

Laboratory for Quantitative Medicine
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Comparison with Adjuvant!Online

This report compares the accuracy of the
Size+Nodes+PrognosticFactors method to that of
AdjuvantOnline's.

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I. Introduction

For breast cancer, there already exists a risk prediction calculator called Adjuvant!Online. While our methodology is based on a biologically-motivated mathematical framework, the methodology that Adjuvant!Online has adopted is more empirical in nature. One shortcoming of strict empirical models is that they are only as precise as the data they are extracted from: the larger the number of variables, the smaller number of patients satisfying every criteria or classification. An undesired consequence of this approach is the considerable uncertainty that will almost certainly result. Adjuvant!Online attempts to circumscribe this issue by grouping patients into large bins. While these large bins decrease the uncertainties associated with their estimates and thus increase their statistical validity, they are not able to finely stratify patients. In a particular grouping, the patients with the highest risk (derived in theory from a large cohort of individuals resembling this patient in every respect) may actually have vastly divergent prognoses from patients with the lowest expected risk.

The inability to finely stratify patients is only one area where Adjuvant!Online falls short (see third graph in section III). Although an independent validation study has been performed for Adjuvant!Online, we have not been able to duplicate its results with our own dataset. Indeed, we found that Adjuvant!Online tends to over-predict patient risk. This is shown with the first and second graphs in section III.

The mortality risk estimates provided by Adjuvant!Online is essentially a look-up table. We re-created this look-up table and assigned each patient in our dataset the corresponding mortality risk value by this look-up table. We then grouped the patients by their Adjuvant!Online predicted risk values in 5% increments, and performed Kaplan-Meier survival analysis on each group. Because Adjuvant!Online provides 10-year estimates, comparisons are made to the empirical 10-year death rate, and not the 15-year death rate.

Because Adjuvant!Online was created and validated using data only from 1989-1993, we restricted our analysis to this time period as well. Using the entire dataset provides smaller confidence intervals, but yields essentially the same result. The following table summarizes the patient characteristics during this time period.

	Characteristic	Number
Age	31 - 40	86
	41 - 50	407
	51 - 60	333
	61 - 70	425
	71 - 80	151
Tumor size	1 - 5mm	98
	11 - 15mm	273
	16 - 20mm	267
	21 - 25mm	107
	26 - 30mm	99
	31 - 35mm	29
	36 - 40mm	50

	41 - 45mm	8
	46 - 50mm	24
	6 - 10mm	447
	0	1013
	1	163
No. positive nodes	2	101
	3	52
	4	28
	5	15
	6	12
	7	18
	Grade	1
2		431
3		283
9		508
ER status	Negative	167
	Positive	395
	Undefined	840

Section IV shows the results of performing the same analysis on the Partners dataset. Not only does the Size+Nodes+PrognosticFactors method yield more accurate results (as seen in the first graph), it provides finer risk stratification of the patients (as seen in the second graph).

II. Datasets

SEER Dataset (Breast Cancer)

Breast cancer data was extracted from the US Surveillance, Epidemiology, and End Results (SEER) dataset, which is provided by the National Cancer Institute. It consists of 17 regional registries across the US, with data from 1973 to 2004. An extensive effort was made to clean the data, for example by considering only first malignant primary tumors. Also, analysis is restricted to patients with 1-50 mm tumors and 0-7 positive lymph nodes. These patients total 362,491.

