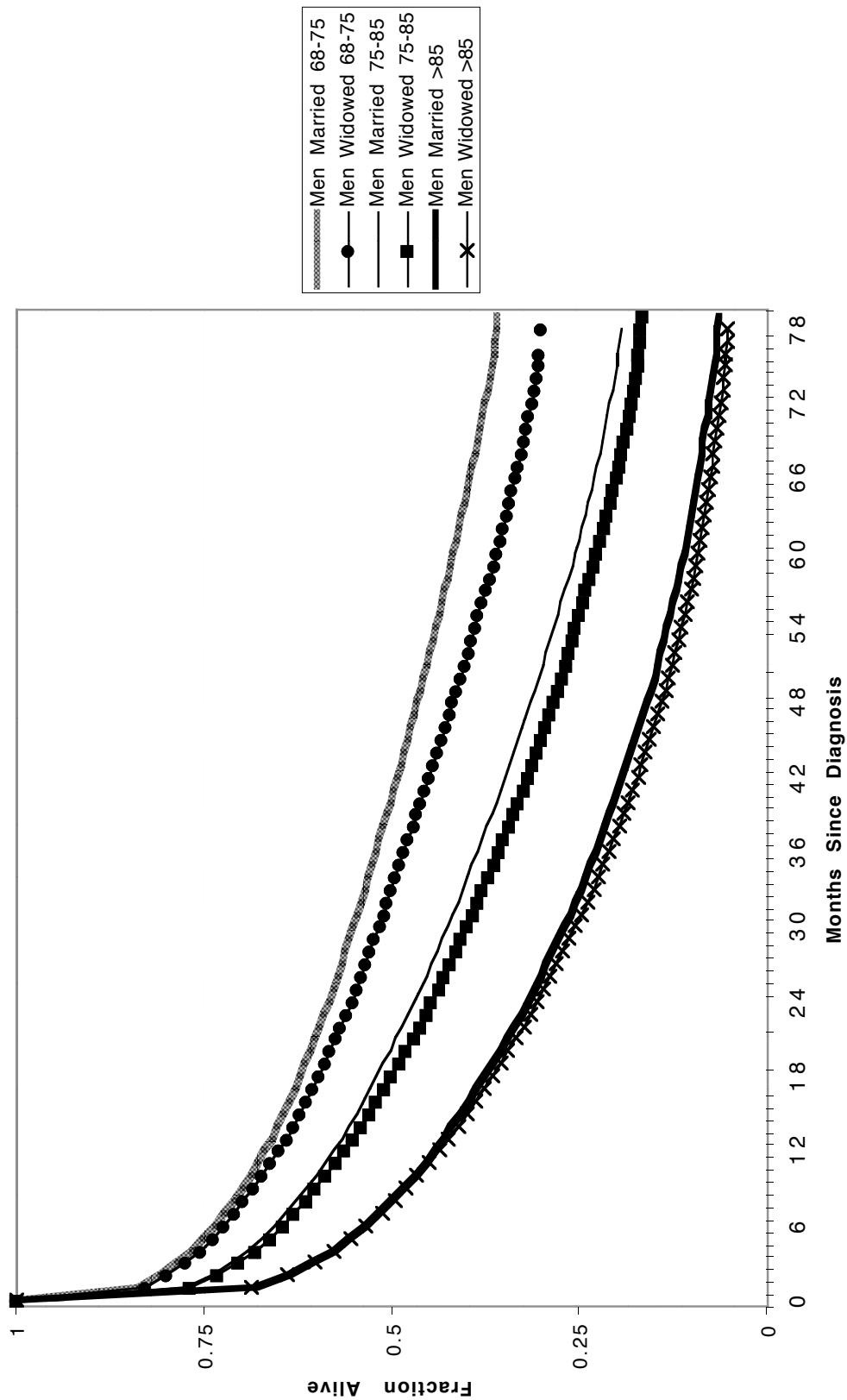


Figure 2.3b: Survival Following Diagnosis - Women

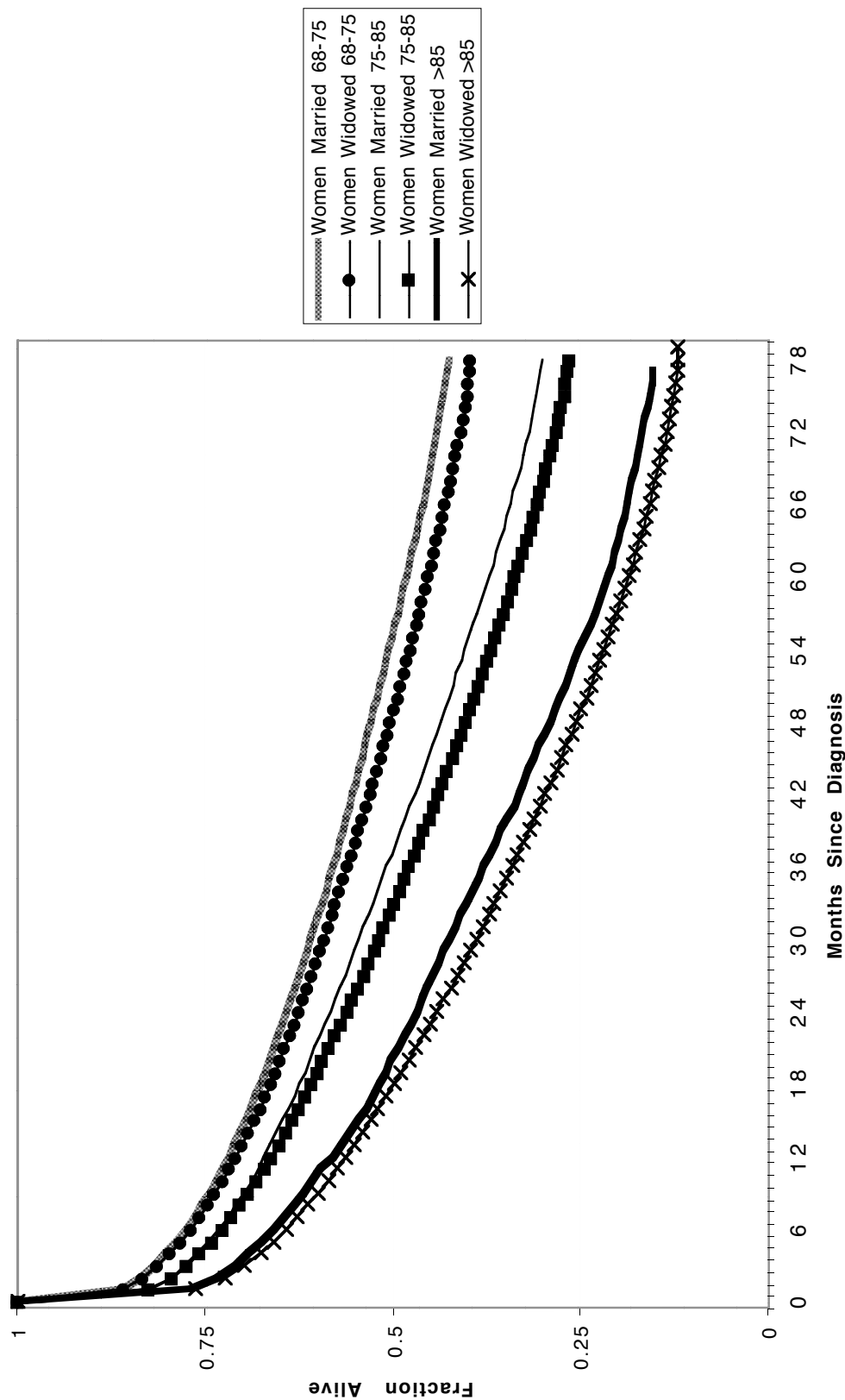


Figure 2.4a: Effects of Spousal Loss - Men

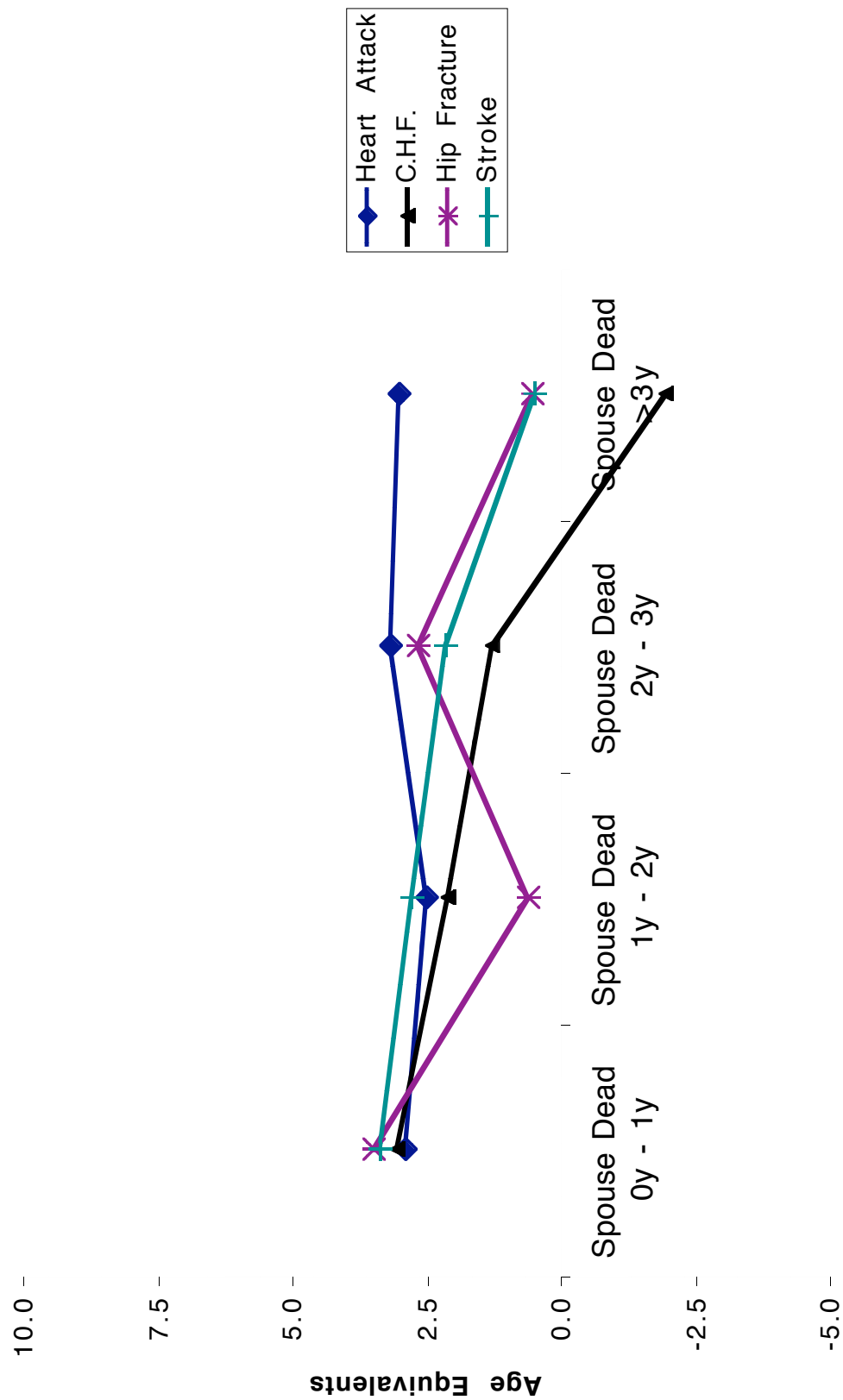


Figure 2.4b: Effects of Spousal Loss - Men

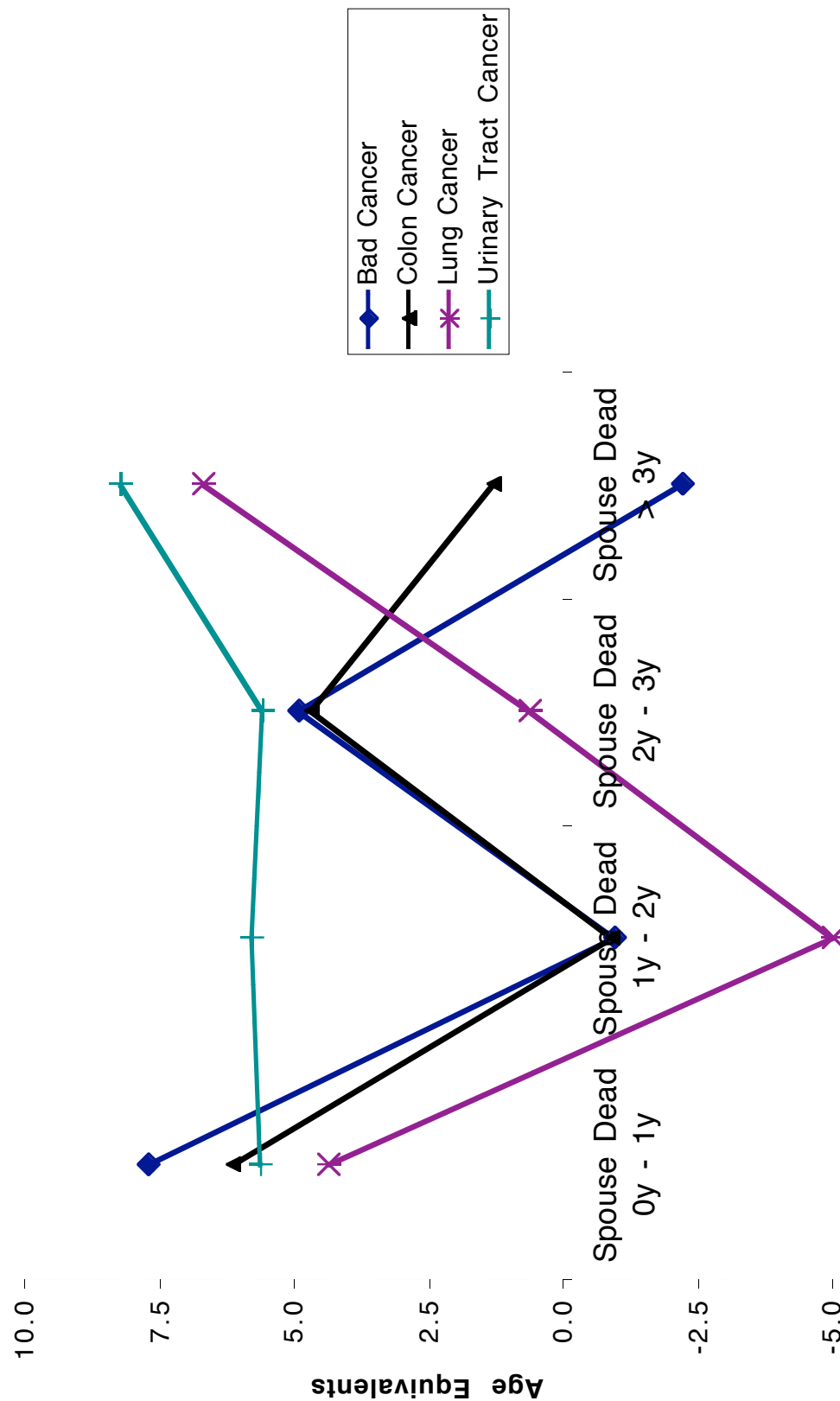


Figure 2.5a: Effects of Spousal Loss - Women

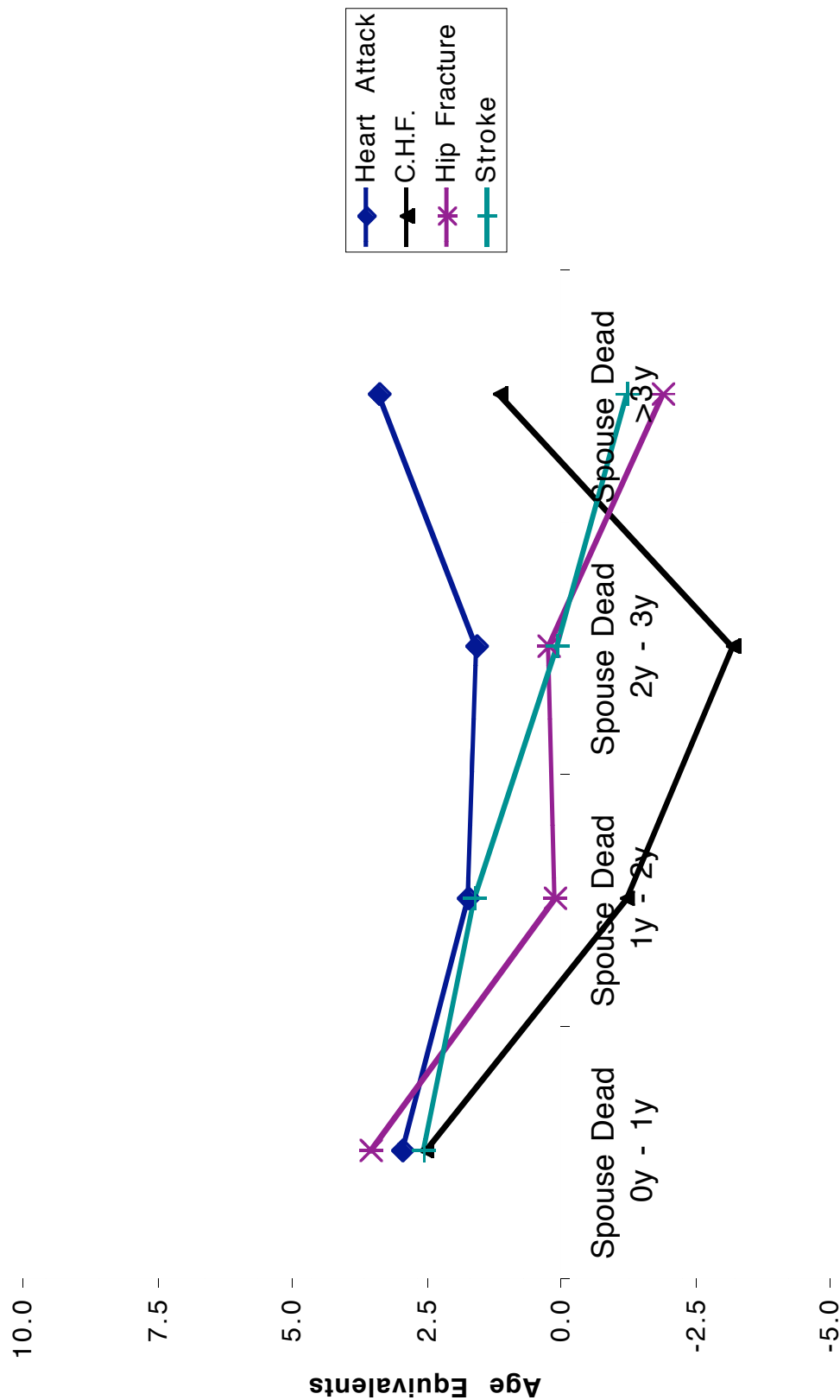


Figure 2.5b: Effects of Spousal Loss - Women

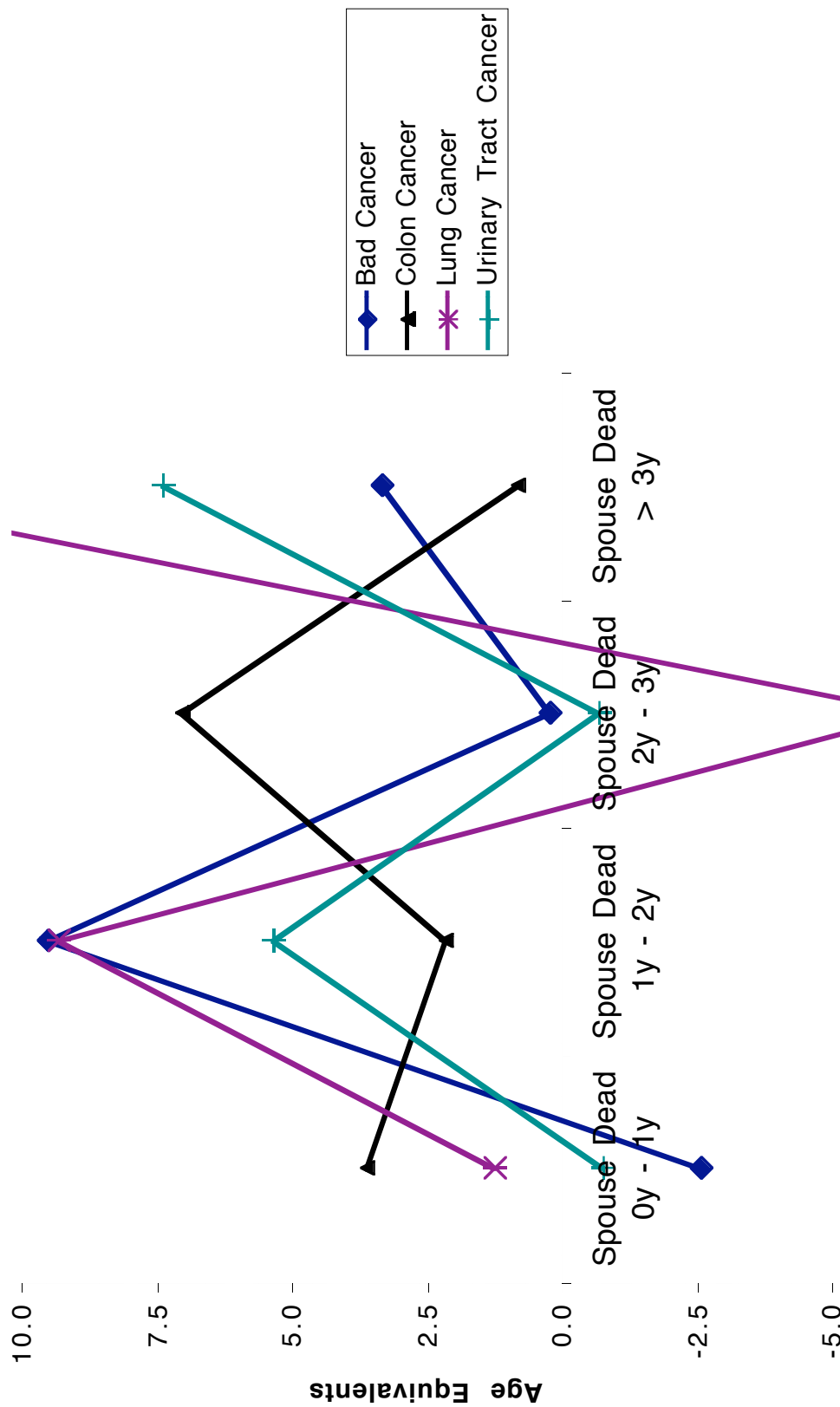


Figure 2.6a: Effects of Proband Loss - Men

