Supplemental Online Content

This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1. ICD-10 codes based on the Royal College of Surgeons' adaptation of the Charlson Comorbidity Index

Disease category	Weight	ICD-10
Diabetes mellitus	1	E10, E11, E12, E13, E14
Dementia	1	F00, F01, F02, F03, G30, G31, A81, F05
Cerebrovascular Disease	1	G45, G46, I60, I61, I62, I63, I64, I65, I66, I67, I68, I69
Congestive Heart Failure	1	I11, I42, I43, I50, I51
Congestive Heart Failure or Renal Disease *	1	I13
Myocardial Infarction	1	I21, I22, I23
Congestive Heart Failure or Myocardial Infarction *	1	I25
Chronic Pulmonary Disease	1	I26, I27, J40, J41, J42, J43, J44, J45, J46, J47, J60, J61, J62, J63, J64, J65, J66, J67, J68, J70
Peripheral Vascular Disease	1	I70, I71, I72, I73, I77, K55, Z95
Rheumatological Disease	1	M05, M06, M09, M32, M33, M34, M35, M36, M12, M31
Any malignancy	2	C00, C01, C02, C03, C04, C05, C06, C07, C08, C09, C10, C11, C12, C13, C14, C15, C16, C17, C18, C19, C20, C21, C22, C23, C24, C25, C26, C30, C31, C32, C33, C34, C37, C38, C39, C40, C41, C43, C45, C46, C47, C48, C49, C50, C51, C52, C53, C54, C55, C56, C57, C58, C60, C61, C62, C63, C64, C65, C66, C67, C68, C69, C70, C71, C72, C73, C74, C75, C76, C80, C81, C82, C83, C84, C85, C88, C90, C91, C92, C93, C94, C95, C96, C97
Hemiplegia or paraplegia	2	G81, G82, G83, G11
Renal Disease	2	I12, N01, N03, N05, N07, N08, N18, N19, N25, Z49, N17, Z99
Renal Disease or Liver Disease *	2	Z94
Liver Disease	3	B18, I85, K70, K71, K76, I86, I98, K72
AIDS/HIV	6	B20, B21, B22, B24
Metastatic solid tumor	6	C77, C78, C79

* Due to ICD-10 being included as 3-digit codes in the patient register, it was not possible to separate these diseases.