Partners Healthcare Breast Cancer Database

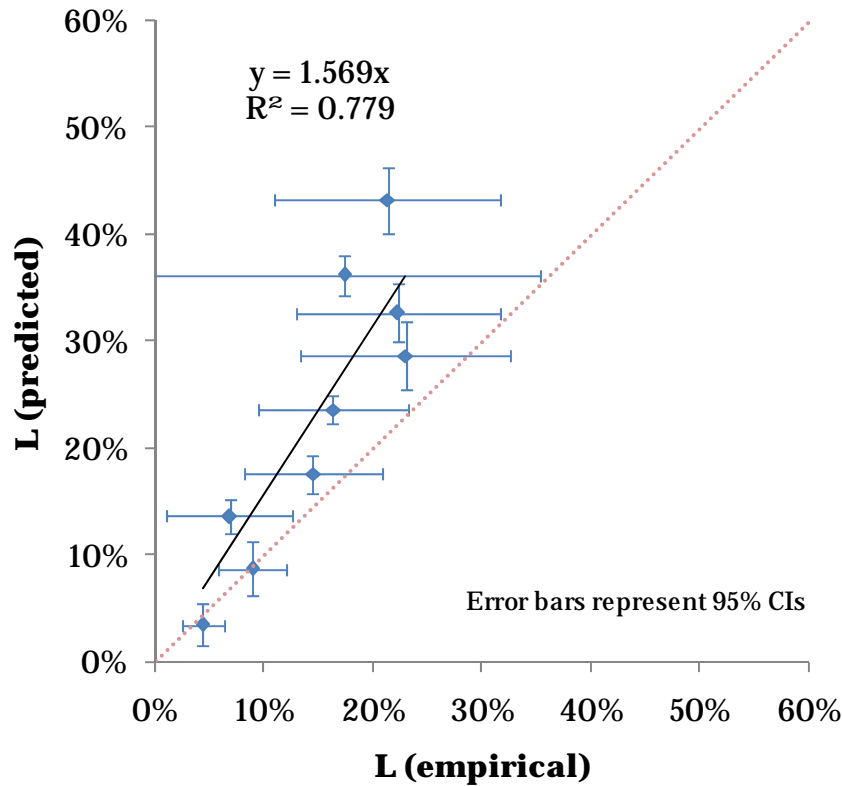
This database consists of 24,771 breast cancer patients diagnosed at the Massachusetts General Hospital or the Brigham and Women's hospital between 1968 and 2007. Analysis is restricted to patients with 1-50 mm tumors and 0-7 positive lymph nodes, a subset with 7,907 patients. For the analysis with Adjuvant!Online, the time period is restricted to 1989 to 1993.

III. Adjuvant!Online

Grouped by 5% predicted (by Adjuvant!Online) lethality bins
Using the Partners dataset

Group†	N	L empirical (SEM)		L predicted (SEM)		Difference (pred – emp)
0-5%	456	4.35%	0.98%	3.46%	1.00%	-0.88%
6-10%	322	8.91%	1.61%	8.73%	1.30%	-0.18%
11-15%	74	6.81%	2.94%	13.62%	0.86%	6.81%
16-20%	121	14.46%	3.25%	17.61%	0.92%	3.15%
21-25%	115	16.29%	3.52%	23.59%	0.67%	7.30%
26-30%	79	22.94%	4.91%	28.68%	1.58%	5.75%
31-35%	81	22.23%	4.77%	32.70%	1.36%	10.47%
36-40%	18	17.36%	9.13%	36.22%	0.94%	18.86%
41-45%	67	21.31%	5.27%	43.24%	1.57%	21.93%
<i>Mean (std. dev.)</i>						8.13% (7.86%)
<i>Mean weighted by N (std. dev.)</i>						3.28% (3.65%)
<i>Root Mean Square (std. dev.)</i>						11.00% (13.22%)
<i>Root Mean Square weighted by N (std. dev.)</i>						4.76% (5.54%)

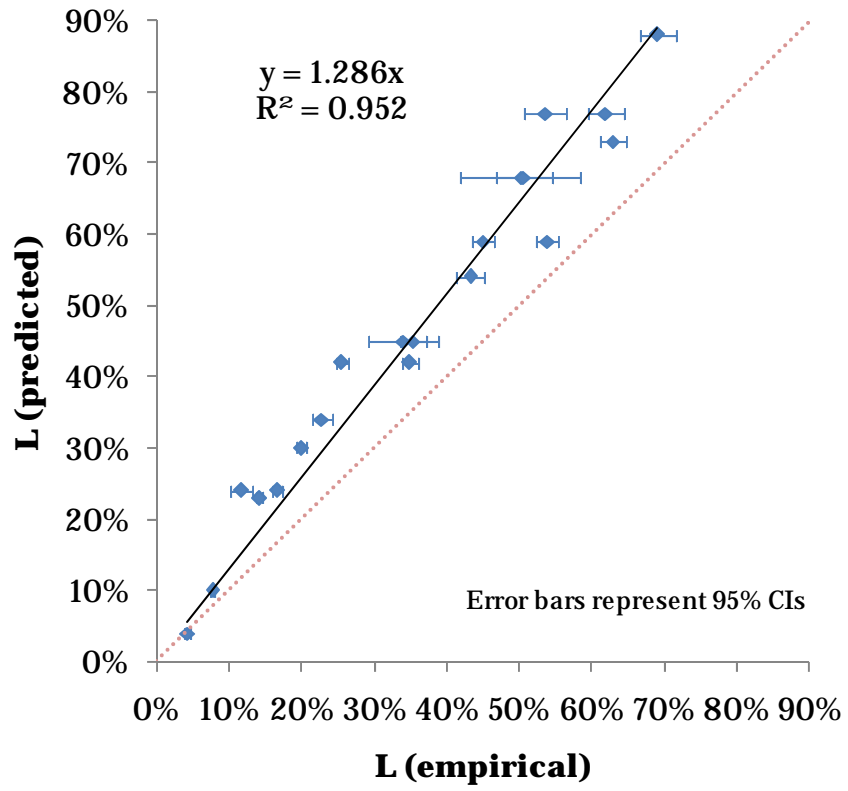
†all other groups are not included in the calculation of the mean or displayed on graph; 95% CI is greater than 20% or there is insufficient follow-up data for the group