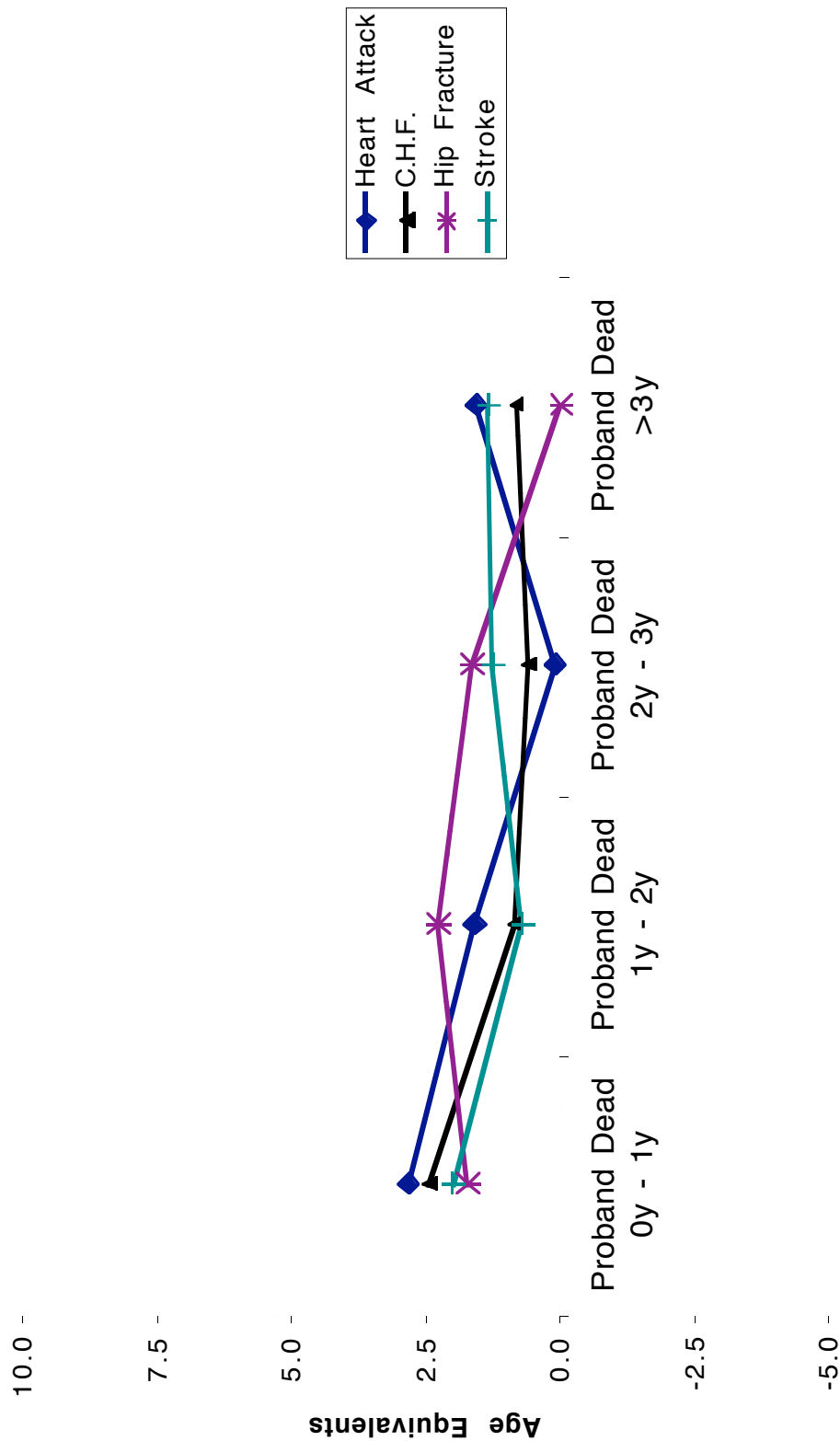


Figure 2.6b: Effects of Proband Loss - Men

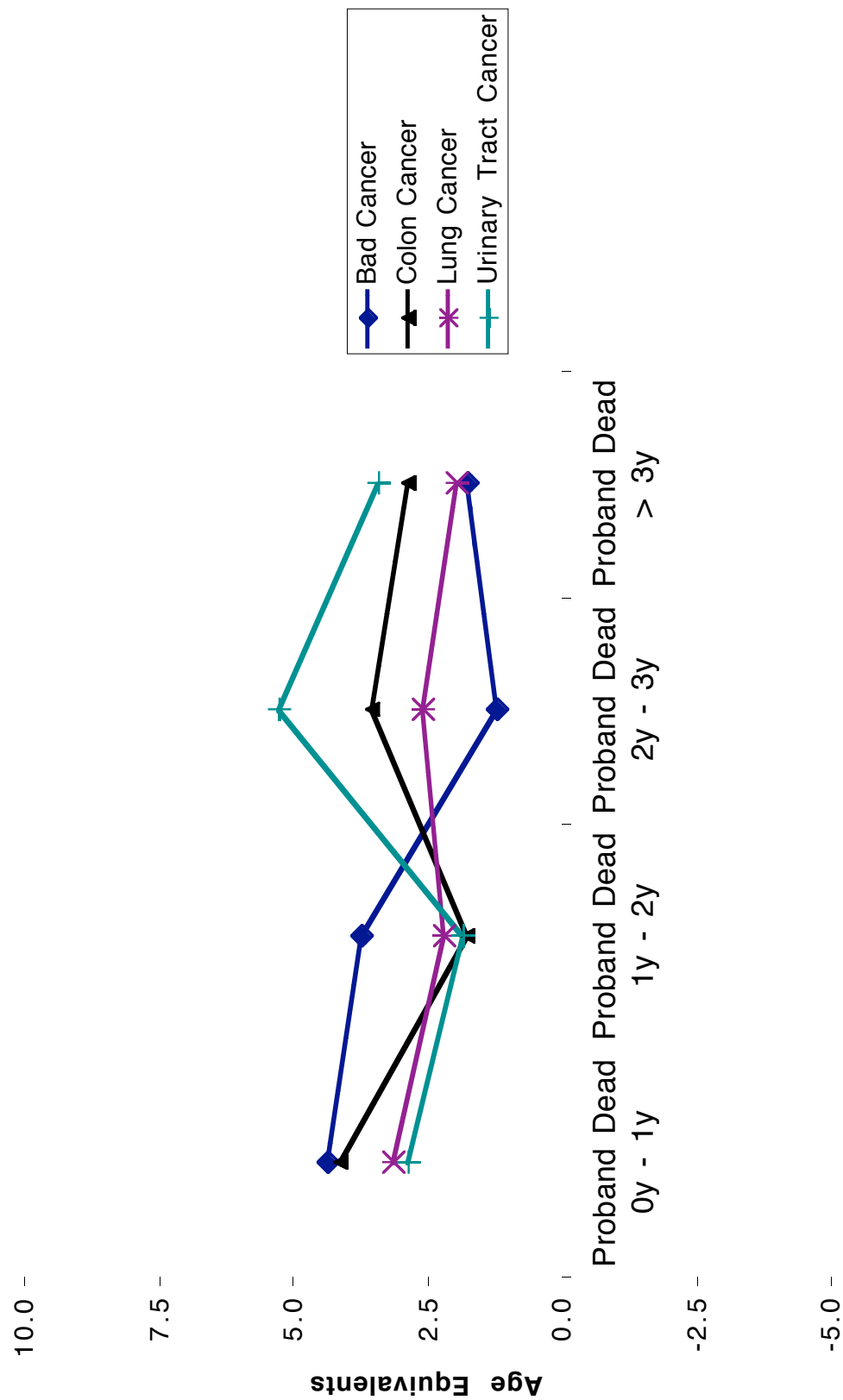


Figure 2.7a: Effects of Proband Loss - Women

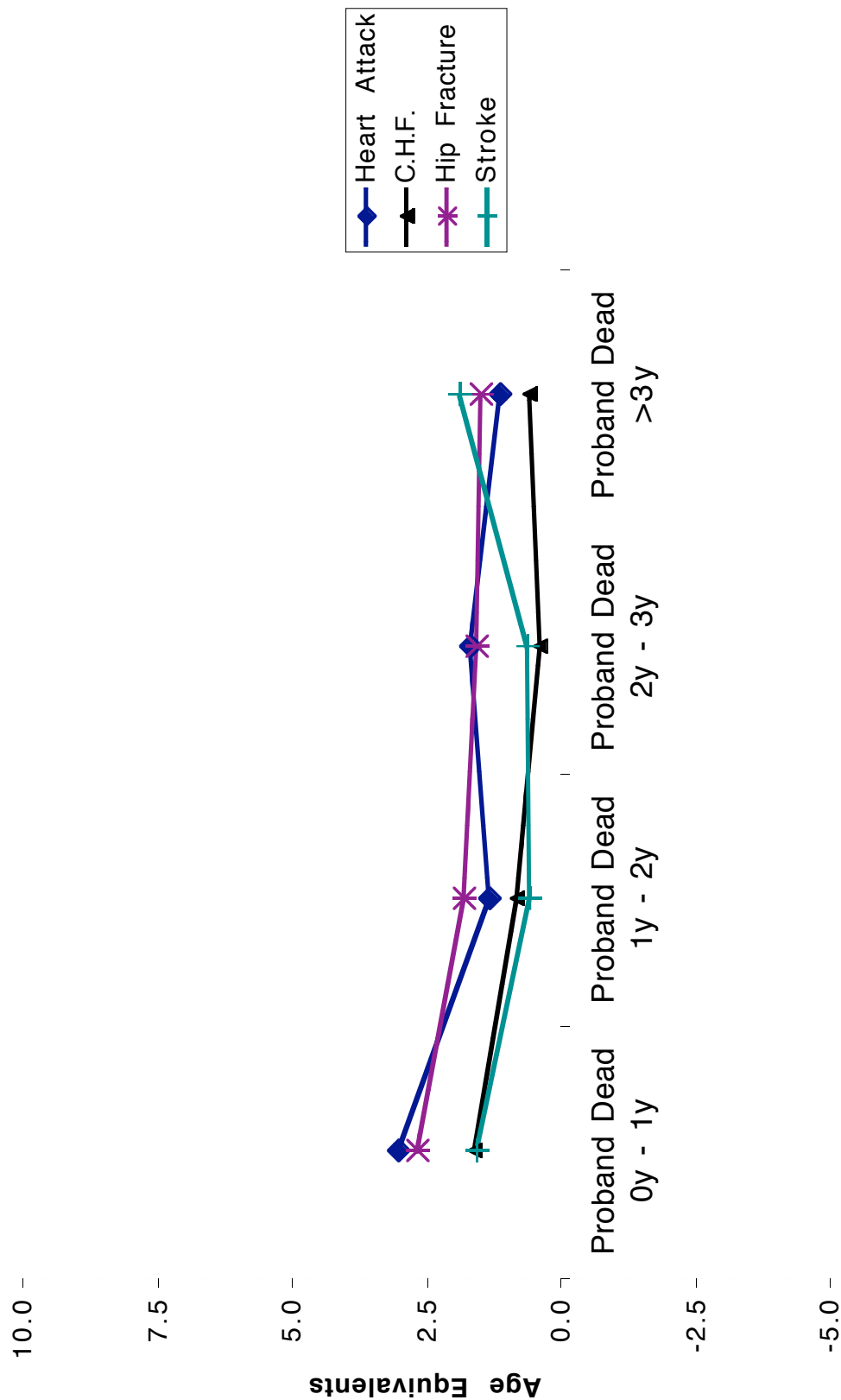


Figure 2.7b: Effects of Proband Loss - Women

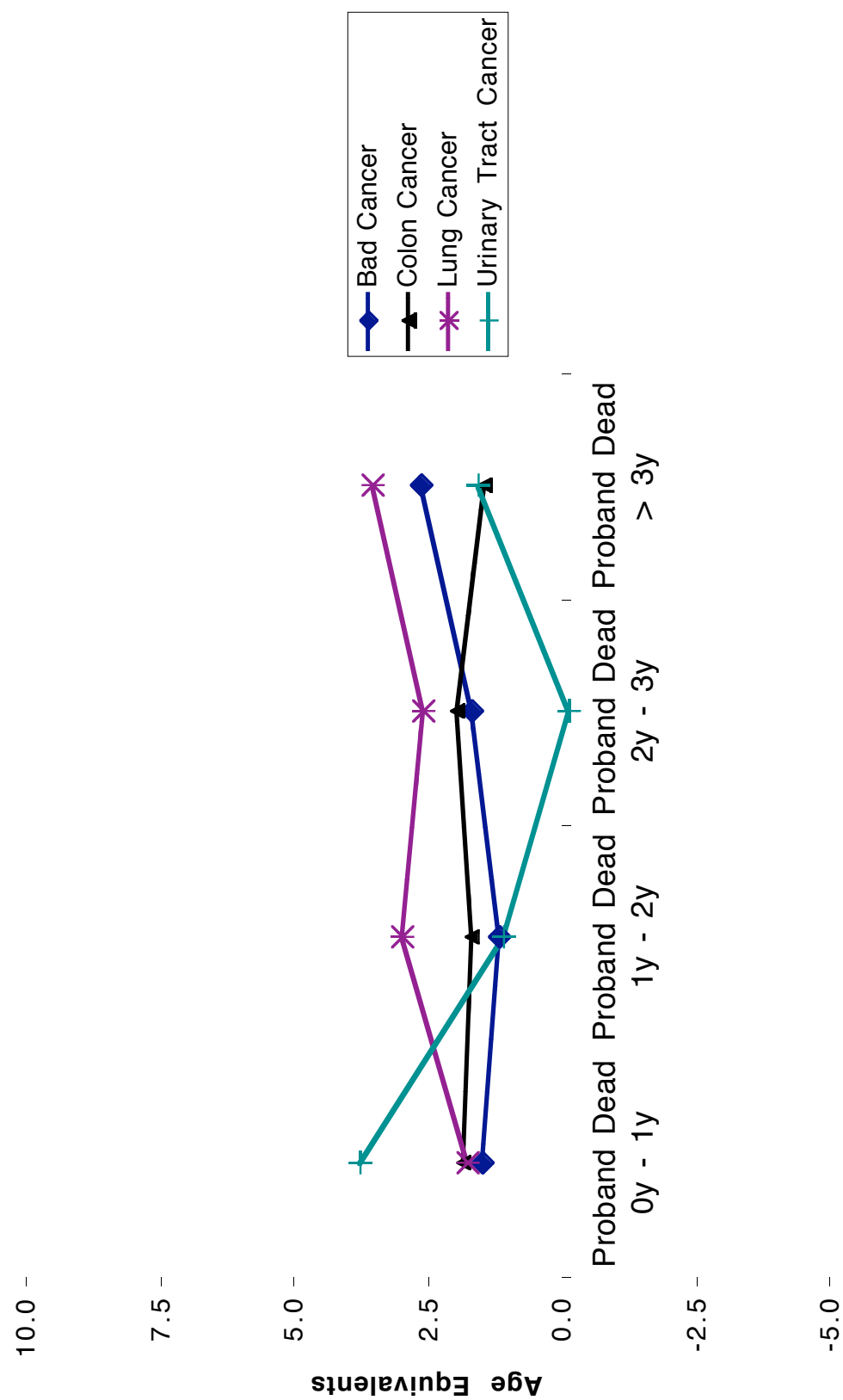
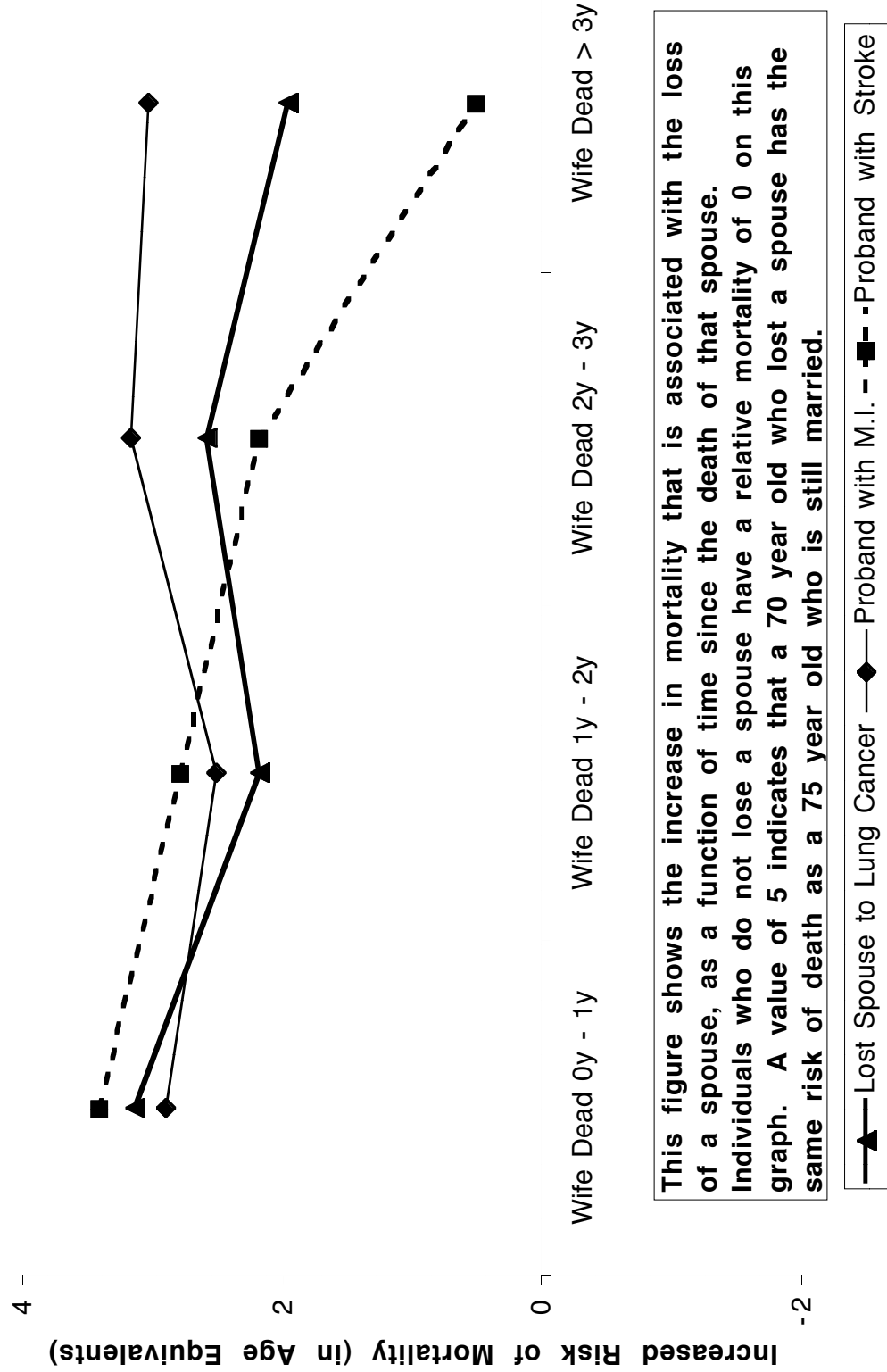
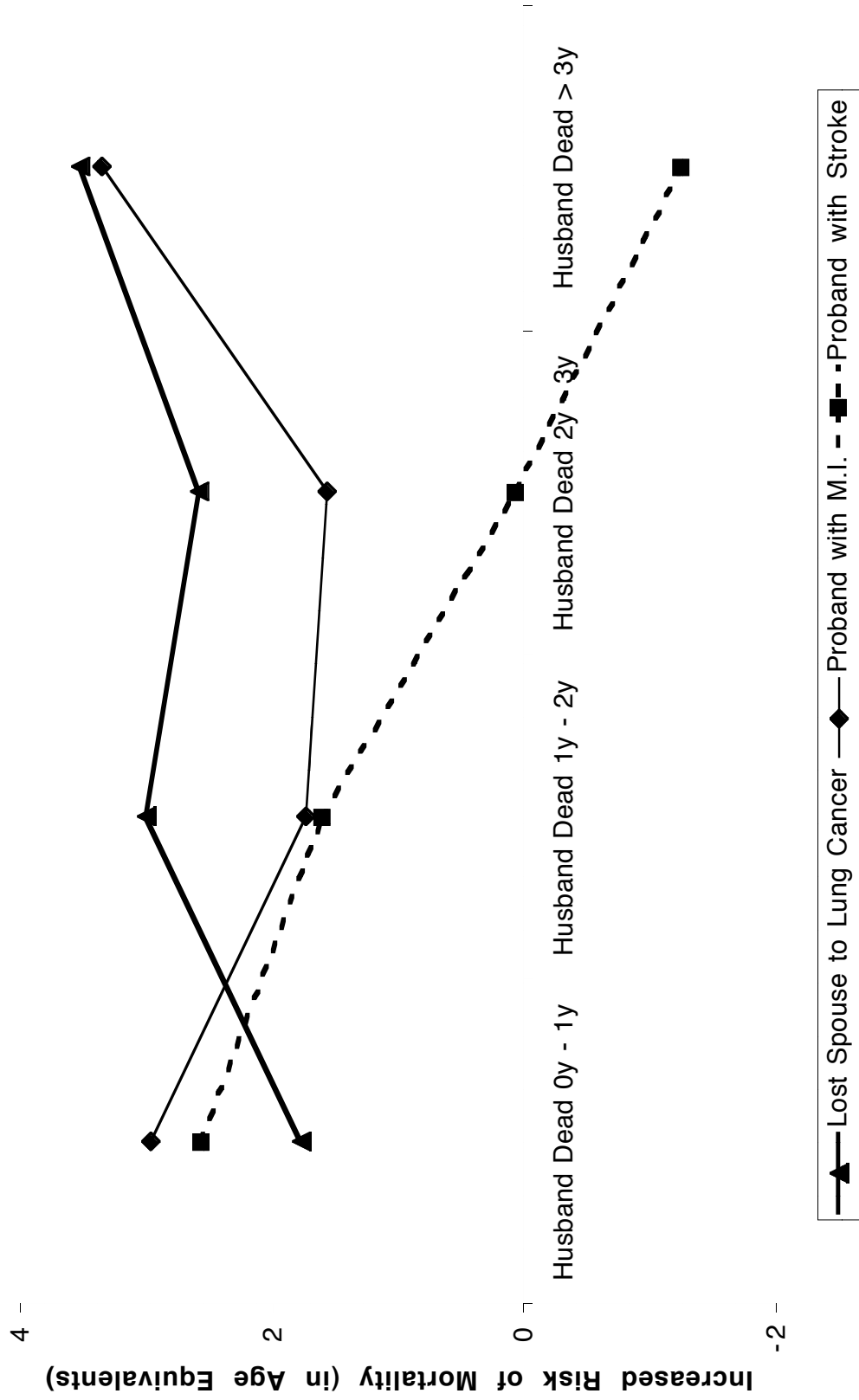


Figure 5.1 - Effects of Losing a Spouse - Men



This figure shows the increase in mortality that is associated with the loss of a spouse, as a function of time since the death