eTable 2. Hazard ratios of OS and BCSS for locoregional treatment and prognostic group by short (0-5 years) and long (>5 years) follow-up.
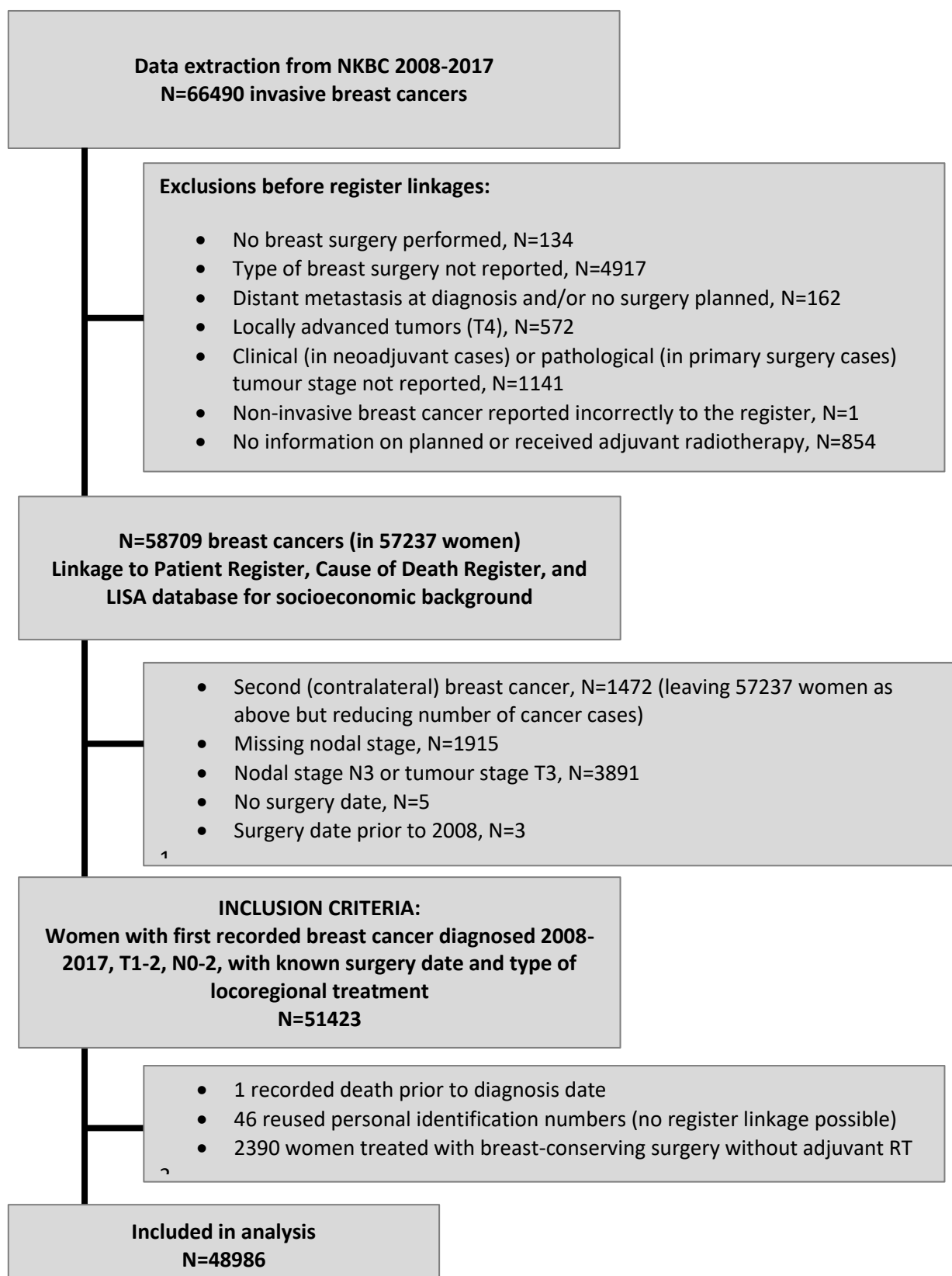
	OS 0-5 year HR (95% CI)[a]	p-value	OS >5 year HR (95% CI)[a]	p-value	BCSS 0-5 year HR (95% CI)[a]	p-value	BCSS >5 year HR (95% CI)[a]	p-value
All prognostic groups								
BCS+RT	1.00 (reference)		1.00 (reference)		1.00 (reference)		1.00 (reference)	
Mx-RT	1.83 (1.67-2.00)	<0.001	1.72 (1.55-1.92)	<0.001	1.78 (1.52-2.09)	<0.001	1.45 (1.15-1.82)	0.001
Mx+RT	1.25 (1.11-1.41)	<0.001	1.24 (1.07-1.43)	0.004	1.34 (1.13-1.60)	<0.001	1.17 (0.91-1.49)	0.224
Prognostic group:								
T1N0								
BCS+RT	1.00 (reference)		1.00 (reference)		1.00 (reference)		1.00 (reference)	
Mx-RT	1.53 (1.33-1.76)	<0.001	1.59 (1.36-1.87)	<0.001	1.55 (1.12-2.13)	0.008	1.88 (1.30-2.73)	<0.001
Mx+RT	1.37 (0.93-2.02)	0.117	1.38 (0.89-2.13)	0.146	1.54 (0.77-3.07)	0.224	2.19 (1.04-4.60)	0.039