Permutations of tumor size bins and positive lymph node bins from Adjuvant!Online
Using the SEER dataset¹

Group		N	L empirical (SEM)		L predicted (SEM)		Difference (pred – emp)
Size	Nodes						
0-10 mm	0	49168	4.23%	(0.16%)	4.00%	-	-0.23%
0-10 mm	1-3	5128	11.79%	(0.78%)	24.00%	-	12.21%
0-10 mm	4-9	789	34.02%	(2.44%)	45.00%	-	10.98%
0-10 mm	>9	278	50.16%	(4.27%)	68.00%	-	17.84%
11-20 mm	0	101620	7.75%	(0.13%)	10.00%	-	2.25%
11-20 mm	1-3	27218	16.68%	(0.38%)	24.00%	-	7.32%
11-20 mm	4-9	6163	35.34%	(0.88%)	45.00%	-	9.66%
11-20 mm	>9	1856	50.65%	(1.93%)	68.00%	-	17.35%
21-30 mm	0	47588	14.14%	(0.24%)	23.00%	-	8.86%
21-30 mm	1-3	23310	25.58%	(0.46%)	42.00%	-	16.42%
21-30 mm	4-9	9061	44.96%	(0.76%)	59.00%	-	14.04%
21-30 mm	>9	3058	53.61%	(1.47%)	77.00%	-	23.40%
31-50 mm	0	23817	20.01%	(0.37%)	30.00%	-	9.99%
31-50 mm	1-3	16807	34.91%	(0.56%)	42.00%	-	7.09%
31-50 mm	4-9	9779	53.86%	(0.73%)	59.00%	-	5.14%
31-50 mm	>9	3974	61.98%	(1.28%)	77.00%	-	15.02%
>50 mm	0	6920	22.82%	(0.73%)	34.00%	-	11.18%
>50 mm	1-3	6464	43.32%	(0.98%)	54.00%	-	10.68%
>50 mm	4-9	6208	62.91%	(0.92%)	73.00%	-	10.09%
>50 mm	>9	3470	69.15%	(1.32%)	88.00%	-	18.85%
<i>Mean (std. dev.)</i>							11.41% (5.76%)
<i>Mean weighted by N (std. dev.)</i>							6.60% (6.77%)
<i>Root Mean Square (std. dev.)</i>							12.71% (11.77%)
<i>Root Mean Square weighted by N (std. dev.)</i>							9.34% (12.61%)

¹ This analysis was performed on the SEER dataset in its entirety, including patients with tumor sizes between 50-100 mm and 8-10 positive lymph nodes. The total number of patients is 508,861.



Permutations of 5 mm tumor size bins and number of positive lymph nodes on Adjuvant!Online
Using the SEER dataset²