of that spouse. Individuals who do not lose a spouse have a relative mortality of 0 on this graph. A value of 5 indicates that a 70 year old who lost a spouse has the same risk of death as a 75 year old who is still married.

Figure 5.2 - Effects of Losing a Spouse - Women



—▲— Lost Spouse to Lung Cancer —◆— Proband with M.I. - -■- - Proband with Stroke

Fig. 5.3: Relationship of Investment, Stock, Flow and Mortality

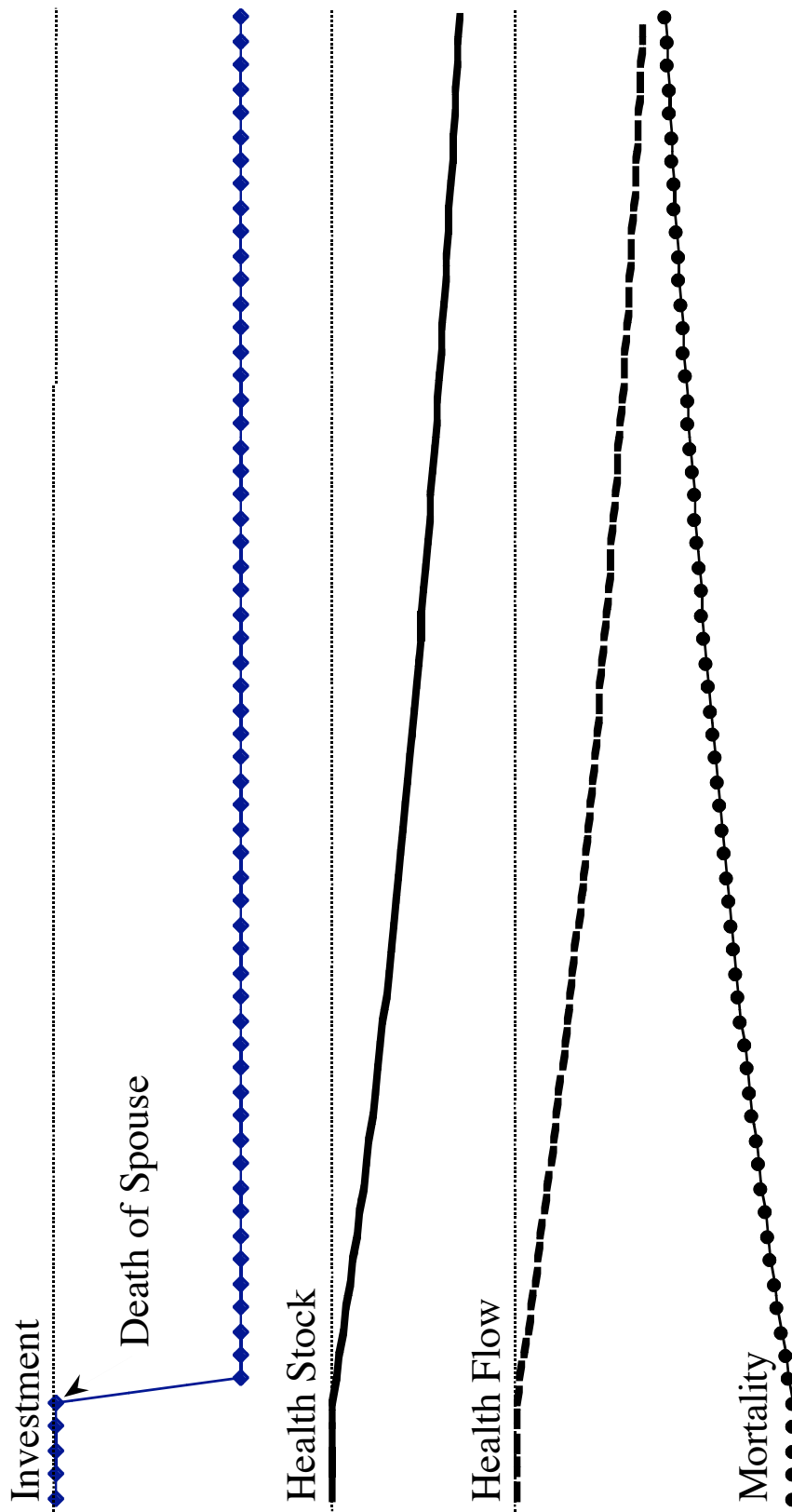
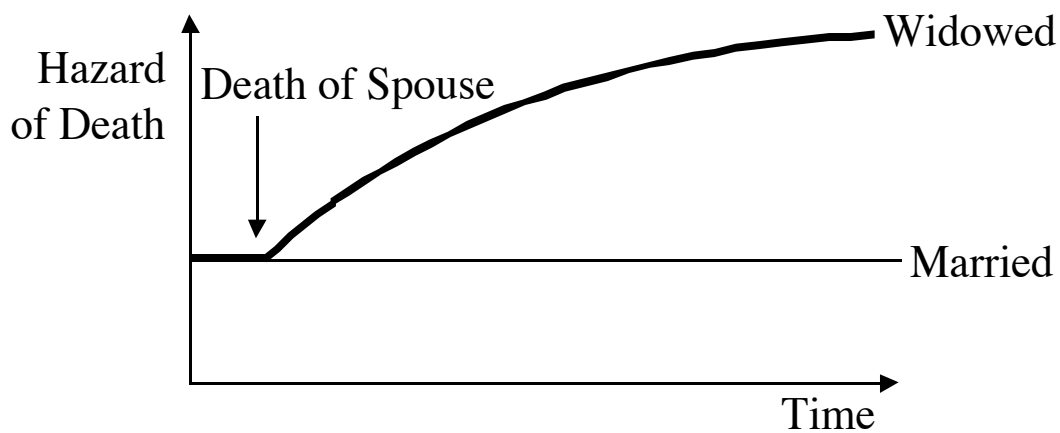
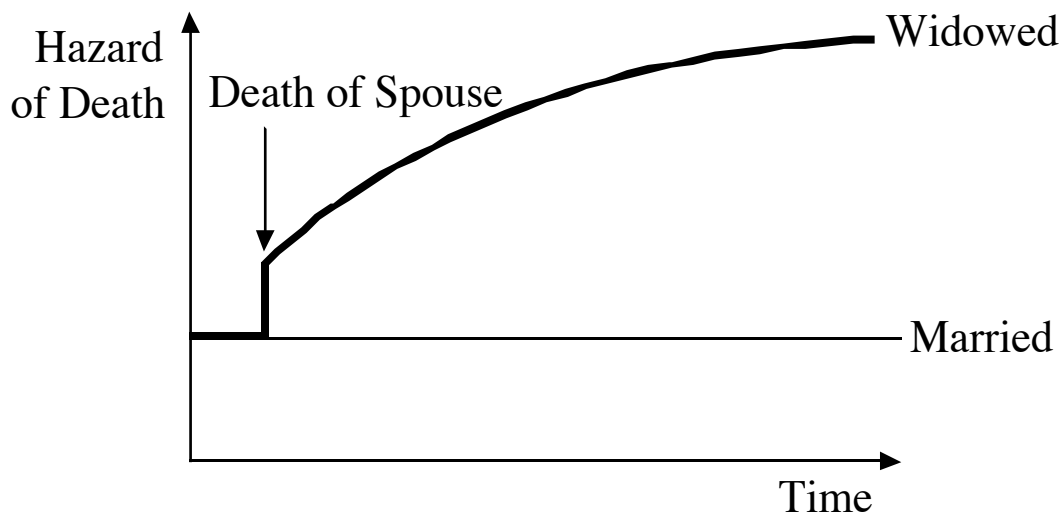