T1N1								
BCS+RT	1.00 (reference)		1.00 (reference)		1.00 (reference)		1.00 (reference)	
Mx-RT	2.00 (1.51-2.65)	<0.001	2.04 (1.46-2.86)	<0.001	1.21 (0.68-2.17)	0.514	0.58 (0.22-1.57)	0.287
Mx+RT	1.31 (0.97-1.78)	0.078	1.64 (1.13-2.37)	0.009	1.73 (1.09-2.75)	0.021	1.08 (0.50-2.35)	0.842
T1N2								
BCS+RT	1.00 (reference)		1.00 (reference)		1.00 (reference)		1.00 (reference)	
Mx-RT	4.32 (2.22-8.42)	<0.001	2.51 (0.90-7.04)	0.08	5.77 (2.37-14.02)	<0.001	4.31 (1.19-15.56)	0.026
Mx+RT	1.30 (0.77-2.21)	0.327	1.32 (0.73-2.40)	0.358	1.62 (0.83-3.16)	0.157	0.90 (0.40-2.04)	0.809
T2N0								
BCS+RT	1.00 (reference)		1.00 (reference)		1.00 (reference)		1.00 (reference)	
Mx-RT	1.78 (1.47-2.16)	<0.001	1.58 (1.26-1.99)	<0.001	1.70 (1.26-2.29)	<0.001	1.55 (1.00-2.42)	0.051
Mx+RT	1.35 (0.93-1.96)	0.117	1.77 (1.21-2.60)	0.003	1.39 (0.80-2.40)	0.241	2.17 (1.11-4.24)	0.023
T2N1								