Group†		N	L empirical (SEM)		L predicted (SEM)		Difference (pred – emp)
Size	Nodes						
0-4 mm	0	7817	4.19%	(0.44%)	4.00%	(0.00%)	-0.19%
0-4 mm	1	435	19.85%	(4.48%)	24.00%	(0.00%)	4.15%
0-4 mm	2	132	15.87%	(5.19%)	24.00%	(0.00%)	8.13%
0-4 mm	3	70	15.83%	(6.42%)	24.00%	(0.00%)	8.17%
5-9 mm	0	41351	4.24%	(0.17%)	4.00%	(0.00%)	-0.24%
5-9 mm	1	3049	9.79%	(0.96%)	24.00%	(0.00%)	14.21%
5-9 mm	2	1041	12.87%	(1.63%)	24.00%	(0.00%)	11.13%
5-9 mm	3	401	14.49%	(2.71%)	24.00%	(0.00%)	9.51%
5-9 mm	4	232	22.04%	(3.74%)	45.00%	(0.00%)	22.96%
5-9 mm	5	151	30.75%	(5.97%)	45.00%	(0.00%)	14.25%
5-9 mm	6	107	35.69%	(6.13%)	45.00%	(0.00%)	-3.38%
5-9 mm	8	89	48.38%	(6.37%)	45.00%	(0.00%)	9.31%
10-14 mm	0	59602	7.42%	(0.17%)	10.00%	(3.06%)	2.58%
10-14 mm	1	8407	14.97%	(0.64%)	24.00%	(0.00%)	9.03%
10-14 mm	2	3318	17.88%	(0.98%)	24.00%	(0.00%)	6.12%
10-14 mm	3	1560	23.58%	(1.53%)	24.00%	(0.00%)	0.42%
10-14 mm	4	903	26.23%	(1.99%)	45.00%	(0.00%)	18.77%
10-14 mm	5	581	31.23%	(2.28%)	45.00%	(0.00%)	-10.28%
10-14 mm	6	400	34.73%	(2.63%)	45.00%	(0.00%)	13.77%
10-14 mm	7	294	45.24%	(3.18%)	45.00%	(0.00%)	10.28%
10-14 mm	8	614	55.28%	(3.78%)	45.00%	(0.00%)	-0.24%
10-14 mm	9	142	47.65%	(6.27%)	68.00%	(0.00%)	31.46%
10-14 mm	10	107	36.54%	(7.27%)	45.00%	(0.00%)	-2.65%
15-19 mm	0	42021	8.25%	(0.22%)	10.00%	(0.00%)	1.75%
15-19 mm	1	8453	13.91%	(0.70%)	24.00%	(0.00%)	10.09%
15-19 mm	2	3665	17.76%	(1.12%)	24.00%	(0.00%)	6.24%
15-19 mm	3	1815	22.52%	(1.69%)	24.00%	(0.00%)	1.49%
15-19 mm	4	1084	24.20%	(2.14%)	45.00%	(0.00%)	20.80%
15-19 mm	5	700	31.89%	(2.94%)	45.00%	(0.00%)	13.11%
15-19 mm	6	522	34.33%	(3.56%)	45.00%	(0.00%)	10.68%
15-19 mm	7	388	30.91%	(4.01%)	45.00%	(0.00%)	14.09%
15-19 mm	8	298	48.86%	(4.61%)	45.00%	(0.00%)	-3.86%
20-24 mm	0	32839	14.26%	(0.28%)	23.00%	(6.63%)	8.75%
20-24 mm	1	8227	22.83%	(0.73%)	42.00%	(9.18%)	19.17%
20-24 mm	2	4210	25.75%	(1.00%)	42.00%	(9.18%)	16.25%
20-24 mm	3	2533	31.54%	(1.35%)	42.00%	(9.18%)	10.46%
20-24 mm	4	1553	37.55%	(1.64%)	59.00%	(7.14%)	-3.65%
20-24 mm	5	1134	39.04%	(1.79%)	59.00%	(7.14%)	21.45%
20-24 mm	6	832	38.45%	(2.07%)	59.00%	(7.14%)	19.96%
20-24 mm	7	617	49.43%	(2.33%)	59.00%	(7.14%)	20.55%
20-24 mm	8	1230	62.65%	(3.01%)	59.00%	(7.14%)	9.57%
20-24 mm	9	390	48.95%	(3.83%)	59.00%	(7.14%)	10.05%
25-29 mm	0	14749	13.64%	(0.45%)	23.00%	(0.00%)	9.36%
25-29 mm	1	4391	22.20%	(1.11%)	42.00%	(0.00%)	19.81%
25-29 mm	2	2449	27.69%	(1.54%)	42.00%	(0.00%)	14.31%
25-29 mm	3	1500	33.55%	(2.17%)	42.00%	(0.00%)	8.45%
25-29 mm	4	1027	35.62%	(2.39%)	59.00%	(0.00%)	23.38%

² This analysis was performed on the SEER dataset in its entirety, including patients with tumor sizes between 50-100 mm and 8-10 positive lymph nodes. The total number of patients is 508,861.