Fig. 5.4: Patterns of Death from Investment Models

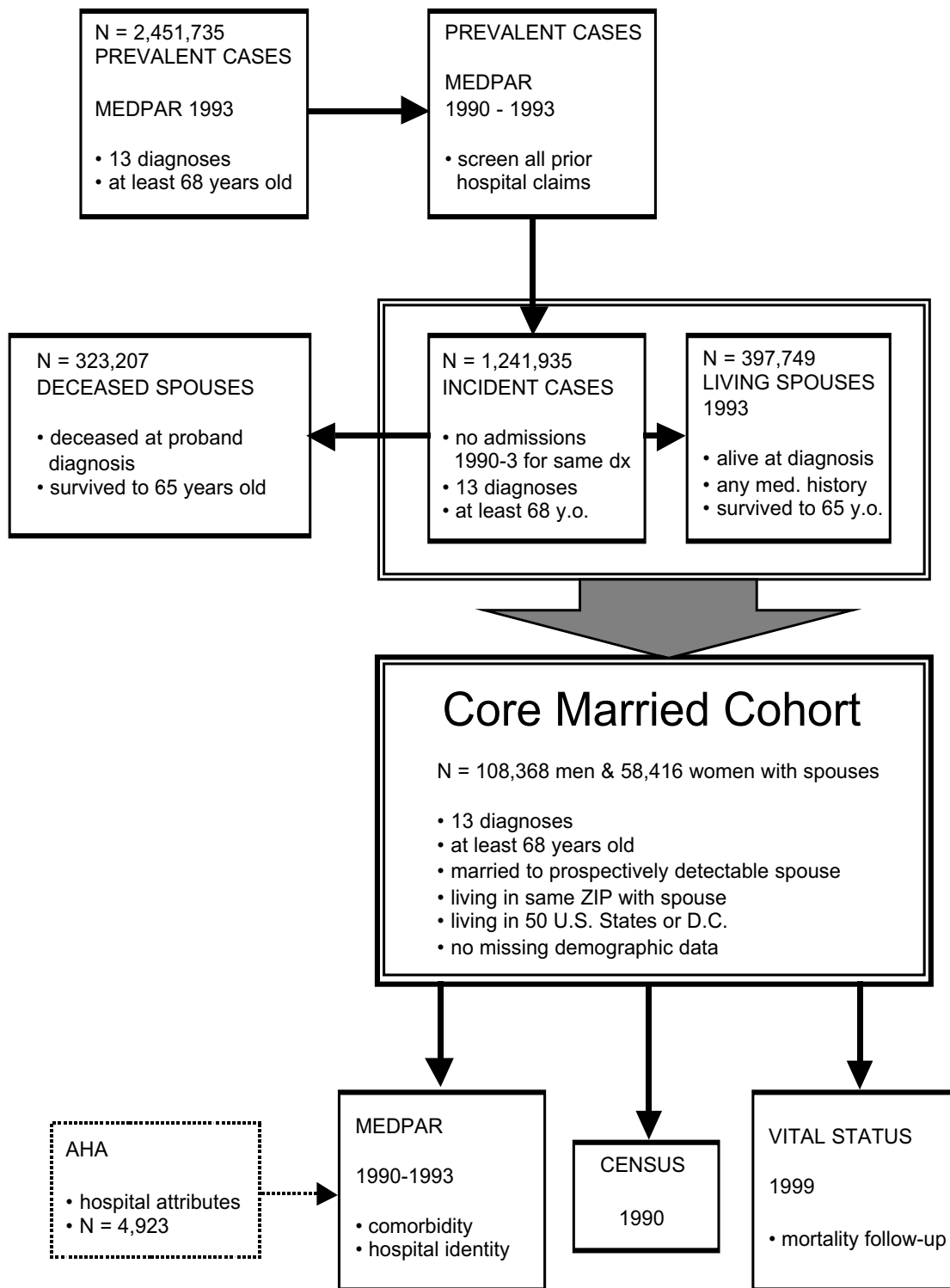


Basic Investment Model
with Decreased Inputs at Death of Spouse



Decreased Inputs + Shock Model

Figure A.1: Overview of Data Construction



Appendix C Tables

Table 1.1: How Might Marriage Work?

	Current Period	“Now”	Investment	“Forever”
Direct – Physiological “Change your body”	<ul style="list-style-type: none"> • Neuroendocrine effects • Immunological effects 		<ul style="list-style-type: none"> • Unmeasured 	
Emotional “Change your mind”	<ul style="list-style-type: none"> • Buffering of stress 		<ul style="list-style-type: none"> • Learning of buffering skills • Stronger mental health base 	
Instrumental “Change your world”	<ul style="list-style-type: none"> • Umberson social control • Instrumental social support • Inter-Spousal social capital 		<ul style="list-style-type: none"> • Umberson social control • Grossman health capital • Lillard & Waite income benefits 	

Table 1.2: Summary of Hypotheses

Theory	Focus	Disease Ranking
Current Period Models		
A Direct Physiology	Proband	Cancer > CHF, stroke, hip > MI
B1 Emotional – Stress Buffering	Proband	CHF, stroke, hip > MI
B2 Emotional – Perceived Support	Proband	Non-Alz. > Alz. CHF > MI, Cancer
C Social Control (Umberson)	Proband	Time Course: up, and increasing thereafter
Social Support – Informal Groups (Litwak)	Proband	Stroke, hip > colon, lung > MI, CHF > CNS, pancreatic cancer
Social Support – Day to Day Care	Proband	CHF, hip, stroke > MI
Social Support – Information Provision	Proband	MI > others Non-Alz. Spouse > Alz. Spouse
D4 Kin-Keeping	Proband	Time Course: tapering as adaptation occurs
E1 Social Capital – Physical	Spouse	MI, Cancer > CHF, hip, stroke in Proband Time Course: unrelated to time proband sick
E2 Social Capital – Intellectual	Spouse	Non-Alz > Alz. in Proband Time Course: unrelated to time proband sick

Table 1.2: Summary of Hypotheses (continued)

Theory	Focus	Disease Ranking
Investment Models		
F1 Pure Investment	Proband	Time Course: gradual increase of relative hazard
F2 Investment + Shocks	Proband	Time Course: up, and increasing thereafter
F3 Investment + Shocks + Reinvestment	Proband	Time Course: Bereavement: Bad Ca, Lung Ca > CHF, Stroke > MI, Colon Ca
G Lillard & Waite Assets	Spouse	For women: CHF > Colon Ca, Lung Ca in probands
Alternative Hypotheses		
H Caregiving Fatigue Selection:	Spouse	within CHF, hip, stroke, the Hazard Ratio of loss decreases with time since diagnosis.
S1 Positive Assortative Mating	Either	Impact of marital status loss decreases with age
S2 Selection: Joint Health Shocks	Both	Increased likelihood of both being in COSI
S3 Selection: Joint Health Shocks	Either	Impact of loss less if spouse lost to cardiac arrest MI, CHF, lung > Colon, hip > CNS Ca.,
S4 Selection: Joint Poor Health Behavior	Proband	Lymphoma/Leukemia

Table 2.1: Characteristics of Full COSI Cohort

	<u>Men</u>	<u>Women</u>
N=	174,162	327,060
Age	78.9	80.6
Married	62.2%	17.9%
Race		
White	88.8%	89.7%
Black	5.2%	6.0%
Hispanic	0.5%	0.3%
Asian	2.3%	1.7%
Other	3.2%	2.2%
Medicaid Beneficiary	8.4%	16.7%
Median Income (\$1000)	29.8	30.1
Primary Diagnosis		
M.I.	21.1%	15.5%
C.H.F.	20.5%	21.6%
Stroke	19.5%	20.8%
Hip Fracture	10.0%	23.7%
Any Cancer	28.9%	18.3%
Lung	8.6%	4.3%
Colon	6.9%	5.9%
Urinary Tract	5.1%	1.7%
Bad Cancers	8.3%	6.4%
Liver & Biliary Tract	0.7%	0.6%
C.N.S.	0.5%	0.4%
Head & Neck	1.1%	0.5%
Lymphoma	2.8%	2.4%
Leukemia	2.1%	1.4%
Pancreatic	1.2%	1.2%
Charlson Score (1st Yr. Mean)	0.60	0.51
Hospitalizations (1st Yr. Mean)	0.52	0.53
Charlson Score (2nd Yr. Mean)	0.42	0.37
Hospitalizations (2nd Yr. Mean)	0.40	0.40
Charlson Score (3rd Yr. Mean)	0.33	0.29
Hospitalizations (3rd Yr. Mean)	0.35	0.35
Survival, Mean (Days)	947.8	1087.8
% Dying by 6/30/99	76.7%	71.8%

Table 2.2: Cox Models for Mortality of Full COSI Cohort

	Men		Women	
	<u>Hazard Ratio</u>	<u>p-value</u>	<u>Hazard Ratio</u>	<u>p-value</u>
Age (1 yr.)	1.054	<.0001	1.056	<.0001
Spouse Dead at Dx	1.019	0.0029	1.004	0.4524
Age Equivalents				
Spouse Dead at Dx	0.358		0.073	
Race (vs. White)				
Black	1.037	0.0033	0.983	0.0527
Hispanic	0.945	0.0027	0.961	0.0152
Asian	0.930	0.0600	0.945	0.1317
Other	1.557	<.0001	1.384	<.0001
Medicaid Recipient	1.145	<.0001	1.129	<.0001
ZIP Median Income (\$1000)	0.998	<.0001	1.001	0.0005
Primary Diagnosis				
M.I.	0.299	<.0001	0.341	<.0001
C.H.F.	0.401	<.0001	0.362	<.0001
Stroke	0.335	<.0001	0.341	<.0001
Hip Fracture	0.320	<.0001	0.244	<.0001
Cancers:				
Lung	1.000	(ref.)	1.000	(ref.)
Colon	0.332	<.0001	0.335	<.0001
Liver	1.089	0.0038	1.102	<.0001
C.N.S.	1.133	0.0005	1.081	0.0116
Head & Neck	0.449	<.0001	0.468	<.0001
Pancreas	1.287	<.0001	1.289	<.0001
Lymphoma	0.594	<.0001	0.598	<.0001
Leukemia	0.600	<.0001	0.570	<.0001
Urinary Tract	0.302	<.0001	0.346	<.0001
Comorbidity Measures				
1st Year Before Admission				
No Hospitalizations	1.047	<.0001	1.010	0.1784
Charlson = 0	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.255	<.0001	1.256	<.0001
Charlson = 2	1.466	<.0001	1.453	<.0001
Charlson = 3	1.564	<.0001	1.581	<.0001
Charlson = 4	1.724	<.0001	1.755	<.0001
Charlson = 5	1.811	<.0001	1.874	<.0001
Charlson = 6	2.315	<.0001	2.316	<.0001
Charlson > 6	2.409	<.0001	2.384	<.0001

Table 2.2: Cox Models for Mortality of Full COSI Cohort (cont)

	Men		Women	
	<u>Hazard Ratio</u>	<u>p-value</u>	<u>Hazard Ratio</u>	<u>p-value</u>
2nd Year Before Admission				
No Hospitalizations	1.074	<.0001	1.044	<.0001
Charlson = 0	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.222	<.0001	1.205	<.0001
Charlson = 2	1.308	<.0001	1.305	<.0001
Charlson = 3	1.388	<.0001	1.391	<.0001
Charlson = 4	1.451	<.0001	1.496	<.0001
Charlson = 5	1.478	<.0001	1.550	<.0001
Charlson = 6	1.622	<.0001	1.797	<.0001
Charlson > 6	1.655	<.0001	1.574	<.0001
3rd Year Before Admission				
No Hospitalizations	1.079	<.0001	1.032	<.0001
Charlson = 0	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.208	<.0001	1.181	<.0001
Charlson = 2	1.284	<.0001	1.280	<.0001
Charlson = 3	1.442	<.0001	1.376	<.0001
Charlson = 4	1.456	<.0001	1.455	<.0001
Charlson = 5	1.481	<.0001	1.548	<.0001
Charlson = 6	1.427	<.0001	1.478	<.0001
Charlson > 6	1.456	<.0001	1.574	<.0001
N	174,162		327,060	
Events	133,656		234,766	
Censored	40,506		92,294	

Table 2.3: Impact of Marital Status at Diagnosis on Survival of Men

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.072	<.0001	1.052	<.0001	1.056	<.0001	1.066	<.0001
Spouse Dead at Dx	0.982	0.2287	1.008	0.5154	0.970	0.0889	1.002	0.9068
Age Equivalents								
Spouse Dead at Dx	-0.261		0.157		-0.559		0.031	
Race (vs. White)								
Black	0.995	0.8822	0.952	0.0655	0.932	0.144	1.059	0.0192
Hispanic	0.924	0.0781	0.898	0.0063	0.850	0.0088	0.929	0.0629
Asian	1.027	0.7862	0.910	0.2403	0.919	0.5607	0.782	0.004
Other	1.765	<.0001	1.426	<.0001	1.316	<.0001	1.491	<.0001
Medicaid Recipient	1.203	<.0001	1.097	<.0001	1.148	<.0001	1.168	<.0001
ZIP Median Income (\$1000)	0.997	<.0001	1.000	0.4856	0.999	0.0608	0.998	0.0007
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations								
Charlson = 0	1.103	0.0009	1.068	0.0034	1.000	0.9923	1.044	0.1118
Charlson = 1	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 2	1.422	<.0001	1.186	<.0001	1.372	<.0001	1.287	<.0001
Charlson = 3	1.744	<.0001	1.369	<.0001	1.534	<.0001	1.518	<.0001
Charlson = 4	1.948	<.0001	1.514	<.0001	1.585	<.0001	1.554	<.0001
Charlson = 5	2.188	<.0001	1.558	<.0001	1.669	<.0001	1.860	<.0001
Charlson = 6	2.203	<.0001	1.693	<.0001	1.602	<.0001	1.828	<.0001
Charlson > 6	2.847	<.0001	2.676	<.0001	1.852	<.0001	2.268	<.0001
	2.913	<.0001	2.919	<.0001	2.259	<.0001	2.716	<.0001

Table 2.3: Impact of Marital Status at Diagnosis on Survival of Men (Page 2 of 4)

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.097	0.0011	1.112	<.0001	1.074	0.027	1.041	0.1238
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.294	<.0001	1.201	<.0001	1.263	<.0001	1.226	<.0001
Charlson = 2	1.432	<.0001	1.289	<.0001	1.325	<.0001	1.297	<.0001
Charlson = 3	1.522	<.0001	1.425	<.0001	1.379	<.0001	1.370	<.0001
Charlson = 4	1.589	<.0001	1.439	<.0001	1.457	<.0001	1.459	<.0001
Charlson = 5	1.545	<.0001	1.388	0.0005	1.284	0.0293	1.629	<.0001
Charlson = 6	1.559	<.0001	1.590	<.0001	1.838	<.0001	1.647	<.0001
Charlson > 6	1.560	<.0001	2.296	<.0001	1.467	0.0008	2.071	<.0001
3rd Year Before Admission								
No Hospitalizations	1.062	0.0318	1.086	0.0003	1.051	0.118	1.103	0.0001
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.245	<.0001	1.166	<.0001	1.226	<.0001	1.250	<.0001
Charlson = 2	1.433	<.0001	1.231	<.0001	1.245	<.0001	1.409	<.0001
Charlson = 3	1.616	<.0001	1.388	<.0001	1.330	<.0001	1.558	<.0001
Charlson = 4	1.553	<.0001	1.361	<.0001	1.454	<.0001	1.572	<.0001
Charlson = 5	1.664	<.0001	1.335	0.0116	1.257	0.1009	1.725	<.0001
Charlson = 6	1.510	0.0005	1.292	0.0127	1.558	0.0006	1.841	<.0001
Charlson > 6	1.672	<.0001	1.742	<.0001	1.264	0.12	1.356	0.0116
N	36767		35714		17399		33934	
Events	23308		29143		14202		25626	
Censored	13459		6571		3197		8308	

Table 2.3: Impact of Marital Status at Diagnosis on Survival of Men (Page 3 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Ca.	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.030	<.0001	1.053	<.0001	1.030	<.0001	1.052	<.0001
Spouse Dead at Dx	1.005	0.8024	0.966	0.1744	0.952	0.0158	0.885	<.0001
Age Equivalents								
Spouse Dead at Dx	0.169		-0.670		-1.664		-2.410	
Race (vs. White)								
Black	1.099	0.0196	1.228	<.0001	1.042	0.2343	1.261	0.001
Hispanic	1.194	0.0022	1.034	0.6686	1.072	0.2943	1.051	0.6201
Asian	1.571	0.0003	0.863	0.2581	0.988	0.9147	0.917	0.6715
Other	1.767	<.0001	1.544	<.0001	1.654	<.0001	1.735	<.0001
Medicaid Recipient	1.059	0.1283	1.288	<.0001	1.117	0.0009	1.319	<.0001
ZIP Median Income (\$1000)	0.998	0.0081	0.998	0.0093	0.997	0.0002	0.997	0.0112
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations	0.864	<.0001	1.034	0.4365	1.123	0.0025	1.080	0.1348
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.089	0.0562	1.224	0.0005	1.150	0.0026	1.342	<.0001
Charlson = 2	1.198	0.0002	1.308	<.0001	1.278	<.0001	1.522	<.0001
Charlson = 3	1.270	<.0001	1.491	<.0001	1.199	0.0003	1.885	<.0001
Charlson = 4	1.302	0.001	1.590	<.0001	1.288	0.0014	2.019	<.0001
Charlson = 5	1.433	0.0011	1.668	0.0015	1.282	0.0477	2.317	<.0001
Charlson = 6	1.489	<.0001	3.598	<.0001	1.837	<.0001	3.057	<.0001
Charlson > 6	1.835	<.0001	4.511	<.0001	1.874	<.0001	3.352	<.0001

Table 2.3: Impact of Marital Status at Diagnosis on Survival of Men (Page 4 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Ca.	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.029	0.4311	1.077	0.1095	1.035	0.3801	1.040	0.4537
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.108	0.0405	1.314	<.0001	1.096	0.0601	1.266	0.0006
Charlson = 2	1.241	<.0001	1.213	0.0049	1.102	0.0668	1.395	<.0001
Charlson = 3	1.325	<.0001	1.614	<.0001	1.034	0.6083	1.488	<.0001
Charlson = 4	1.174	0.1103	1.607	<.0001	1.158	0.0997	1.259	0.1192
Charlson = 5	1.215	0.1842	1.710	0.0025	1.178	0.2159	1.391	0.1317
Charlson = 6	1.207	0.1363	2.099	<.0001	1.302	0.0229	1.586	0.0107
Charlson > 6	1.227	0.155	1.977	<.0001	1.084	0.5054	2.124	<.0001
3rd Year Before Admission								
No Hospitalizations	1.093	0.012	1.051	0.2704	1.071	0.0756	1.036	0.4893
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.149	0.0063	1.165	0.0153	1.107	0.0386	1.176	0.0209
Charlson = 2	1.156	0.0106	1.222	0.0053	1.112	0.0525	1.096	0.2485
Charlson = 3	1.497	<.0001	1.365	0.0007	1.103	0.1593	1.438	0.0006
Charlson = 4	1.160	0.2357	1.254	0.1217	1.135	0.2053	1.990	<.0001
Charlson = 5	1.078	0.7075	1.551	0.0575	1.156	0.4421	1.330	0.27
Charlson = 6	1.540	0.0017	1.396	0.0569	0.960	0.7817	1.185	0.4608
Charlson > 6	1.457	0.0426	1.651	0.0352	1.101	0.6391	1.249	0.4036
N	14532		12073		14901		8842	
Events	12912		8420		14047		5998	
Censored	1620		3653		854		2844	