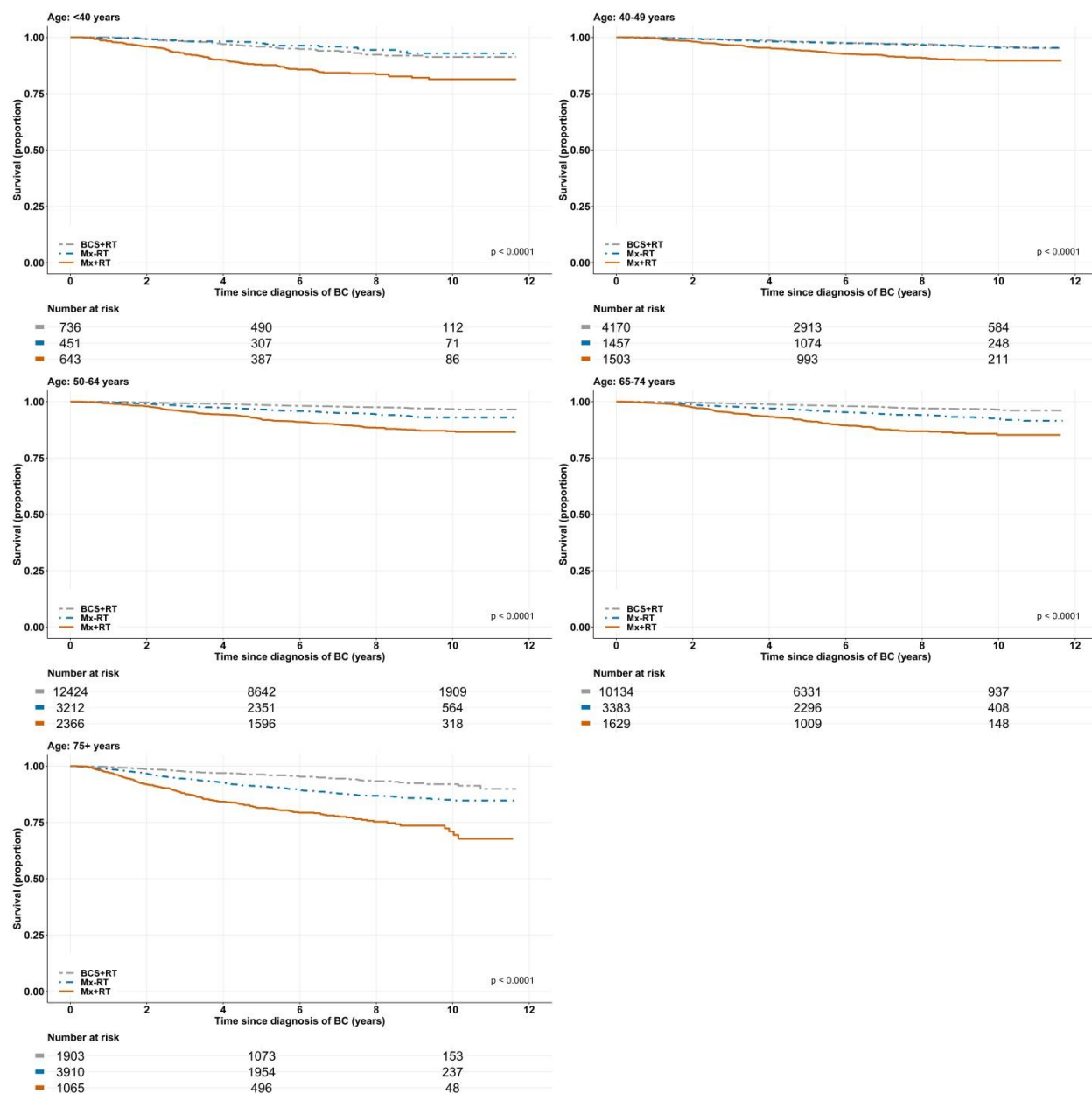|	HR (95% CI)	p-value	HR (95% CI)	p-value	HR (95% CI)	p-value	HR (95% CI)	p-value
BCS+RT	1.00 (reference)		1.00 (reference)		1.00 (reference)		1.00 (reference)	
Mx-RT	2.09 (1.63-2.69)	<0.001	2.04 (1.49-2.78)	<0.001	1.68 (1.19-2.38)	0.003	1.17 (0.67-2.05)	0.573
Mx+RT	1.23 (0.95-1.58)	0.11	1.49 (1.09-2.05)	0.013	1.10 (0.80-1.51)	0.566	1.59 (0.98-2.58)	0.061
	OS		**OS**		**BCSS**		**BCSS**	
	0-5 year		**>5 year**		**0-5 year**		**>5 year**	
	HR (95% CI)[a]	**p-value**	**HR (95% CI)[a]**	**p-value**	**HR (95% CI)[a]**	**p-value**	**HR (95% CI)[a]**	**p-value**
T2N2								
BCS+RT	1.00 (reference)		1.00 (reference)		1.00 (reference)		1.00 (reference)	
Mx-RT	3.45 (2.21-5.40)	<0.001	2.13 (1.16-3.92)	0.015	3.12 (1.80-5.41)	<0.001	0.95 (0.30-2.97)	0.931
Mx+RT	1.75 (1.17-2.59)	0.006	0.77 (0.49-1.22)	0.272	1.64 (1.04-2.59)	0.035	0.66 (0.35-1.25)	0.203