25-29 mm	5	726	35.58%	(2.81%)	59.00%	(0.00%)	23.42%
25-29 mm	6	555	43.94%	(3.91%)	59.00%	(0.00%)	15.06%
25-29 mm	7	396	46.18%	(4.01%)	59.00%	(0.00%)	12.82%
25-29 mm	8	317	51.53%	(4.67%)	59.00%	(0.00%)	2.76%
25-29 mm	9	284	56.24%	(4.90%)	59.00%	(0.00%)	7.47%
30-34 mm	0	12446	19.88%	(0.50%)	30.00%	(3.57%)	10.12%
30-34 mm	1	4059	31.67%	(1.07%)	42.00%	(0.00%)	10.33%
30-34 mm	2	2381	34.68%	(1.39%)	42.00%	(0.00%)	7.32%
30-34 mm	3	1541	37.88%	(1.74%)	42.00%	(0.00%)	4.12%
30-34 mm	4	1042	42.87%	(1.77%)	59.00%	(0.00%)	-9.15%
30-34 mm	5	836	49.78%	(2.16%)	59.00%	(0.00%)	16.13%
30-34 mm	6	618	48.92%	(2.55%)	59.00%	(0.00%)	9.22%
30-34 mm	7	540	49.15%	(2.89%)	59.00%	(0.00%)	10.08%
30-34 mm	8	1015	68.15%	(3.08%)	59.00%	(0.00%)	9.85%
30-34 mm	9	276	57.60%	(4.68%)	59.00%	(0.00%)	1.40%
30-34 mm	10	205	54.58%	(6.21%)	77.00%	(0.00%)	22.42%
35-39 mm	0	4545	18.13%	(0.91%)	30.00%	(0.00%)	11.87%
35-39 mm	1	1662	29.77%	(1.90%)	42.00%	(0.00%)	12.23%
35-39 mm	2	1051	32.31%	(2.56%)	42.00%	(0.00%)	9.69%
35-39 mm	3	735	35.60%	(3.17%)	42.00%	(0.00%)	6.41%
35-39 mm	4	484	37.70%	(3.61%)	59.00%	(0.00%)	21.30%
35-39 mm	5	336	41.23%	(4.15%)	59.00%	(0.00%)	17.77%
35-39 mm	6	292	59.89%	(5.22%)	59.00%	(0.00%)	-0.89%
35-39 mm	7	215	52.55%	(5.83%)	59.00%	(0.00%)	6.46%
35-39 mm	10	164	53.17%	(7.25%)	77.00%	(0.00%)	23.83%
40-44 mm	0	5146	22.30%	(0.79%)	30.00%	(0.00%)	7.70%
40-44 mm	1	1870	34.66%	(1.62%)	42.00%	(0.00%)	7.35%
40-44 mm	2	1151	39.96%	(2.10%)	42.00%	(0.00%)	2.04%
40-44 mm	3	899	44.57%	(2.12%)	59.00%	(0.00%)	-7.56%
40-44 mm	4	659	48.89%	(2.40%)	42.00%	(0.00%)	-2.57%
40-44 mm	5	487	50.58%	(2.88%)	59.00%	(0.00%)	10.11%
40-44 mm	6	383	52.72%	(3.04%)	59.00%	(0.00%)	8.42%
40-44 mm	7	320	58.06%	(3.54%)	59.00%	(0.00%)	6.28%
40-44 mm	8	728	66.56%	(3.91%)	59.00%	(0.00%)	0.94%
40-44 mm	9	232	66.01%	(5.19%)	59.00%	(0.00%)	-7.01%
40-44 mm	10	158	52.58%	(7.01%)	77.00%	(0.00%)	24.43%
45-49 mm	0	1680	15.34%	(1.38%)	30.00%	(0.00%)	14.66%
45-49 mm	1	640	33.34%	(3.06%)	42.00%	(0.00%)	8.66%
45-49 mm	2	478	35.46%	(3.67%)	42.00%	(0.00%)	6.54%
45-49 mm	3	340	42.88%	(5.46%)	42.00%	(0.00%)	-0.88%
45-49 mm	6	143	56.37%	(6.43%)	59.00%	(0.00%)	2.63%
45-49 mm	10	103	47.94%	(8.07%)	77.00%	(0.00%)	29.06%
50-54 mm	0	2144	22.45%	(1.39%)	34.00%	(2.04%)	11.55%
50-54 mm	1	851	33.20%	(2.89%)	54.00%	(6.12%)	20.80%
50-54 mm	2	600	39.05%	(3.24%)	54.00%	(6.12%)	14.95%
50-54 mm	4	335	48.51%	(4.46%)	73.00%	(7.14%)	24.49%
50-54 mm	5	280	45.03%	(5.11%)	73.00%	(7.14%)	27.97%
50-54 mm	6	254	58.41%	(5.83%)	73.00%	(7.14%)	17.30%
50-54 mm	7	187	59.70%	(6.04%)	88.00%	(5.61%)	34.51%
50-54 mm	8	162	55.70%	(6.04%)	73.00%	(7.14%)	14.59%
50-54 mm	9	135	58.74%	(6.90%)	73.00%	(7.14%)	13.30%
50-54 mm	10	120	53.50%	(7.53%)	73.00%	(7.14%)	14.26%
55-59 mm	0	661	19.03%	(2.58%)	34.00%	(0.00%)	14.97%
55-59 mm	1	297	32.05%	(4.88%)	54.00%	(0.00%)	21.95%
55-59 mm	6	90	45.84%	(9.28%)	73.00%	(0.00%)	27.16%
55-59 mm	7	76	49.15%	(9.29%)	73.00%	(0.00%)	23.85%
60-64 mm	0	2185	26.23%	(1.17%)	34.00%	(0.00%)	7.77%