Table 2.4: Impact of Marital Status at Diagnosis on Survival of Women

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.064	<.0001	1.052	<.0001	1.061	<.0001	1.066	<.0001
Spouse Dead at Dx	0.995	0.7545	1.015	0.228	0.944	<.0001	1.023	0.0727
Age Equivalents								
Spouse Dead at Dx	-0.081		0.294		-0.973		0.356	
Race (vs. White)								
Black	1.028	0.2671	0.930	<.0001	0.963	0.1846	0.956	0.006
Hispanic	1.034	0.3909	0.926	0.021	0.916	0.0207	0.930	0.034
Asian	0.973	0.7864	1.095	0.2877	0.926	0.3323	0.864	0.0485
Other	1.478	<.0001	1.353	<.0001	1.208	<.0001	1.359	<.0001
Medicaid Recipient								
	1.107	<.0001	1.128	<.0001	1.205	<.0001	1.106	<.0001
ZIP Median Income (\$1000)								
	0.998	<.0001	1.003	<.0001	1.002	<.0001	1.000	0.2917
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations								
Charlson = 0	1.065	0.008	1.053	0.0007	0.981	0.2336	0.982	0.3094
Charlson = 1	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 2	1.378	<.0001	1.233	<.0001	1.340	<.0001	1.241	<.0001
Charlson = 3	1.615	<.0001	1.424	<.0001	1.588	<.0001	1.455	<.0001
Charlson = 4	1.764	<.0001	1.510	<.0001	1.734	<.0001	1.583	<.0001
Charlson = 5	1.892	<.0001	1.797	<.0001	1.843	<.0001	1.743	<.0001
Charlson = 6	2.125	<.0001	1.886	<.0001	1.957	<.0001	1.821	<.0001
Charlson > 6	2.568	<.0001	3.065	<.0001	2.852	<.0001	2.444	<.0001
	2.526	<.0001	2.648	<.0001	2.773	<.0001	2.643	<.0001

Table 2.4: Impact of Marital Status at Diagnosis on Survival of Women (Page 2 of 4)

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.061	0.0094	1.122	<.0001	0.998	0.9182	1.017	0.3288
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.203	<.0001	1.215	<.0001	1.293	<.0001	1.168	<.0001
Charlson = 2	1.349	<.0001	1.340	<.0001	1.403	<.0001	1.281	<.0001
Charlson = 3	1.508	<.0001	1.401	<.0001	1.444	<.0001	1.324	<.0001
Charlson = 4	1.547	<.0001	1.513	<.0001	1.652	<.0001	1.470	<.0001
Charlson = 5	1.519	<.0001	1.564	<.0001	1.790	<.0001	1.491	<.0001
Charlson = 6	1.707	<.0001	2.057	<.0001	1.955	<.0001	1.740	<.0001
Charlson > 6	1.899	<.0001	1.747	<.0001	1.794	<.0001	1.529	<.0001
3rd Year Before Admission								
No Hospitalizations	1.052	0.0227	1.065	<.0001	1.027	0.0914	0.999	0.9672
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.215	<.0001	1.145	<.0001	1.299	<.0001	1.159	<.0001
Charlson = 2	1.351	<.0001	1.229	<.0001	1.397	<.0001	1.243	<.0001
Charlson = 3	1.488	<.0001	1.420	<.0001	1.469	<.0001	1.334	<.0001
Charlson = 4	1.542	<.0001	1.562	<.0001	1.426	<.0001	1.493	<.0001
Charlson = 5	1.581	<.0001	1.497	<.0001	1.698	<.0001	1.494	<.0001
Charlson = 6	1.482	0.0002	1.523	<.0001	1.513	<.0001	1.552	<.0001
Charlson > 6	1.286	0.0247	1.733	<.0001	2.134	<.0001	1.565	<.0001
N	50750		70616		77640		68102	
Events	33529		52884		51956		49329	
Censored	17221		17732		25684		18773	

Table 2.4: Impact of Marital Status at Diagnosis on Survival of Women (Page 3 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Ca.	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.032	<.0001	1.049	<.0001	1.033	<.0001	1.056	<.0001
Spouse Dead at Dx	1.010	0.5801	0.929	0.0016	1.013	0.5422	0.933	0.121
Age Equivalents								
Spouse Dead at Dx	0.316		-1.540		0.398		-1.273	
Race (vs. White)								
Black	1.141	<.0001	1.155	<.0001	1.049	0.2319	1.180	0.0208
Hispanic	1.165	0.0051	0.978	0.7749	1.094	0.2688	0.770	0.0581
Asian	1.088	0.5394	1.000	0.9993	0.906	0.5271	0.516	0.1858
Other	1.475	<.0001	1.428	<.0001	1.578	<.0001	1.656	<.0001
Medicaid Recipient	1.017	0.4755	1.249	<.0001	1.034	0.242	1.191	0.0008
ZIP Median Income (\$1000)	0.999	0.2513	1.000	0.7388	0.998	0.0035	0.997	0.0266
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations	0.874	<.0001	0.986	0.6718	1.116	0.0035	0.969	0.5808
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.083	0.0276	1.160	0.0009	1.166	0.0009	1.180	0.0397
Charlson = 2	1.132	0.0019	1.349	<.0001	1.242	<.0001	1.336	0.0014
Charlson = 3	1.113	0.0406	1.540	<.0001	1.381	<.0001	1.470	0.0008
Charlson = 4	1.136	0.1243	1.807	<.0001	1.461	<.0001	1.734	0.0009
Charlson = 5	1.393	0.0057	1.952	<.0001	1.287	0.0749	1.429	0.1477
Charlson = 6	1.334	<.0001	2.877	<.0001	1.554	<.0001	3.023	<.0001
Charlson > 6	1.836	<.0001	3.898	<.0001	1.768	<.0001	2.687	<.0001

Table 2.4: Impact of Marital Status at Diagnosis on Survival of Women (Page 4 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Ca.	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.025	0.3933	0.950	0.1499	0.988	0.7556	1.061	0.3559
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.058	0.1762	1.197	0.0002	1.088	0.0955	1.164	0.0935
Charlson = 2	1.102	0.039	1.210	0.0008	1.022	0.6973	1.288	0.0111
Charlson = 3	1.124	0.0662	1.339	0.0003	1.103	0.1813	1.364	0.0149
Charlson = 4	1.044	0.6463	1.295	0.0391	1.097	0.4142	1.482	0.0661
Charlson = 5	1.065	0.6997	1.780	0.0006	1.164	0.3432	1.092	0.7895
Charlson = 6	1.372	0.0108	1.660	<.0001	1.364	0.0066	1.838	0.0016
Charlson > 6	0.984	0.911	1.090	0.5926	0.954	0.7595	2.425	0.0022
3rd Year Before Admission								
No Hospitalizations	1.010	0.7289	0.969	0.3812	1.066	0.0968	1.041	0.5277
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.038	0.3885	1.110	0.0424	1.115	0.0283	1.199	0.0453
Charlson = 2	1.123	0.0206	1.116	0.0683	1.128	0.0415	1.503	<.0001
Charlson = 3	1.137	0.0574	1.258	0.0054	1.148	0.0833	0.999	0.9959
Charlson = 4	1.110	0.3552	1.291	0.0649	1.169	0.1778	1.713	0.022
Charlson = 5	1.652	0.0127	1.399	0.2063	1.580	0.0226	1.108	0.8046
Charlson = 6	1.318	0.037	1.547	0.0014	1.043	0.7723	1.625	0.1002
Charlson > 6	1.247	0.2164	1.825	0.0075	1.289	0.1509	3.669	0.0062
N								
Events	21022		19379		14050		5501	
Censored	18116		12644		12696		3612	
	2906		6735		1354		1889	

Table 2.5: Characteristics of the Married Members of COSI

	Men	Women
N=	108,368	58,416
Age	77.3	76.2
Race		
White	90.2%	91.3%
Black	4.2%	4.7%
Hispanic	2.3%	2.5%
Asian	0.6%	0.5%
Other	2.7%	1.0%
Medicaid Beneficiary	6.5%	9.7%
Median Income (\$1000)	29.9	29.8
Primary Diagnosis		
Heart Attack	22.9%	18.4%
C.H.F.	19.4%	19.3%
Stroke	19.2%	20.3%
Hip Fracture	8.1%	19.5%
Any Cancer	30.5%	22.5%
Lung	8.9%	5.4%
Colon	7.3%	7.2%
Urinary Tract	5.4%	2.0%
Bad Cancers	8.9%	8.0%
Liver & Biliary Tract	0.7%	0.7%
C.N.S.	0.6%	0.5%
Head & Neck	1.1%	0.6%
Lymphoma	3.1%	3.2%
Leukemia	2.1%	1.6%
Pancreatic	1.2%	1.4%
Comorbidity Adjustment		
Charlson Score (1st Yr. Mean)	0.57	0.50
Any Hospitalization (1st Yr.)	29.6%	28.9%
Hospitalizations (1st Yr. Mean)	0.49	0.49
Charlson Score (2nd Yr. Mean)	0.40	0.35
Any Hospitalization (2nd Yr.)	24.3%	23.5%
Hospitalizations (2nd Yr. Mean)	0.38	0.37
Charlson Score (3rd Yr. Mean)	0.31	0.28
Any Hospitalization (3rd Yr.)	21.7%	21.1%
Hospitalizations (3rd Yr. Mean)	0.33	0.32
Survival (Days)	1040.8	1244.5
% Dying by 6/30/99	72.5%	62.5%
Spouse Dies First	9.0%	25.1%
Spouse Dies Same Period	0.4%	0.7%

Table 2.6: Cox Models for Mortality for Married COSI Cohort

	Men		Women	
	<u>H.R.</u>	<u>p</u>	<u>H.R.</u>	<u>p</u>
Age (1 yr.)	1.055	<.0001	1.054	<.0001
Spouse Dead 0y - 1y	1.244	<.0001	1.169	<.0001
Spouse Dead 1y - 2y	1.147	<.0001	1.099	0.0008
Spouse Dead 2y - 3y	1.194	<.0001	1.052	0.1325
Spouse Dead > 3y	1.089	0.0196	1.085	0.0106
Age Equivalents				
Spouse Dead 0y - 1y	4.078		2.969	
Spouse Dead 1y - 2y	2.562		1.795	
Spouse Dead 2y - 3y	3.312		0.964	
Spouse Dead > 3y	1.592		1.551	
Race (vs. White)				
Black	1.086	<.0001	0.974	0.3011
Hispanic	0.969	0.1893	0.878	0.0001
Asian	0.987	0.7919	0.854	0.0433
Other	1.624	<.0001	1.317	<.0001
Medicaid Recipient	1.148	<.0001	1.190	<.0001
ZIP Median Income (\$1000)	0.998	<.0001	0.999	0.0264
Primary Diagnosis				
Heart Attack	1.000	(ref.)	1.000	(ref.)
C.H.F.	1.435	<.0001	1.181	<.0001
Stroke	1.159	<.0001	1.048	0.0075
Hip Fracture	1.117	<.0001	0.745	<.0001
Cancers:				
Lung	3.565	<.0001	3.335	<.0001
Colon	1.160	<.0001	1.035	0.1684
Liver	4.010	<.0001	4.021	<.0001
C.N.S.	4.380	<.0001	4.015	<.0001
Head & Neck	1.652	<.0001	1.382	<.0001
Pancreas	4.632	<.0001	5.093	<.0001
Lymphoma	2.148	<.0001	2.005	<.0001
Leukemia	2.203	<.0001	2.056	<.0001
Urinary Tract	1.033	0.0804	1.023	0.5879

(continued)

Table 2.6: Cox Models for Married COSI Cohort (Page 2 of 2)

	Men <u>H.R.</u>	p	Women <u>H.R.</u>	p
Comorbidity Measures				
1st Year Before Admission				
No Hospitalizations	1.089	<.0001	1.039	0.0667
Charlson = 0	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.322	<.0001	1.332	<.0001
Charlson = 2	1.579	<.0001	1.567	<.0001
Charlson = 3	1.689	<.0001	1.764	<.0001
Charlson = 4	1.874	<.0001	1.923	<.0001
Charlson = 5	2.046	<.0001	2.084	<.0001
Charlson = 6	2.712	<.0001	2.715	<.0001
Charlson > 6	2.570	<.0001	2.815	<.0001
2nd Year Before Admission				
No Hospitalizations	1.081	<.0001	1.025	0.2502
Charlson = 0	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.253	<.0001	1.220	<.0001
Charlson = 2	1.359	<.0001	1.424	<.0001
Charlson = 3	1.443	<.0001	1.567	<.0001
Charlson = 4	1.484	<.0001	1.684	<.0001
Charlson = 5	1.523	<.0001	1.786	<.0001
Charlson = 6	1.745	<.0001	1.806	<.0001
Charlson > 6	1.894	<.0001	2.101	<.0001
3rd Year Before Admission				
No Hospitalizations	1.100	<.0001	1.043	0.0459
Charlson = 0	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.275	<.0001	1.289	<.0001
Charlson = 2	1.350	<.0001	1.379	<.0001
Charlson = 3	1.517	<.0001	1.436	<.0001
Charlson = 4	1.619	<.0001	1.656	<.0001
Charlson = 5	1.587	<.0001	1.598	<.0001
Charlson = 6	1.447	<.0001	1.584	<.0001
Charlson > 6	1.644	<.0001	1.626	<.0001
N	108,368		58,416	
Died	78,526		36,484	
Censored	29,842		21,932	

Table 2.7: Impact of Loss of a Spouse on Survival of Men

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.073	<.0001	1.053	<.0001	1.060	<.0001	1.067	<.0001
Spouse Dead 0y - 1y	1.227	0.0003	1.172	0.0006	1.226	0.0014	1.247	<.0001
Spouse Dead 1y - 2y	1.194	0.0098	1.117	0.0625	1.037	0.6639	1.198	0.0022
Spouse Dead 2y - 3y	1.251	0.0056	1.069	0.3619	1.170	0.1048	1.152	0.0533
Spouse Dead > 3y	1.239	0.0057	0.905	0.2005	1.032	0.7625	1.034	0.6599
Age Equivalents								
Spouse Dead 0y - 1y	2.903		3.073		3.497		3.404	
Spouse Dead 1y - 2y	2.517		2.143		0.624		2.786	
Spouse Dead 2y - 3y	3.178		1.292		2.694		2.182	
Spouse Dead > 3y	3.042		-1.933		0.541		0.516	
Race (vs. White)								
Black	1.088	0.0778	1.012	0.7482	1.067	0.4204	1.071	0.0529
Hispanic	0.909	0.0893	0.920	0.1197	0.870	0.1103	0.958	0.4049
Asian	1.170	0.1848	0.822	0.0637	1.009	0.9616	0.770	0.0161
Other	1.870	<.0001	1.447	<.0001	1.404	<.0001	1.535	<.0001
Medicaid Recipient	1.170	<.0001	1.119	0.0002	1.171	<.0001	1.171	<.0001
ZIP Median Income (\$1000)	0.996	<.0001	0.999	0.3467	0.999	0.5342	0.998	0.0009
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations	1.148	0.0004	1.157	<.0001	1.032	0.5298	1.066	0.0812
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.552	<.0001	1.291	<.0001	1.389	<.0001	1.320	<.0001
Charlson = 2	1.934	<.0001	1.524	<.0001	1.718	<.0001	1.648	<.0001
Charlson = 3	2.250	<.0001	1.659	<.0001	1.741	<.0001	1.593	<.0001
Charlson = 4	2.601	<.0001	1.649	<.0001	1.799	<.0001	2.011	<.0001
Charlson = 5	2.496	<.0001	2.078	<.0001	2.081	<.0001	2.063	<.0001
Charlson = 6	3.280	<.0001	3.451	<.0001	2.052	<.0001	2.761	<.0001
Charlson > 6	3.482	<.0001	3.399	<.0001	2.371	<.0001	2.828	<.0001

Table 2.7: Impact of Loss of a Spouse on Survival of Men (Page 2 of 4)

	Heart Attack	C.H.F.	Hip Fracture	Stroke
2nd Year Before Admission				
No Hospitalizations	1.096	1.096	1.090	1.082
Charlson = 0	1.000 (ref.)	1.000 (ref.)	1.000 (ref.)	1.000 (ref.)
Charlson = 1	1.279 <.0001	1.234 <.0001	1.350 <.0001	1.294 <.0001
Charlson = 2	1.452 <.0001	1.320 <.0001	1.360 <.0001	1.440 <.0001
Charlson = 3	1.602 <.0001	1.475 <.0001	1.394 <.0001	1.471 <.0001
Charlson = 4	1.465 <.0001	1.426 <.0001	1.531 <.0001	1.583 <.0001
Charlson = 5	1.566 <.0001	1.344 <.0001	1.462 <.0001	1.752 <.0001
Charlson = 6	1.676 <.0001	1.734 <.0001	1.615 <.0001	1.839 <.0001
Charlson > 6	1.893 <.0001	2.371 <.0001	1.764 <.0001	2.265 <.0001
3rd Year Before Admission				
No Hospitalizations	1.040	1.112	1.085	1.093
Charlson = 0	1.000 (ref.)	1.000 (ref.)	1.000 (ref.)	1.000 (ref.)
Charlson = 1	1.280 <.0001	1.225 <.0001	1.376 <.0001	1.301 <.0001
Charlson = 2	1.500 <.0001	1.273 <.0001	1.350 <.0001	1.437 <.0001
Charlson = 3	1.744 <.0001	1.488 <.0001	1.333 <.0001	1.622 <.0001
Charlson = 4	1.650 <.0001	1.527 <.0001	1.706 <.0001	1.763 <.0001
Charlson = 5	1.689 <.0001	1.457 <.0001	1.265 <.0001	1.932 <.0001
Charlson = 6	1.423 <.0001	1.195 <.0001	1.901 <.0001	2.018 <.0001
Charlson > 6	2.002 <.0001	1.677 <.0001	1.313 <.0001	1.793 <.0001
N	24811	20977	8742	20818
Died	14358	16380	6720	14847
Censored	10453	4597	2022	5971
% Dying by end of follow-up	57.9%	78.1%	76.9%	71.3%
Predeceasing spouse	2390	2025	1058	2128
% with Predeceasing Spouse	9.6%	9.7%	12.1%	10.2%
Spouse Dies at Same Time (n)	73	97	65	64