[a] Adjusted for age and calendar year at diagnosis, region, country of birth, family income, highest education, Nottingham grade, subtype, and Charlson Comorbidity Index one year prior to surgery.

OS, overall survival; BCSS, breast cancer-specific survival; BCS, breast-conserving surgery; Mx, mastectomy; RT, radiotherapy
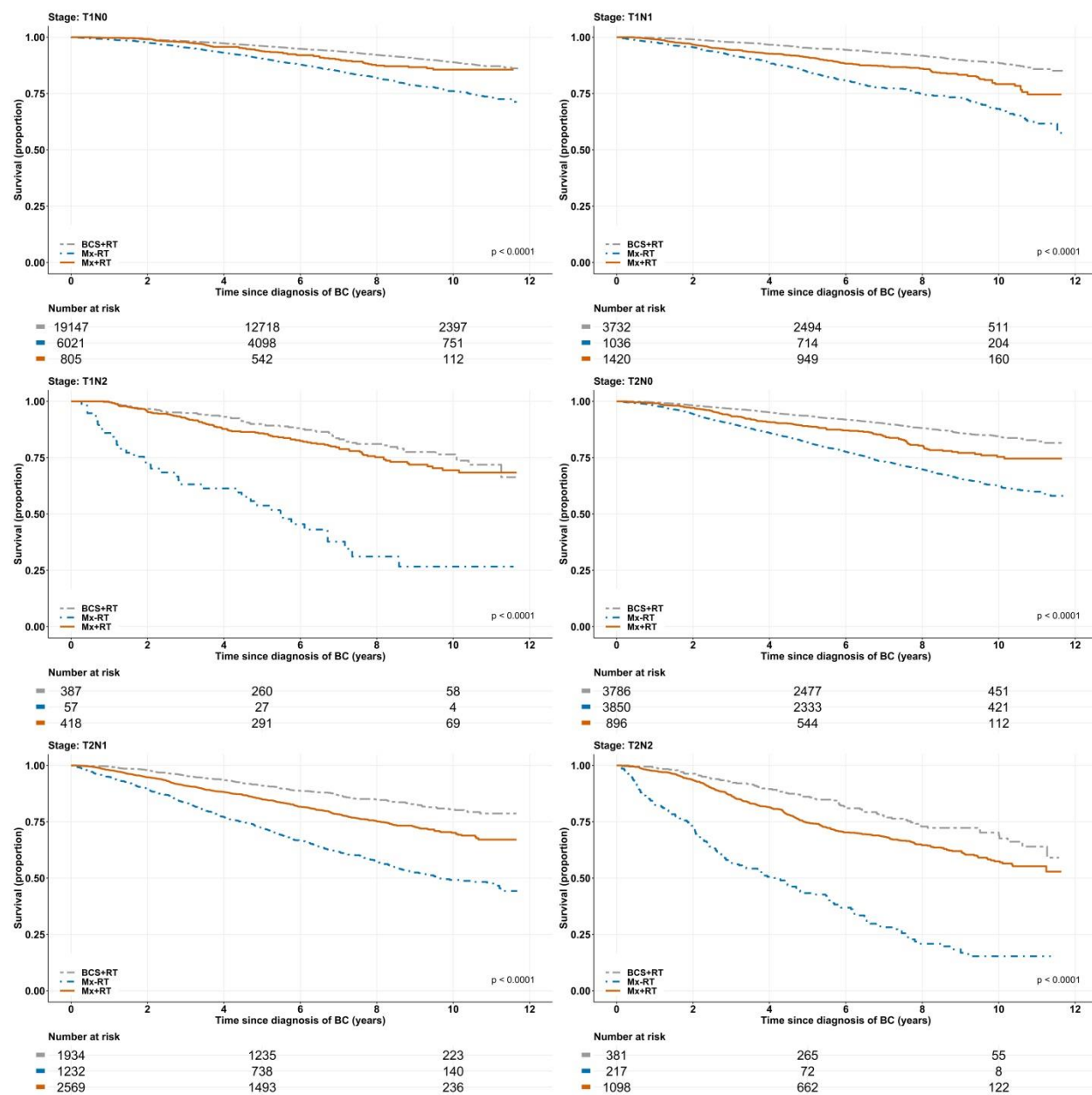
eFigure 1. CONSORT diagram for all primary breast cancer cases diagnosed in Sweden 2008-2017

Data extraction from NKBC 2008-2017
N=66490 invasive breast cancers

Exclusions before register linkages:

- No breast surgery performed, N=134
- Type of breast surgery not reported, N=4917
- Distant metastasis at diagnosis and/or no surgery planned, N=162
- Locally advanced tumors (T4), N=572
- Clinical (in neoadjuvant cases) or pathological (in primary surgery cases) tumour stage not reported, N=1141
- Non-invasive breast cancer reported incorrectly to the register, N=1
- No information on planned or received adjuvant radiotherapy, N=854

N=58709 breast cancers (in 57237 women)
Linkage to Patient Register, Cause of Death Register, and LISA database for socioeconomic background

- Second (contralateral) breast cancer, N=1472 (leaving 57237 women as above but reducing number of cancer cases)
- Missing nodal stage, N=1915
- Nodal stage N3 or tumour stage T3, N=3891
- No surgery date, N=5
- Surgery date prior to 2008, N=3

INCLUSION CRITERIA:
Women with first recorded breast cancer diagnosed 2008-2017, T1-2, N0-2, with known surgery date and type of locoregional treatment
N=51423

- 1 recorded death prior to diagnosis date
- 46 reused personal identification numbers (no register linkage possible)
- 2390 women treated with breast-conserving surgery without adjuvant RT

Included in analysis
N=48986

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eFigure 2. Survival proportions for breast cancer-specific survival by locoregional treatment group and age.

eFigure 3. Survival proportions for overall survival by locoregional treatment group and prognostic group.

eFigure 4. Survival proportions for overall survival by locoregional treatment group and age.