60-64 mm	1	903	44.51%	(1.39%)	73.00%	(0.00%)	-7.32%
60-64 mm	2	675	50.20%	(2.18%)	54.00%	(0.00%)	9.49%
60-64 mm	3	463	52.05%	(2.58%)	54.00%	(0.00%)	3.80%
60-64 mm	4	441	55.71%	(3.03%)	73.00%	(0.00%)	17.29%
60-64 mm	5	342	60.41%	(3.05%)	54.00%	(0.00%)	1.95%
60-64 mm	6	284	67.43%	(3.63%)	73.00%	(0.00%)	12.59%
60-64 mm	7	272	63.44%	(3.64%)	73.00%	(0.00%)	5.57%
60-64 mm	8	1076	80.32%	(3.65%)	73.00%	(0.00%)	9.56%
60-64 mm	9	152	73.28%	(5.19%)	73.00%	(0.00%)	-0.28%
65-69 mm	0	315	14.33%	(3.38%)	34.00%	(0.00%)	19.67%
65-69 mm	2	104	51.44%	(8.89%)	54.00%	(0.00%)	2.56%
70-74 mm	0	575	18.88%	(2.62%)	34.00%	(0.00%)	15.12%
70-74 mm	1	256	29.89%	(4.46%)	54.00%	(0.00%)	24.11%
70-74 mm	2	183	31.89%	(5.45%)	54.00%	(0.00%)	22.11%
70-74 mm	3	145	49.40%	(7.07%)	54.00%	(0.00%)	4.61%
70-74 mm	6	94	54.87%	(8.49%)	73.00%	(0.00%)	18.13%
75-79 mm	0	186	18.18%	(4.24%)	34.00%	(0.00%)	15.82%
80-84 mm	0	460	18.95%	(3.13%)	34.00%	(0.00%)	15.06%
80-84 mm	2	128	39.33%	(7.31%)	54.00%	(0.00%)	14.67%
80-84 mm	5	86	59.75%	(8.89%)	73.00%	(0.00%)	13.25%
80-84 mm	6	74	44.72%	(8.99%)	73.00%	(0.00%)	28.28%
80-84 mm	7	69	61.03%	(9.45%)	73.00%	(0.00%)	11.97%
90-94 mm	0	222	20.54%	(4.77%)	34.00%	(0.00%)	13.46%

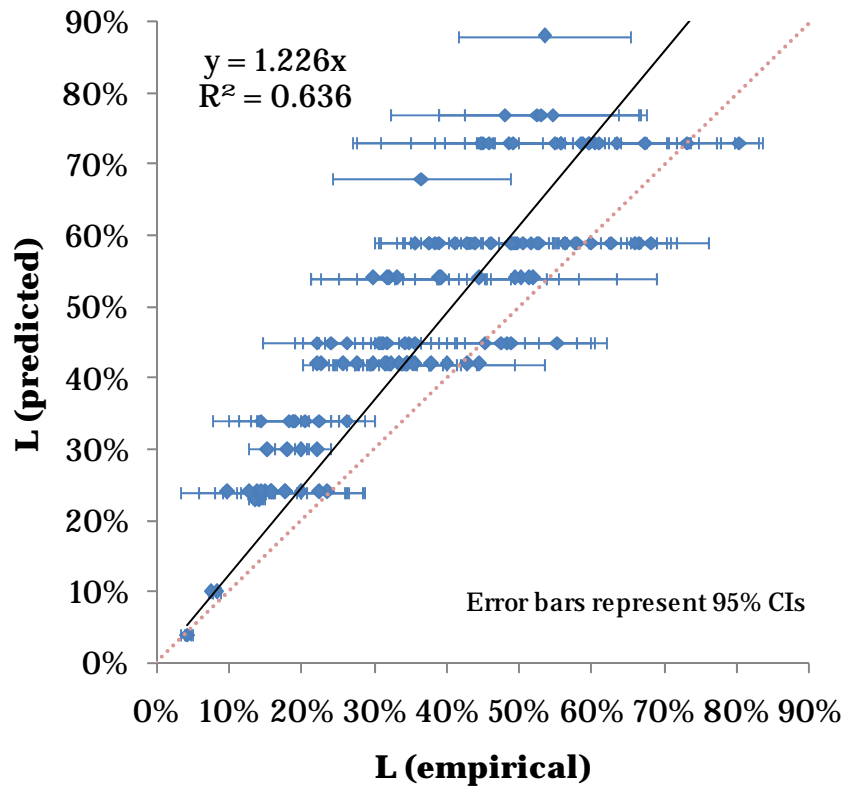
Mean (std. dev.) 10.97% (9.01%)