Table 2.7: Impact of Loss of a Spouse on Survival of Men (Page 3 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.031	<.0001	1.049	<.0001	1.031	<.0001	1.053	<.0001
Spouse Dead 0y - 1y	1.265	0.0036	1.341	0.0004	1.143	0.1388	1.338	0.0033
Spouse Dead 1y - 2y	0.972	0.8239	0.958	0.7239	0.858	0.3588	1.348	0.0175
Spouse Dead 2y - 3y	1.162	0.3281	1.252	0.0905	1.020	0.9282	1.335	0.0691
Spouse Dead > 3y	0.935	0.7001	1.064	0.6539	1.227	0.3408	1.530	0.0031
Age Equivalents								
Spouse Dead 0y - 1y	7.700		6.134		4.378		5.638	
Spouse Dead 1y - 2y	-0.930		-0.897		-5.017		5.782	
Spouse Dead 2y - 3y	4.918		4.698		0.649		5.595	
Spouse Dead > 3y	-2.201		1.297		6.701		8.235	
Race (vs. White)								
Black	1.174	0.0028	1.335	<.0001	1.024	0.6084	1.380	0.0018
Hispanic	1.237	0.0033	1.078	0.4392	1.053	0.5369	1.062	0.6114
Asian	1.921	<.0001	0.954	0.7678	1.061	0.6809	1.203	0.4505
Other	1.859	<.0001	1.599	<.0001	1.704	<.0001	1.573	<.0001
Medicaid Recipient	1.064	0.2341	1.246	0.001	1.128	0.01	1.265	0.0034
ZIP Median Income (\$1000)	0.998	0.0187	0.997	0.0216	0.997	0.0004	0.996	0.0029
Comorbidity Measures								
1st Year Before Admission	0.900	0.008	1.079	0.1787	1.137	0.0078	1.091	0.1807
No Hospitalizations	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 0	1.147	0.0154	1.334	0.0002	1.209	0.0012	1.303	0.0023
Charlson = 1	1.334	<.0001	1.366	0.0002	1.245	0.0009	1.540	<.0001
Charlson = 2	1.431	<.0001	1.558	<.0001	1.204	0.0169	2.184	<.0001
Charlson = 3	1.275	0.0186	1.464	0.0139	1.477	0.0002	2.013	<.0001
Charlson = 4	1.476	0.0073	1.666	0.0195	1.181	0.3225	2.159	0.002
Charlson = 5	1.652	<.0001	5.020	<.0001	1.933	<.0001	4.017	<.0001
Charlson = 6	2.006	<.0001	4.250	<.0001	1.994	<.0001	3.925	<.0001

Table 2.7: Impact of Loss of a Spouse on Survival of Men (Page 4 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.035	0.4462	1.088	0.1622	1.024	0.6411	1.044	0.5279
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.092	0.1663	1.237	0.0114	1.133	0.0483	1.300	0.0043
Charlson = 2	1.291	0.0001	1.288	0.0044	1.091	0.1962	1.561	<.0001
Charlson = 3	1.311	0.0025	1.709	<.0001	1.069	0.4239	1.572	0.0003
Charlson = 4	1.482	0.003	1.703	0.0008	1.163	0.169	1.682	0.005
Charlson = 5	1.384	0.0891	1.939	0.0036	1.143	0.4536	1.715	0.0469
Charlson = 6	1.279	0.1402	2.309	<.0001	1.398	0.0221	1.854	0.0056
Charlson > 6	1.522	0.0208	1.794	0.0052	1.263	0.122	1.789	0.0118
3rd Year Before Admission								
No Hospitalizations	1.125	0.008	1.075	0.219	1.115	0.026	1.115	0.109
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.207	0.0036	1.324	0.0007	1.135	0.0417	1.309	0.0043
Charlson = 2	1.236	0.0032	1.140	0.1624	1.223	0.0036	1.143	0.1996
Charlson = 3	1.664	<.0001	1.449	0.0025	1.070	0.4455	1.428	0.0124
Charlson = 4	1.176	0.3566	1.282	0.1762	1.193	0.1816	1.978	0.0004
Charlson = 5	0.918	0.7656	1.673	0.1579	1.279	0.3082	1.905	0.0749
Charlson = 6	1.442	0.0211	1.363	0.1554	1.043	0.8287	1.332	0.3254
Charlson > 6	1.478	0.0987	1.682	0.0564	1.249	0.3712	1.892	0.0416
N	9609		7904		9688		5819	
Died	8369		5184		9018		3650	
Censored	1240		2720		670		2169	
% Dying by end of follow-up	87.1%		65.6%		93.1%		62.7%	
Predeceasing spouse	484		746		307		575	
% with Predeceasing Spouse	5.0%		9.4%		3.2%		9.9%	
Spouse Dies at Same Time (n)	27		34		25		28	

Table 2.8: Impact of Loss of a Spouse on Survival of Women

	Heart Attack	C.H.F.	Hip Fracture	Stroke	p
	H.R.	H.R.	H.R.	H.R.	
Age (1 yr.)	1.067	1.047	1.060	1.068	<.0001
Spouse Dead 0y - 1y	1.212	1.122	1.230	1.184	0.0006
Spouse Dead 1y - 2y	1.119	0.946	1.007	1.112	0.0742
Spouse Dead 2y - 3y	1.107	0.864	1.013	1.005	0.9431
Spouse Dead > 3y	1.244	1.053	0.896	0.922	0.2618
Age Equivalents					
Spouse Dead 0y - 1y	2.965	2.506	3.553	2.567	
Spouse Dead 1y - 2y	1.734	-1.209	0.120	1.614	
Spouse Dead 2y - 3y	1.567	-3.183	0.222	0.076	
Spouse Dead > 3y	3.367	1.124	-1.885	-1.234	
Race (vs. White)					
Black	1.045	0.946	0.991	0.967	0.4757
Hispanic	1.002	0.904	0.745	0.796	0.0025
Asian	1.114	0.807	0.889	0.814	0.1630
Other	1.392	1.128	1.092	1.408	0.0033
Medicaid Recipient	1.191	1.155	1.314	1.174	<.0001
ZIP Median Income (\$1000)	0.996	1.001	1.002	0.999	0.2334
Comorbidity Measures					
1st Year Before Admission					
No Hospitalizations	1.160	1.123	0.967	1.061	0.2312
Charlson = 0	1.000	1.000	1.000	1.000	(ref.)
Charlson = 1	1.554	1.370	1.455	1.346	<.0001
Charlson = 2	1.871	1.559	1.808	1.726	<.0001
Charlson = 3	2.164	1.658	2.178	1.915	<.0001
Charlson = 4	2.216	1.788	2.124	2.001	<.0001
Charlson = 5	2.366	2.327	1.722	2.154	<.0001
Charlson = 6	3.230	4.460	3.384	3.407	<.0001
Charlson > 6	4.395	3.035	5.121	4.037	<.0001

Table 2.8: Impact of Loss of a Spouse on Survival of Women (Page 2 of 4)

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.100	0.1011	1.096	0.0365	0.971	0.5381	0.971	0.5351
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.343	<.0001	1.220	0.0007	1.351	<.0001	1.152	0.0176
Charlson = 2	1.595	<.0001	1.470	<.0001	1.565	<.0001	1.355	<.0001
Charlson = 3	1.880	<.0001	1.438	<.0001	1.758	<.0001	1.446	<.0001
Charlson = 4	1.854	<.0001	1.532	0.0012	1.898	<.0001	1.622	<.0001
Charlson = 5	1.882	<.0001	1.847	0.0008	2.183	<.0001	1.656	<.0001
Charlson = 6	1.920	<.0001	1.647	0.0033	1.864	0.0004	2.038	<.0001
Charlson > 6	2.984	<.0001	3.888	<.0001	3.751	<.0001	1.656	0.0039
3rd Year Before Admission								
No Hospitalizations	1.095	0.1104	1.080	0.0879	0.958	0.3539	1.080	0.0974
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.446	<.0001	1.198	0.0028	1.224	0.0013	1.385	<.0001
Charlson = 2	1.519	<.0001	1.413	<.0001	1.442	<.0001	1.412	<.0001
Charlson = 3	1.594	<.0001	1.496	<.0001	1.222	0.0574	1.477	<.0001
Charlson = 4	1.826	<.0001	2.151	<.0001	1.119	0.5294	1.694	<.0001
Charlson = 5	1.414	0.0594	2.011	0.0037	1.291	0.3359	1.971	<.0001
Charlson = 6	1.703	0.0251	1.553	0.0265	1.636	0.0232	1.784	0.0010
Charlson > 6	1.022	0.9410	1.397	0.2533	3.511	<.0001	2.347	0.0021
N	10729		11277		11389		11858	
Died	5888		7470		6181		7417	
Censored	4841		3807		5208		4441	
% Dying by end of follow-up	54.9%		66.2%		54.3%		62.5%	
Predeceasing spouse	2622		2930		4020		3012	
% with Predeceasing Spouse	24.4%		26.0%		35.3%		25.4%	
Spouse Dies at Same Time (n)	69		81		90		96	

Table 2.8: Impact of Loss of a Spouse on Survival of Women (Page 3 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.031	<.0001	1.044	<.0001	1.032	<.0001	1.063	<.0001
Spouse Dead 0y - 1y	0.925	0.4215	1.169	0.0828	1.041	0.7212	0.955	0.8182
Spouse Dead 1y - 2y	1.337	0.0148	1.097	0.4265	1.342	0.0650	1.386	0.1408
Spouse Dead 2y - 3y	1.007	0.9676	1.355	0.0216	0.813	0.4506	0.960	0.8960
Spouse Dead > 3y	1.108	0.5439	1.036	0.8037	1.580	0.0400	1.571	0.0883
Age Equivalents								
Spouse Dead 0y - 1y	-2.554		3.626		1.276		-0.754	
Spouse Dead 1y - 2y	9.513		2.150		9.339		5.343	
Spouse Dead 2y - 3y	0.228		7.055		-6.572		-0.668	
Spouse Dead > 3y	3.359		0.821		14.522		7.394	
Race (vs. White)								
Black	0.993	0.9380	1.232	0.0208	0.911	0.3786	0.958	0.8405
Hispanic	0.958	0.6801	1.022	0.8861	1.007	0.9614	1.001	0.9975
Asian	1.099	0.7085	0.844	0.5296	0.783	0.4011	0.605	0.6180
Other	1.900	<.0001	0.895	0.6339	1.407	0.0425	2.306	0.0016
Medicaid Recipient	1.038	0.5887	1.436	<.0001	1.179	0.0517	1.113	0.5002
ZIP Median Income (\$1000)	0.998	0.1751	1.001	0.7022	0.994	0.0002	0.993	0.0728
Comorbidity Measures								
1st Year Before Admission	0.835	0.0017	0.934	0.3889	1.059	0.4849	1.122	0.4909
No Hospitalizations	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 0	1.046	0.5882	1.261	0.0399	1.140	0.2097	1.331	0.1953
Charlson = 1	1.144	0.1439	1.225	0.1401	1.163	0.1970	1.498	0.1056
Charlson = 2	1.193	0.1386	1.478	0.0202	1.061	0.7145	2.331	0.0033
Charlson = 3	1.088	0.6824	2.631	<.0001	1.999	0.0013	1.990	0.1023
Charlson = 4	1.530	0.1463	1.572	0.2763	3.606	0.0766	2.690	0.1734
Charlson = 5	1.439	0.0187	3.142	<.0001	1.619	0.0008	2.921	0.0018
Charlson = 6	2.066	<.0001	3.693	<.0001	1.727	0.0004	1.615	0.3576

Table 2.8: Impact of Loss of a Spouse on Survival of Women (Page 4 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.085	0.2200	0.984	0.8544	0.892	0.2144	0.984	0.9221
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.038	0.7085	1.307	0.0302	0.998	0.9876	1.154	0.5375
Charlson = 2	1.089	0.4388	1.353	0.0292	0.968	0.8117	1.215	0.5124
Charlson = 3	1.161	0.3196	1.436	0.1008	0.977	0.8953	2.060	0.0208
Charlson = 4	1.117	0.6640	1.207	0.5330	1.170	0.5412	1.157	0.7677
Charlson = 5	0.681	0.3678	1.749	0.1884	1.287	0.5342	2.862	0.1855
Charlson = 6	1.606	0.0695	1.965	0.0047	1.208	0.3870	2.898	0.0013
Charlson > 6	1.613	0.1177	1.231	0.6254	1.090	0.7956	2.031	0.4888
3rd Year Before Admission								
No Hospitalizations	1.080	0.2796	0.999	0.9864	1.074	0.3591	0.979	0.8972
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.133	0.2437	1.275	0.0622	1.333	0.0071	1.137	0.6216
Charlson = 2	1.045	0.7216	1.216	0.1842	1.143	0.3227	1.677	0.0617
Charlson = 3	1.450	0.0171	1.599	0.0145	1.313	0.1213	2.564	0.0387
Charlson = 4	1.591	0.0783	0.964	0.9284	1.124	0.6867	1.726	0.3484
Charlson = 5	1.454	0.5043	.	.	1.053	0.9035	0.741	0.7811
Charlson = 6	1.634	0.0542	1.858	0.0053	1.111	0.6899	5.010	0.0168
Charlson > 6	1.461	0.2531	9.157	0.0003	1.280	0.4636	4.349	0.1777
N	4647		4185		3174		1157	
Died	3801		2312		2799		616	
Censored	846		1873		375		541	
% Dying by end of follow-up	81.8%		55.2%		88.2%		53.2%	
Predeceasing spouse	533		1000		284		244	
% with Predeceasing Spouse	11.5%		23.9%		8.9%		21.1%	
Spouse Dies at Same Time (n)	37		28		23		7	

Table 2.9: Characteristics of the Spouses of the COSI Cohort

	Male Spouses of Female COSI Cohort Members	Female Spouses of Male COSI Cohort Members
N=	58,416	108,368
Age	79.1	75.0
Race		
White	91.5%	91.3%
Black	4.7%	4.3%
Hispanic	0.5%	0.6%
Asian	2.4%	2.2%
Other	0.9%	1.6%
Medicaid Beneficiary	9.7%	6.5%
Median Income (\$1000)	29.8	29.9
Comorbidity Adjustment		
3-Yr. Charlson	0.750	0.448
Hospitalized in last 3 years?	91.1%	62.5%
Survival (Days)	1659.2	1955.9
% Dying	46.6%	22.9%

Table 2.10: Impact of Loss of a COSI Women on Male Spouses' Survival

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.083	<.0001	1.082	<.0001	1.088	<.0001	1.081	<.0001
Proband Dead 0y - 1y	1.252	<.0001	1.212	<.0001	1.159	0.0009	1.170	0.0003
Proband Dead 1y - 2y	1.138	0.0181	1.071	0.1585	1.214	<.0001	1.056	0.2668
Proband Dead 2y - 3y	1.010	0.8736	1.047	0.3973	1.150	0.0148	1.103	0.0626
Proband Dead > 3y	1.135	0.0067	1.066	0.1623	1.001	0.9864	1.110	0.0186
Age Equivalents								
Proband Dead 0y - 1y	2.819		2.440		1.750		2.016	
Proband Dead 1y - 2y	1.621		0.870		2.299		0.700	
Proband Dead 2y - 3y	0.125		0.583		1.657		1.259	
Proband Dead > 3y	1.588		0.811		0.012		1.340	
Race (vs. White)								
Black	0.830	0.0157	1.095	0.1145	0.830	0.0734	0.969	0.5567
Hispanic	0.912	0.3392	0.714	0.0003	0.730	0.0017	0.858	0.0966
Asian	0.907	0.6990	0.682	0.1071	0.704	0.1754	0.671	0.0251
Other	1.191	0.2559	1.172	0.2462	1.310	0.0328	1.096	0.4946
Medicaid Recipient	1.263	<.0001	1.193	<.0001	1.256	<.0001	1.181	<.0001
ZIP Median Income (\$1000)	0.997	0.0311	0.999	0.4683	0.999	0.4553	0.999	0.2283
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations	0.973	0.6775	0.999	0.9874	0.952	0.3723	0.946	0.3361
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.739	<.0001	1.468	<.0001	1.416	<.0001	1.635	<.0001
Charlson = 2	1.908	<.0001	1.865	<.0001	1.690	<.0001	1.807	<.0001
Charlson = 3	2.522	<.0001	2.130	<.0001	1.984	<.0001	2.096	<.0001
Charlson = 4	2.349	<.0001	2.570	<.0001	2.711	<.0001	2.162	<.0001
Charlson = 5	2.680	<.0001	2.111	<.0001	2.191	<.0001	3.403	<.0001
Charlson = 6	3.659	<.0001	3.507	<.0001	4.444	<.0001	3.500	<.0001
Charlson > 6	5.040	<.0001	4.990	<.0001	5.660	<.0001	4.764	<.0001

Table 2.10: Impact of Loss of a COSI Women on Male Spouses' Survival (Page 2 of 4)

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission	1.037	0.5594	1.064	0.2751	0.973	0.6025	1.041	0.4737
No Hospitalizations	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 0	1.512	<.0001	1.480	<.0001	1.269	0.0006	1.514	<.0001
Charlson = 1	1.602	<.0001	1.669	<.0001	1.459	<.0001	1.498	<.0001
Charlson = 2	1.845	<.0001	1.907	<.0001	1.667	<.0001	2.033	<.0001
Charlson = 3	2.129	<.0001	1.908	<.0001	1.695	<.0001	1.911	<.0001
Charlson = 4	2.381	<.0001	1.945	0.0002	1.846	0.0026	1.703	0.0110
Charlson = 5	3.319	<.0001	1.855	0.0017	2.257	0.0001	2.249	<.0001
Charlson = 6	3.484	<.0001	1.811	0.0153	2.265	0.0007	1.450	0.1079
Charlson > 6								
3rd Year Before Admission	0.960	0.4787	1.050	0.3907	0.974	0.5981	1.083	0.1496
No Hospitalizations	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 0	1.214	0.0140	1.397	<.0001	1.226	0.0030	1.454	<.0001
Charlson = 1	1.420	<.0001	1.695	<.0001	1.494	<.0001	1.656	<.0001
Charlson = 2	1.773	<.0001	1.553	<.0001	1.499	<.0001	1.824	<.0001
Charlson = 3	1.969	<.0001	2.353	<.0001	1.963	<.0001	1.736	0.0006
Charlson = 4	0.872	0.6884	2.379	0.0003	2.531	0.0007	2.361	0.0002
Charlson = 5	1.971	0.0034	2.147	0.0023	1.581	0.0371	2.331	<.0001
Charlson = 6	2.691	0.0067	1.418	0.2811	1.958	0.0281	1.710	0.0791
Charlson > 6								
N	10729		11277		11389		11858	
Died	4746		5502		5993		5628	
Censored	5983		5775		5396		6230	
% Dying by end of follow-up	44.2%		48.8%		52.6%		47.5%	
Predeceasing spouse	5017		6112		4512		6107	
% with Predeceasing Spouse	46.8%		54.2%		39.6%		51.5%	
Spouse Dies at Same Time (n)	69		81		90		96	

Table 2.10: Impact of Loss of a COSI Women on Male Spouses' Survival (Page 3 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.086	<.0001	1.090	<.0001	1.079	<.0001	1.098	<.0001
Proband Dead 0y - 1y	1.435	<.0001	1.426	<.0001	1.269	0.0120	1.308	0.0906
Proband Dead 1y - 2y	1.363	0.0002	1.166	0.0974	1.181	0.1127	1.191	0.3394
Proband Dead 2y - 3y	1.107	0.2611	1.359	0.0012	1.217	0.0743	1.638	0.0061
Proband Dead > 3y	1.157	0.0604	1.280	0.0031	1.161	0.1555	1.379	0.0490
Age Equivalents								
Proband Dead 0y - 1y	4.378		4.118		3.133		2.872	
Proband Dead 1y - 2y	3.754		1.782		2.188		1.870	
Proband Dead 2y - 3y	1.232		3.559		2.583		5.278	
Proband Dead > 3y	1.768		2.865		1.963		3.437	
Race (vs. White)								
Black	1.008	0.9454	1.018	0.8684	1.158	0.3181	1.069	0.7917
Hispanic	1.079	0.6090	0.817	0.2910	1.120	0.6062	1.090	0.7812
Asian	0.592	0.2001	1.186	0.5592	0.512	0.1885	0.000	0.9570
Other	1.464	0.0763	1.455	0.0701	3.012	<.0001	0.987	0.9751
Medicaid Recipient	1.208	0.0306	1.347	0.0009	1.227	0.0816	1.042	0.8207
ZIP Median Income (\$1000)	1.000	0.9937	0.998	0.4227	0.997	0.2489	1.002	0.6379
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations	1.064	0.5899	0.955	0.6644	1.096	0.5365	1.281	0.2914
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.789	<.0001	1.455	0.0054	1.609	0.0080	2.118	0.0081
Charlson = 2	2.486	<.0001	1.575	0.0014	1.699	0.0041	1.486	0.1944
Charlson = 3	2.136	<.0001	2.375	<.0001	2.269	<.0001	2.853	0.0023
Charlson = 4	2.901	<.0001	1.858	0.0138	3.708	<.0001	3.860	0.0005
Charlson = 5	3.519	<.0001	3.583	<.0001	1.196	0.6861	5.155	0.0133
Charlson = 6	3.985	<.0001	2.361	0.0031	4.009	<.0001	6.625	0.0001
Charlson > 6	9.645	<.0001	4.675	<.0001	8.714	<.0001	11.235	0.0004

Table 2.10: Impact of Loss of a COSI Women on Male Spouses' Survival (Page 4 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.002	0.9880	1.029	0.7701	1.134	0.3331	0.798	0.2469
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.425	0.0064	1.427	0.0079	1.436	0.0329	1.964	0.0047
Charlson = 2	1.323	0.0510	1.752	<.0001	1.883	0.0002	1.356	0.2468
Charlson = 3	2.140	<.0001	1.830	0.0004	3.404	<.0001	2.242	0.0125
Charlson = 4	1.305	0.2798	1.848	0.0071	2.945	0.0001	2.600	0.1701
Charlson = 5	2.111	0.0533	2.751	0.0016	7.660	<.0001	6.814	0.0047
Charlson = 6	2.638	0.0029	2.961	<.0001	0.764	0.6381	1.861	0.3204
Charlson > 6	1.857	0.0616	4.852	<.0001	16.850	<.0001	2.831	0.1019
3rd Year Before Admission								
No Hospitalizations	0.982	0.8504	0.995	0.9592	0.944	0.6414	1.195	0.3708
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.592	0.0001	1.365	0.0209	1.399	0.0408	1.215	0.4416
Charlson = 2	1.580	0.0016	2.013	<.0001	1.429	0.0519	0.963	0.9093
Charlson = 3	1.699	0.0038	2.441	<.0001	2.062	0.0004	0.732	0.4855
Charlson = 4	2.110	0.0085	1.863	0.0119	1.398	0.2936	1.986	0.4335
Charlson = 5	4.223	0.0061	6.241	0.0011	1.567	0.5376	0.585	0.4804
Charlson = 6	2.894	0.0144	1.319	0.7831	1.248	0.6241	.	.
Charlson > 6	5.419	0.0031	0.684	0.5983	5.093	0.0110	.	.
N	4647		4185		3174		1157	
Died	1856		1753		1271		449	
Censored	2791		2432		1903		708	
% Dying by end of follow-up	39.9%		41.9%		40.0%		38.8%	
Predeceasing spouse	3500		1948		2610		529	
% with Predeceasing Spouse	75.3%		46.5%		82.2%		45.7%	
Spouse Dies at Same Time (n)	37		28		23		7	

Table 2.11: Impact of Loss of a COSI Men on Female Spouses' Survival (Page 2 of 4)

	Heart Attack		C.H.F.		Hip Fracture		Stroke	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	1.035	0.5538	0.969	0.5580	0.816	0.0055	0.974	0.6425
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.720	<.0001	1.634	<.0001	1.337	0.0029	1.468	<.0001
Charlson = 2	1.924	<.0001	1.968	<.0001	1.289	0.0225	1.900	<.0001
Charlson = 3	2.158	<.0001	1.728	<.0001	1.836	<.0001	1.734	<.0001
Charlson = 4	2.521	<.0001	2.598	<.0001	2.232	0.0010	2.265	<.0001
Charlson = 5	2.596	<.0001	2.320	<.0001	1.313	0.4932	3.217	<.0001
Charlson = 6	4.210	<.0001	4.690	<.0001	2.554	0.0005	3.219	<.0001
Charlson > 6	2.916	<.0001	1.285	0.4004	2.433	0.1027	0.974	0.9427
3rd Year Before Admission								
No Hospitalizations	1.007	0.9095	0.891	0.0285	1.002	0.9784	0.939	0.2609
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.510	<.0001	1.332	<.0001	1.476	0.0002	1.499	<.0001
Charlson = 2	1.696	<.0001	1.519	<.0001	1.475	0.0009	1.610	<.0001
Charlson = 3	1.969	<.0001	1.955	<.0001	1.721	0.0006	1.838	<.0001
Charlson = 4	2.368	<.0001	1.876	0.0002	2.321	0.0026	2.049	<.0001
Charlson = 5	1.835	0.0142	2.110	0.0059	6.867	<.0001	1.801	0.0547
Charlson = 6	1.949	0.0009	1.857	0.0017	1.851	0.0930	1.790	0.0478
Charlson > 6	2.548	0.0074	2.043	0.1558	3.113	0.0312	2.791	0.0009
N	24811		20977		8742		20818	
Died	4990		5316		2674		4901	
Censored	19821		15661		6068		15917	
% Dying by end of follow-up	20.1%		25.3%		30.6%		23.5%	
Predeceasing spouse	13377		15118		6018		13626	
% with Predeceasing Spouse	53.9%		72.1%		68.8%		65.5%	
Spouse Dies at Same Time (n)	73		97		65		64	

Table 2.11: Impact of Loss of a COSI Men on Female Spouses' Survival (Page 3 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
Age (1 yr.)	1.089	<.0001	1.101	<.0001	1.086	<.0001	1.092	<.0001
Proband Dead 0y - 1y	1.136	0.0987	1.194	0.0281	1.157	0.0872	1.397	0.0002
Proband Dead 1y - 2y	1.107	0.2085	1.178	0.0560	1.282	0.0060	1.103	0.3506
Proband Dead 2y - 3y	1.155	0.0910	1.209	0.0366	1.238	0.0258	0.989	0.9216
Proband Dead > 3y	1.254	0.0043	1.150	0.0746	1.338	0.0019	1.148	0.1422
Age Equivalents								
Proband Dead 0y - 1y	1.496		1.843		1.768		3.799	
Proband Dead 1y - 2y	1.192		1.703		3.011		1.114	
Proband Dead 2y - 3y	1.690		1.973		2.588		-0.126	
Proband Dead > 3y	2.655		1.453		3.529		1.568	
Race (vs. White)								
Black	0.874	0.2422	1.167	0.1620	1.206	0.0413	1.124	0.5289
Hispanic	0.832	0.2214	0.859	0.4216	0.715	0.0871	1.303	0.2010
Asian	0.727	0.3445	0.637	0.2713	0.645	0.2868	1.260	0.6074
Other	0.335	<.0001	0.302	<.0001	0.496	0.0004	0.685	0.0933
Medicaid Recipient	1.316	0.0024	1.033	0.7725	1.100	0.2751	0.856	0.2650
ZIP Median Income (\$1000)	1.001	0.5989	0.997	0.1348	1.003	0.1046	0.996	0.1472
Comorbidity Measures								
1st Year Before Admission								
No Hospitalizations	0.801	0.0187	0.863	0.1444	1.003	0.9799	0.899	0.3929
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.375	0.0114	1.538	0.0014	1.906	<.0001	1.855	<.0001
Charlson = 2	1.938	<.0001	2.360	<.0001	2.210	<.0001	2.676	<.0001
Charlson = 3	2.175	<.0001	2.603	<.0001	2.537	<.0001	2.526	<.0001
Charlson = 4	3.851	<.0001	2.971	<.0001	2.843	<.0001	3.182	<.0001
Charlson = 5	2.354	0.0044	2.272	0.0379	3.993	<.0001	4.434	<.0001
Charlson = 6	3.880	<.0001	3.776	<.0001	8.468	<.0001	3.684	<.0001
Charlson > 6	7.429	<.0001	7.294	<.0001	13.677	<.0001	3.588	0.0060

Table 2.11: Impact of Loss of a COSI Men on Female Spouses' Survival (Page 4 of 4)

	Bad Cancer		Colon Cancer		Lung Cancer		Urinary Tract Cancer	
	H.R.	p	H.R.	p	H.R.	p	H.R.	p
2nd Year Before Admission								
No Hospitalizations	0.949	0.5885	1.013	0.8958	0.924	0.3891	0.967	0.7803
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.545	0.0006	1.522	0.0034	1.461	0.0020	1.306	0.1064
Charlson = 2	1.910	<.0001	1.781	<.0001	1.748	<.0001	2.084	<.0001
Charlson = 3	2.353	<.0001	1.881	0.0007	1.792	0.0003	3.280	<.0001
Charlson = 4	3.171	<.0001	3.252	<.0001	1.548	0.0644	2.190	0.0061
Charlson = 5	3.761	0.0001	1.307	0.6579	1.049	0.9063	6.476	0.0118
Charlson = 6	4.489	<.0001	1.866	0.0858	2.692	0.0001	4.404	<.0001
Charlson > 6	6.042	<.0001	4.270	0.0004	0.886	0.7350	5.912	0.0030
3rd Year Before Admission								
No Hospitalizations	0.940	0.4909	1.170	0.1616	0.994	0.9440	0.953	0.6874
Charlson = 0	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)	1.000	(ref.)
Charlson = 1	1.575	0.0003	1.777	0.0001	1.506	0.0010	1.554	0.0073
Charlson = 2	1.618	0.0006	1.888	0.0002	1.484	0.0053	1.375	0.1048
Charlson = 3	2.055	<.0001	3.098	<.0001	1.855	0.0003	1.004	0.9886
Charlson = 4	2.477	0.0005	2.387	0.0045	2.607	0.0006	1.524	0.1893
Charlson = 5	4.192	0.0152	5.285	<.0001	8.274	<.0001	3.944	0.0068
Charlson = 6	1.308	0.4503	4.663	<.0001	2.427	0.0242	2.125	0.1041
Charlson > 6	2.679	0.2011	2.624	0.1114	6.982	<.0001	2.312	0.1466
N	9609		7904		9688		5819	
Died	1995		1647		2117		1186	
Censored	7614		6257		7571		4633	
% Dying by end of follow-up	20.8%		20.8%		21.9%		20.4%	
Predeceasing spouse	8036		4810		8787		3353	
% with Predeceasing Spouse	83.6%		60.9%		90.7%		57.6%	
Spouse Dies at Same Time (n)	27		34		25		28	

Table 2.12: Impact of Alzheimer's Disease on Mortality in Men

<u>Whose Mortality?</u>	<u>Whose Alzheimer's?</u>	<u>Bereavement</u>	<u>Coefficient</u>	<u>SE</u>	<u>p-value</u>
Male Probands	Spouse	0-1y	0.217	0.023	<.0001
		1-2y	0.121	0.030	<.0001
		2-3y	0.152	0.037	<.0001
		>3y	0.094	0.038	0.0127
		0-1y * Alz	-0.061	0.101	0.5484
		1-2y * Alz	0.096	0.122	0.4318
		2-3y * Alz	0.209	0.136	0.1245
		>3y * Alz	-0.189	0.147	0.1995
Male Spouses	Proband	0-1y	0.210	0.021	<.0001
		1-2y	0.123	0.023	<.0001
		2-3y	0.109	0.025	<.0001
		>3y	0.107	0.022	<.0001
		0-1y * Alz	-0.082	0.079	0.3043
		1-2y * Alz	0.066	0.084	0.4313
		2-3y * Alz	-0.124	0.099	0.2108
		>3y * Alz	-0.085	0.080	0.2852
Male Probands	Proband	0-1y	0.212	0.023	<.0001
		1-2y	0.124	0.030	<.0001
		2-3y	0.157	0.036	<.0001
		>3y	0.076	0.037	0.0423
		0-1y * Alz	-0.031	0.100	0.7577
		1-2y * Alz	-0.024	0.132	0.853
		2-3y * Alz	0.088	0.156	0.5731
		>3y * Alz	-0.048	0.179	0.7902

Table 2.13: Impact of Alzheimer's Disease on Mortality in Women

<u>Whose Mortality?</u>	<u>Whose Alzheimer's?</u>	<u>Bereavement</u>	<u>Coefficient</u>	<u>SE</u>	<u>p-value</u>
Female Probands	Spouse	0-1y	0.155	0.023	<.0001
		1-2y	0.066	0.029	0.0227
		2-3y	0.018	0.035	0.6018
		>3y	0.034	0.033	0.3067
		0-1y * Alz	-0.019	0.104	0.8574
		1-2y * Alz	0.098	0.118	0.4037
		2-3y * Alz	-0.032	0.142	0.8206
		>3y * Alz	0.023	0.117	0.8464
Female Spouses	Proband	0-1y	0.224	0.030	<.0001
		1-2y	0.106	0.032	0.0012
		2-3y	0.108	0.035	0.0019
		>3y	0.152	0.030	<.0001
		0-1y * Alz	-0.073	0.134	0.5882
		1-2y * Alz	0.204	0.130	0.1159
		2-3y * Alz	0.053	0.141	0.7059
		>3y * Alz	0.027	0.115	0.8122
Female Probands	Proband	0-1y	0.146	0.024	<.0001
		1-2y	0.073	0.029	0.0127
		2-3y	-0.003	0.035	0.9271
		>3y	0.024	0.033	0.4644
		0-1y * Alz	0.045	0.085	0.5983
		1-2y * Alz	-0.075	0.111	0.4992
		2-3y * Alz	0.184	0.119	0.1232
		>3y * Alz	0.069	0.118	0.5592

Table 2.14: Selection into COSI

		<u>Wives</u>		Total
		In COSI	Not in COSI	
<u>Husbands</u>	In COSI	3,590	108,934	112,524
	Not in COSI	57,225	1,649,069	1,706,294
	Total	60,815	1,758,003	1,818,818

Odds ratio = .950 [95% Conf. Interval: .918 - .983]

Chi-squared(1) = 8.71 p = 0.0032

Table 2.15: Tests for Violation of Proportionality Assumption for Bereavement Effects

	<u>Men</u>		<u>Women</u>	
	<u>Chi-Square</u>	<u>p-value</u>	<u>Chi-Square</u>	<u>p-value</u>
Heart Attack	13.0	0.011	3.0	0.552
C.H.F.	7.2	0.124	0.9	0.919
Hip Fracture	1.4	0.839	4.0	0.403
Stroke	2.2	0.690	7.5	0.111
Bad Cancer	2.0	0.730	9.5	0.050
Colon Cancer	4.5	0.345	3.1	0.539
Lung Cancer	9.6	0.048	2.6	0.631
Urinary Tract Cancer	9.7	0.045	7.5	0.113

Table 2.16: Violation of Proportionality Assumption on Age

Men	<u>Age</u>	<u>Interaction</u>	<u>Interaction SE</u>	<u>1 Month Effect</u>	<u>5 Year Effect</u>
Heart Attack	0.062	0.00042	0.00006	0.67%	40%
C.H.F.	0.048	0.00020	0.00006	0.42%	25%
Hip Fracture	0.057	0.00006	0.00009	0.10%	6%
Stroke	0.061	0.00016	0.00006	0.26%	16%
Bad Cancer	0.027	0.00031	0.00012	1.16%	69%
Colon Cancer	0.042	0.00027	0.00012	0.64%	38%
Lung Cancer	0.033	-0.00033	0.00016	-1.00%	-60%
Urinary Tract Cancer	0.042	0.00045	0.00013	1.08%	65%
Women	<u>Age</u>	<u>Interaction</u>	<u>Interaction SE</u>	<u>1 Month Effect</u>	<u>5 Year Effect</u>
Heart Attack	0.060	0.00029	0.00010	0.48%	29%
C.H.F.	0.042	0.00021	0.00009	0.49%	30%
Hip Fracture	0.045	0.00045	0.00010	1.00%	60%
Stroke	0.062	0.00015	0.00009	0.23%	14%
Bad Cancer	0.027	0.00022	0.00018	0.81%	49%
Colon Cancer	0.043	-0.00001	0.00018	-0.01%	-1%
Lung Cancer	0.032	-0.00002	0.00027	-0.05%	-3%
Urinary Tract Cancer	0.060	0.00004	0.00036	0.07%	4%

Non-proportionality is tested by interacted age with time since diagnosis. The example effects are shown for the proportionate change in the age coefficient 1 month and 5 years after diagnosis.