Mean weighted by N (std. dev.) 6.31% (14.34%)

Root Mean Square (std. dev.) 14.17% (15.09%)

Root Mean Square weighted by N (std. dev.) 15.61% (34.27%)

†all other groups are not included in the calculation of the mean or displayed on graph; 95% CI is greater than 20% or there is insufficient follow-up data for the group

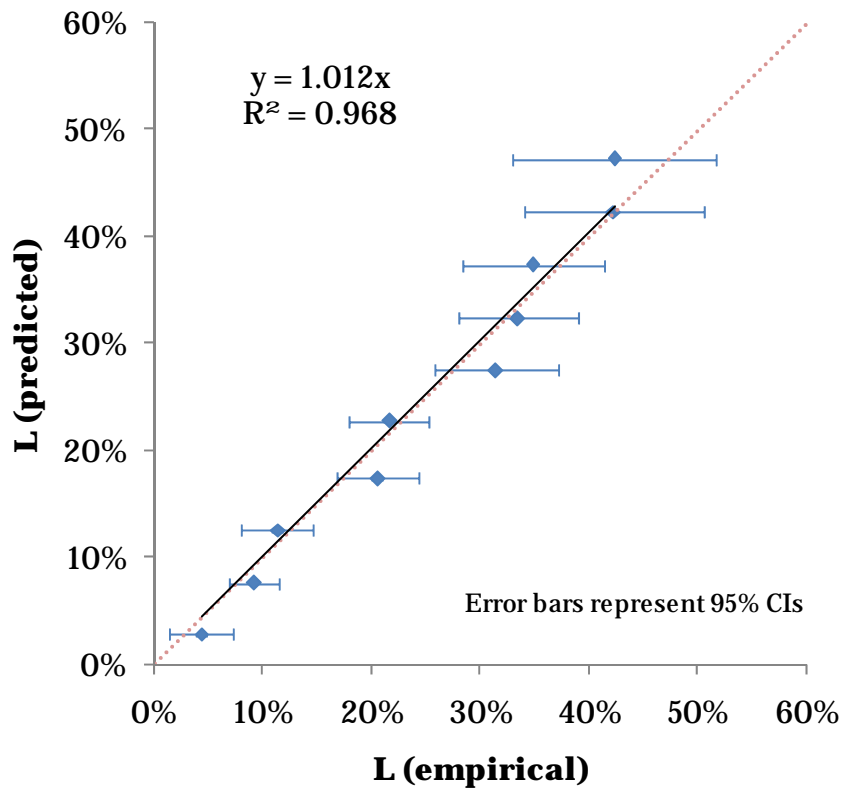


IV. Size+Nodes+PrognosticFactors

Grouped by 5% predicted (by Size+Nodes+PrognosticFactors) lethality bins
Using the Partners dataset

Group†	N	L empirical (SEM)	L predicted (SEM)	Difference (pred – emp)
0-5%	1139	4.31% (1.51%)	2.82% (0.04%)	-1.49%
6-10%	1646	9.19% (1.16%)	7.56% (0.03%)	-1.63%
11-15%	1088	11.33% (1.69%)	12.58% (0.05%)	1.25%
16-20%	1014	20.53% (1.91%)	17.37% (0.04%)	-3.16%
21-25%	849	21.61% (1.88%)	22.79% (0.05%)	1.18%
26-30%	565	31.40% (2.90%)	27.49% (0.06%)	-3.92%
31-35%	544	33.42% (2.82%)	32.35% (0.06%)	-1.07%
36-40%	386	34.81% (3.32%)	37.36% (0.08%)	2.55%
41-45%	257	42.23% (4.19%)	42.34% (0.09%)	0.12%
46-50%	181	42.29% (4.75%)	47.26% (0.09%)	4.97%
<i>Mean (std. dev.)</i>				-0.12% (2.70%)
<i>Mean weighted by N (std. dev.)</i>				-0.80% (2.24%)
<i>Root Mean Square (std. dev.)</i>				2.56% (2.83%)
<i>Root Mean Square weighted by N (std. dev.)</i>				2.27% (2.41%)