Table 3.1: Summary of Hypotheses

Theory	Focus	Disease Ranking	Male Support	Female Support
Current Period Models				
A Direct Physiology	Proband	Cancer > CHF, stroke, hip > MI	No	No
B1 Emotional – Stress Buffering	Proband	CHF, stroke, hip > MI	No	No
B2 Emotional – Perceived Support	Proband	Non-Alz. > Alz. CHF > MI, Cancer	Incon- clusive	Incon- clusive
C Social Control (Umberson)	Proband	Time Course: up, and increasing thereafter	Partial	Partial
Social Support – D1 Informal Groups (Litwak)	Proband	Stroke, hip > colon, lung > MI, CHF > CNS, pancreatic cancer	Partial	Partial
Social Support – D2 Day to Day Care	Proband	CHF, hip, stroke > MI	No	No
Social Support – D3 Information Provision	Proband	MI > others Non-Alz. Spouse > Alz. Spouse	Yes	Yes
D4 Kin-Keeping	Proband	Time Course: tapering as adaptation occurs MI, Cancer > CHF, hip, stroke in Proband	Incon- clusive	Incon- clusive
E1 Social Capital – Physical	Spouse	Time Course: unrelated to time proband sick Non-Alz > Alz. in Proband	Modest	No
E2 Social Capital – Intellectual	Spouse	Time Course: unrelated to time proband sick	Incon- clusive	Incon- clusive

Table 3.1: Summary of Hypotheses (continued)

Theory	Focus	Disease Ranking	Male Support	Female Support
Investment Models				
F1 Pure Investment	Proband	Time Course: gradual increase of relative hazard	No	No
F2 Investment + Shocks	Proband	Time Course: up, and increasing thereafter	No	No
F3 Investment + Shocks + Reinvestment	Proband	Time Course: Bereavement: Bad Ca, Lung Ca > CHF, Stroke > MI, Colon Ca	No	No
G Lillard & Waite Assets	Spouse	For women: CHF > Colon Ca, Lung Ca in probands		No
Alternative Hypotheses				
H Caregiving Fatigue Selection:	Spouse	within CHF, hip, stroke, the Hazard Ratio of loss decreases with time since diagnosis.	No	No
S1 Positive Assortative Mating	Either	Impact of marital status loss decreases with age	No	No
S2 Selection: Joint Health Shocks	Both	Increased likelihood of both being in COSI	No	No
S3 Selection: Joint Health Shocks	Either	Impact of loss less if spouse lost to cardiac arrest MI, CHF, lung > Colon, hip > CNS Ca., Lymphoma/Leukemia	Incon- clusive	Incon- clusive
S4 Selection: Joint Poor Health Behavior	Proband		Weak	Weak

Table 4.1: Characteristics of Cohort for Hospital Choice Analyses

n	455,594
Age	80.3
Male	33.6%
White	89.9%
Medicaid Recipient	13.6%
ZIP-code Median Income (\$1000)	29.9
<u>Primary Diagnosis:</u>	
Heart Attack	17.4%
C.H.F.	21.4%
Hip Fracture	19.3%
Colon Cancer	6.3%
Lung Cancer	5.6%
Stroke	20.4%
Urinary Tract Cancer	2.8%
Bad Cancer	7.0%
Charlson Score (3-year Mean)	1.00
Widowed at Diagnosis	65.7%
<u>Initial Hospital Characteristics:</u>	
Teaching Hospital	11.2%
U.S. News & World Report Ranked	6.5%
Technology Index	7.17
Length of Stay (days)	7.4
Died During Initial Hospitalization	10.2%
Early Readmission (if survived initial admission)	20.4%
Complications: DesHairnes Definition	7.7%
Complications: CDC Definition	1.9%

**Table 4.2: Impact of Marital Status on Likelihood of Choosing
A Teaching Hospital or a U.S. News-Ranked Hospital**

	Teaching Hospital		US News & World Report			
	Coefficient	Odds Ratio	p-value	Coefficient	Odds Ratio	p-value
Intercept	-3.572		0.000	-4.080		0.000
Age	-0.017	0.983	0.000	-0.020	0.980	0.000
Male	0.028	1.029	0.141	0.050	1.051	0.033
White	-0.413	0.662	0.000	-0.384	0.681	0.000
Medicaid	-0.119	0.887	0.000	-0.244	0.784	0.000
Median Income of ZIP (\$1K)	-0.001	0.999	0.230	0.008	1.008	0.000
Widowed at Diagnosis	-0.102	0.903	0.000	-0.150	0.860	0.000
Widowed at Diagnosis * Male	0.011	1.011	0.675	0.012	1.012	0.701
M.I.		1.000	<ref>		1.000	<ref>
C.H.F.	-0.020	0.980	0.256	0.017	1.017	0.459
Hip Fracture	-0.033	0.968	0.082	0.006	1.006	0.814
Stroke	-0.168	0.845	0.000	-0.143	0.867	0.000
Bad Cancer	0.552	1.736	0.000	0.809	2.246	0.000
Colon Cancer	0.144	1.155	0.000	0.300	1.350	0.000
Lung Cancer	0.253	1.287	0.000	0.405	1.500	0.000
Urinary Tract Cancer	0.319	1.376	0.000	0.542	1.719	0.000
Charlson Score	-0.007	0.993	0.041	0.000	1.000	0.952

Unit-specific models with all variables group-mean centered and only intercept with level-2 random effect

**Table 4.3: Impact of Marital Status on
Technology-Level of Hospital Chosen**

	Technology Index	
	<u>Coefficient</u>	<u>p-value</u>
Intercept	5.971	0.000
Age	-0.027	0.000
Male	0.104	0.000
White	-0.204	0.001
Medicaid	-0.410	0.000
Median Income of ZIP (\$1K)	0.010	0.001
Widowed at Diagnosis	-0.062	0.002
Widowed at Diagnosis * Male	-0.097	0.000
Heart Attack	1.000	<ref>
C.H.F.	-0.159	0.000
Hip Fracture	0.253	0.000
Stroke	-0.225	0.000
Bad Cancer	0.716	0.000
Colon Cancer	0.242	0.000
Lung Cancer	0.504	0.000
Urinary Tract Cancer	0.615	0.000
Charlson Score	-0.012	0.001

Note that this outcome variable is continuous
 Level-1 Variance component: 11.78
 Level-2 Variance component: 4.56

Table 4.4: Impact of Marital Status on Length of Stay

	Length of Stay (natural log)	
	<u>Coefficient</u>	<u>p-value</u>
Intercept	1.997	0.000
Age	0.003	0.000
Male	-0.036	0.000
White	-0.037	0.000
Medicaid	0.045	0.000
Median Income of ZIP (\$1K)	-0.001	0.000
Widowed at Diagnosis	0.009	0.003
Widowed at Diagnosis * Male	0.018	0.000
Heart Attack	0.000	<ref.>
C.H.F.	0.125	0.000
Hip Fracture	0.291	0.000
Stroke	0.099	0.000
Bad Cancer	0.188	0.000
Colon Cancer	0.472	0.000
Lung Cancer	0.197	0.000
Urinary Tract Cancer	-0.078	0.000
Charlson Score	0.014	0.000

Note that this outcome variable is continuous.

Level-1 Variance component: 0.393

Level-2 Variance component: 0.050

Table 4.5: Impact of Marital Status on Suffering a Complication

	Any Complications		
	<u>Coefficient</u>	<u>Odds Ratio</u>	<u>p-value</u>
Intercept	-2.575		0.000
Age	-0.005	0.995	0.000
Male	0.124	1.132	0.000
White	0.113	1.120	0.000
Medicaid	0.050	1.051	0.004
Median Income of ZIP (\$1K)	0.001	1.001	0.367
Widowed at Diagnosis	-0.092	0.912	0.000
Widowed at Diagnosis * Male	0.034	1.034	0.178
Heart Attack		1.000	<ref>
C.H.F.	0.322	1.380	0.000
Hip Fracture	0.869	2.385	0.000
Stroke	1.344	3.835	0.000
Bad Cancer	0.728	2.072	0.000
Colon Cancer	-0.278	0.757	0.000
Lung Cancer	0.768	2.155	0.000
Urinary Tract Cancer	0.480	1.615	0.000
Charlson Score	-0.025	0.976	0.000

Unit-specific models with all variables group-mean centered
and only intercept with level-2 random effect

Table 4.6: Impact of Marital Status on Early Readmission Rates

	Early Readmission Rate		
	<u>Coefficient</u>	<u>Odds Ratio</u>	<u>p-value</u>
Intercept	-1.281		0.000
Age	-0.027	0.974	0.000
Male	0.112	1.118	0.000
White	0.024	1.025	0.108
Medicaid	-0.167	0.846	0.000
Median Income of ZIP (\$1K)	-0.002	0.998	0.001
Widowed at Diagnosis	0.001	1.001	0.968
Widowed at Diagnosis * Male	0.002	1.002	0.938
Heart Attack		1.000	<ref.>
C.H.F.	-0.781	0.458	0.000
Hip Fracture	-0.219	0.803	0.000
Stroke	-0.315	0.729	0.000
Bad Cancer	-0.662	0.516	0.000
Colon Cancer	-1.110	0.330	0.000
Lung Cancer	-0.770	0.463	0.000
Urinary Tract Cancer	-1.192	0.304	0.000
Charlson Score	0.009	1.010	0.000

Unit-specific models with all variables group-mean centered and only intercept with level-2 random effect

Table A.1: ICD-9-CM Operationalizations of COSI Diagnoses

	<u>ICD-9 Codes</u>	<u>Source</u>	<u>Others Considered</u>
Non-Cancer			
Heart Attack	410.0-410.9 (exclude 410.x2)	Jollis et al. 1996; Krumholz et al. 1998	Asch et al. 1995; Draper et al. 1990; Fisher et al. 1992
C.H.F.	398.91,402.01, 402.11,402.91, 404.01,404.03, 404.11,404.13, 404.91,404.93, 428.0-428.9	Taylor Jr., Whellan and Sloan 1999	Asch et al. 1995; Draper et al. 1990; Elixhauser et al. 1998; Fisher et al. 1992; Krumholz et al. 1997
Hip fracture	820-820.9	Fisher et al. 1992	Lauderdale et al. 1997
Stroke	434, 436	Benesch et al. 1997; ** Holloway et al. 1996	Asch et al. 1995; Draper et al. 1990; Fisher et al. 1992; Lee, Huber and Stason 1996; Taylor Jr., Whellan and Sloan 1999; Wolinsky et al. 1998
Cancer			
Colorectal	153-154.8	Fisher et al. 1992	McBean, Warren and Babish (1994) use colon only
Lung	162.2-162.9	McBean, Babish and Warren 1993, 1994	
Urinary *	188-189	Ries et al. 1997	
CNS	191, 192, 194.3, 194.4	our own	Counsell, Collie and Grant (1997), Loomis and Savitz (1990) and McKinney et al. (1994) used intracranial tumors only
Head/Neck	140-149, 161	our own	Allison, Franco and Feine (1998), Allison, Locker and Feine (1998), and Ries et al. (1997) were combined for this project.
Leukemia	204-208.9	Loomis and Savitz 1990; Ries et al. 1997; Ventrees and Manton 1986	
Lymphoma	200-203; 238.6	Ries et al. 1997	
Liver/biliary	155-156	Ries et al. 1997	
Pancreatic	157	Ries et al. 1997	

* Urinary Tract cancers do *not* include prostate cancers.

** Benesch et al. (1997) provided a comparison of multiple definitions with chart-review.

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Table A.2: Alternative Definitions of Incidence: Unique Index Hospitalizations

	1° position		any position	
	<u>prevalent</u>	<u>incident</u>	<u>prevalent</u>	<u>incident</u>
Non-Cancer				
Heart Attack	256,183	234,098	323,736	296,144
CHF	494,845	299,161	1,294,707	833,027 (sample = 277,676)
Hip fracture	218,729	207,927	228,677	216,431
Stroke	268,222	241,479	334,016	300,093
Cancer				
Colorectal	78,189	72,165	98,877	84,093
Lung	58,077	51,072	110,243	87,619
Urinary Tract	39,553	31,142	54,964	40,897
“Bad” Cancers:				
Leukemia	9,505	7,168	34,940	22,017
Lymphoma	22,182	16,671	53,042	34,327
Pancreatic	12,834	11,661	19,233	16,225
Liver/biliary	7,383	6,695	11,290	9,655
CNS	5,636	5,103	7,230	6,276
Head/Neck	9,051	7,848	14,127	11,428

Bold numbers indicate the choice made for this project. This is based on acute inpatient hospitalizations with age at least 68 for any hospitalization (that is, without any geographic restrictions, claims completeness, or date validity checks)

Table A.3: Alternative Estimates of the Incidence of COSI Diagnoses in the Elderly, in thousands of events per year

	<u>SEER</u>	<u>1993 MedPAR *</u>	<u>COSI</u>
Colorectal	91	95	84
Lung	125	104	86
Leukemia	16	24.5	22
Lymphoma	38	39	34
Pancreatic	20	18	16
Liver/biliary	12.5	11.6	10
CNS	6.3	8.8	7.4
Head/Neck	14.8	14.3	11.6
Urinary Tract	59	47	41

* 1993 MedPAR, *any age*, no look-back to exclude incident cases.

Source: SEER data is from Ries, Lynn A. Gloeckler, Carol L. Kosary, Benjamin F. Hankey, Barry A. Miller, Angela HARRAS, and Brenda K. Edwards (Eds.). 1997. *SEER Cancer Statistics Review, 1973-1994*. Bethesda, MD: National Cancer Institute. NIH Pub. No. 97-2789. Other columns are from authors' own tabulations.

Table A.4: Number of Index Hospitalizations in 1993, by Unique Individuals

<u>Count</u>	<u>Frequency</u>	<u>Percent of Individuals</u>
1	1,144,365	92.1 %
2	93,892	7.6 %
3	3,568	0.3 %
4	109	0.0 %
5	0	0.0 %
6	1	0.0 %

This is based on acute inpatient hospitalizations with age at least 68 for any hospitalization (that is, without any geographic restrictions, claims completeness, or date validity checks)

Table A.5: Marital Status of All COSI-cohort as of Jan. 1, 1993

Men	<u>Total</u>	<u>% of Men</u>	<u>Who Died First?</u>		
			Proband	Spouse	Neither
Method I					
Proband is A	124,217	23.9%	24,334	73,376	26,507
Proband is B	3,304	0.6%	589	1,966	749
Method II					
Proband is A	119,299	22.9%	22,161	89,094	8,044
Proband is B	3,427	0.7%	942	2,064	421
Follow-Up					
Proband is A	28,021	5.4%	1,500	18,595	7,926
Proband is B	263	0.1%	23	141	99
Widowed	54,242	10.4%			
Unmatched	187,049	36.0%			
Total	519,822				
Women					
	<u>Total</u>	<u>% of Women</u>	<u>Who Died First?</u>		
			Proband	Spouse	Neither
Method I					
Proband is A	1,907	0.3%	641	839	427
Proband is B	68,567	9.6%	25,195	29,410	13,962
Method II					
Proband is A	5,387	0.8%	2,248	2,936	203
Proband is B	40,399	5.7%	16,942	17,959	5,498
Follow-Up					
Proband is A	654	0.1%	83	411	160
Proband is B	2,304	0.3%	833	983	488
Widowed	268,965	37.8%			
Unmatched	323,889	45.5%			
Total	712,072				

Table A.6: Death by End of 1997 Among Decedents

	Of Probands, Who Died by Dec. 31, 1997?	
	<u>Men</u>	<u>Women</u>
Heart Attack	53.9%	57.0%
C.H.F.	71.9%	65.8%
Hip Fracture	70.8%	54.6%
Stroke	64.2%	62.6%
 <u>Cancers</u>		
CNS	95.1%	90.6%
Colon	61.6%	57.6%
Head & Neck	72.7%	67.8%
Liver & Biliary Tract	94.6%	93.0%
Leukemia	81.4%	75.9%
Lung	92.4%	87.6%
Lymphoma	80.4%	75.7%
Pancreas	96.4%	95.0%
Urinary Tract	57.7%	58.4%
Overall	68.0%	62.6%
Number of Cases	514,732	706,421

This requires that the probands lived in the 50 states or D.C. Probands are tabulated only once, by their temporally first diagnosis if they were multiply empanelled.

Table A.7: Characteristics of Initial Hospitalization

	<u>N</u>	Length of Stay (days)			End of Stay		
		<u>Median</u>	<u>25%</u>	<u>75%</u>	<u>Transfer</u>	<u>Death (V.S.)</u>	<u>Death (Claims)</u>
Heart Attack	218,946	7	4	10	15.3%	15.8%	16.5%
C.H.F.	253,093	7	4	11	3.8%	10.1%	10.6%
Hip Fracture	210,493	8	6	11	5.6%	4.0%	4.2%
Stroke	244,259	7	4	10	5.9%	9.7%	10.1%
<u>Cancers</u>							
CNS	5,536	8	4	14	8.2%	7.7%	8.0%
Colon	80,209	10	7	15	1.2%	6.3%	6.6%
Head & Neck	10,565	6	3	12	1.7%	5.9%	6.1%
Liver & Biliary Tract	8,504	9	5	15	3.7%	15.7%	16.4%
Leukemia	20,489	6	4	11	3.9%	14.9%	15.5%
Lung	83,888	8	4	13	2.4%	13.4%	13.7%
Lymphoma	31,630	7	4	13	2.8%	9.0%	9.5%
Pancreas	14,993	9	5	16	2.9%	15.7%	16.1%
Urinary Tract	38,548	5	3	9	1.2%	3.4%	3.5%

Death (V.S.): Proband's death date as recorded in the Vital Status file is the same as discharge date from claims.

Death (Claims): Claim recorded proband's discharge disposition as discharged to dead.