†all other groups are not included in the calculation of the mean or displayed on graph; 95% CI is greater than 20% or there is insufficient follow-up data for the group



Permutations of 10 mm tumor size bins and number of positive lymph nodes
Using the SEER dataset

Group† Size	Nodes	N	L empirical (SEM)	L predicted (SEM)	Difference (pred – emp)
1-10 mm	0	70435	6.77% (0.19%)	5.30% (0.01%)	-1.48%
11-20 mm	0	115491	13.33% (0.17%)	11.61% (0.01%)	-1.72%
21-30 mm	0	51410	21.24% (0.27%)	19.98% (0.03%)	-1.26%
31-40 mm	0	18375	26.62% (0.45%)	27.74% (0.05%)	1.12%
41-50 mm	0	7833	28.03% (0.69%)	33.95% (0.10%)	5.92%
1-10 mm	1	5482	12.14% (0.95%)	12.67% (0.03%)	0.53%
11-20 mm	1	19148	20.12% (0.63%)	18.28% (0.03%)	-1.84%
21-30 mm	1	12198	31.52% (0.82%)	25.69% (0.05%)	-5.84%
31-40 mm	1	4997	38.34% (1.15%)	32.91% (0.10%)	-5.42%
41-50 mm	1	2177	43.63% (1.80%)	38.88% (0.18%)	-4.74%
1-10 mm	2	1806	19.64% (2.09%)	19.41% (0.05%)	-0.23%
11-20 mm	2	8321	25.12% (0.97%)	24.62% (0.04%)	-0.50%
21-30 mm	2	6651	35.02% (1.04%)	31.23% (0.06%)	-3.79%
31-40 mm	2	3096	41.88% (1.49%)	37.94% (0.11%)	-3.94%
41-50 mm	2	1493	49.39% (2.20%)	43.15% (0.19%)	-6.24%
1-10 mm	3	740	19.39% (2.72%)	25.41% (0.08%)	6.02%
11-20 mm	3	4188	30.86% (1.40%)	30.50% (0.06%)	-0.35%
21-30 mm	3	4143	42.47% (1.41%)	36.51% (0.07%)	-5.96%
31-40 mm	3	2157	47.38% (1.77%)	42.71% (0.12%)	-4.66%
41-50 mm	3	1091	52.85% (2.55%)	47.54% (0.21%)	-5.31%
1-10 mm	4	453	30.01% (3.91%)	31.14% (0.10%)	1.12%
11-20 mm	4	2464	33.37% (1.76%)	35.76% (0.07%)	2.39%
21-30 mm	4	2668	46.79% (1.73%)	41.22% (0.08%)	-5.57%
31-40 mm	4	1501	50.48% (2.15%)	47.13% (0.14%)	-3.35%
41-50 mm	4	848	56.40% (2.76%)	51.54% (0.22%)	-4.86%
11-20 mm	5	1623	39.39% (2.30%)	40.63% (0.08%)	1.24%
21-30 mm	5	2034	48.02% (1.96%)	45.69% (0.08%)	-2.33%
31-40 mm	5	1082	58.78% (2.48%)	50.88% (0.15%)	-7.90%
41-50 mm	5	675	58.22% (3.16%)	55.30% (0.22%)	-2.91%
11-20 mm	6	1210	39.12% (2.48%)	45.08% (0.08%)	5.95%
21-30 mm	6	1487	51.78% (2.50%)	50.01% (0.10%)	-1.77%
31-40 mm	6	850	63.31% (2.81%)	54.29% (0.15%)	-9.01%
41-50 mm	6	541	66.03% (3.76%)	58.60% (0.22%)	-7.44%
11-20 mm	7	883	45.66% (2.79%)	49.20% (0.09%)	3.54%
21-30 mm	7	1131	57.92% (2.65%)	53.69% (0.11%)	-4.23%
31-40 mm	7	705	63.84% (3.22%)	58.12% (0.17%)	-5.72%
41-50 mm	7	478	61.68% (4.09%)	61.70% (0.22%)	0.03%
<i>Mean (std. dev.)</i>					-2.18% (3.86%)
<i>Mean weighted by N (std. dev.)</i>					-1.59% (4.09%)
<i>Root Mean Square (std. dev.)</i>					4.39% (4.44%)
<i>Root Mean Square weighted by N (std. dev.)</i>					4.33% (8.36%)

†for the combinations of 1-10 mm with 5, 6, and 7 positive nodes, the groups are not included in the calculation of the mean or displayed on graph; 95% CI is greater than 20% or there is insufficient follow-up data for the group

