Supplementary Material
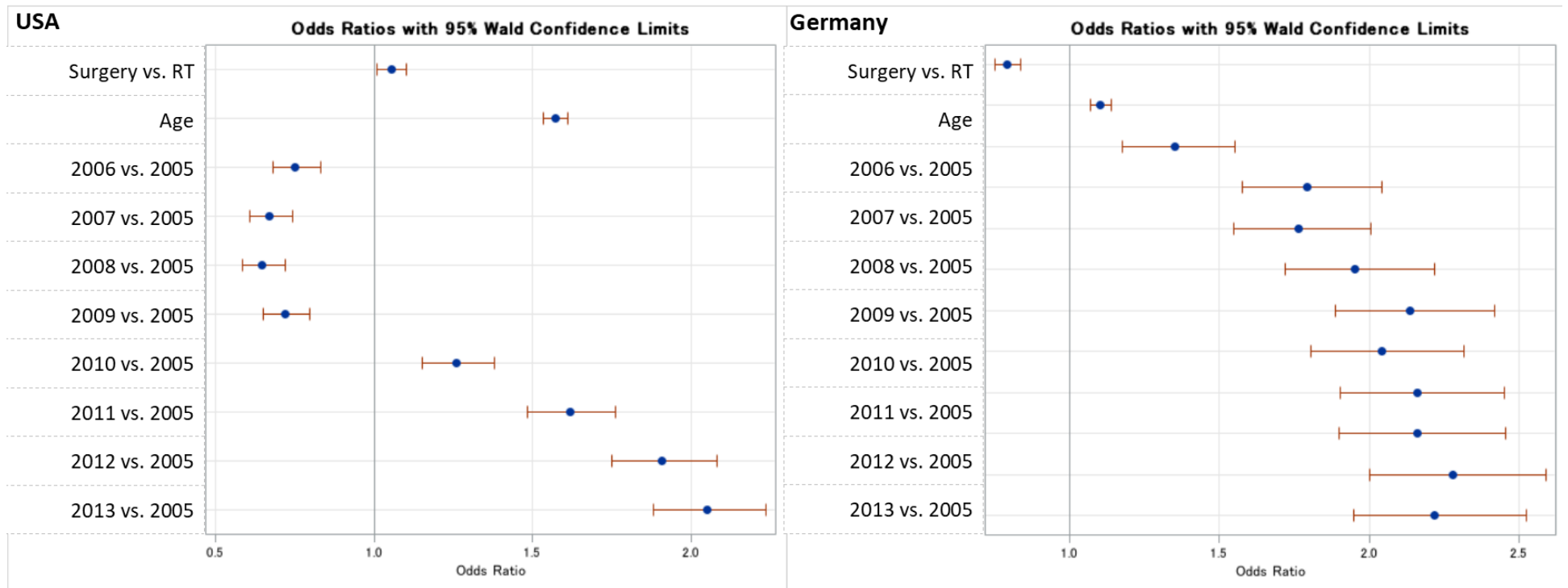
Figure S1: Pattern of missing data from multivariate logistic regression models predicting missing values.

Odds Ratio from constant hazard model

Risk Difference from matched cohort

Number of deaths/1000 person-years

Months	3	6	12	24	36
Radioth.[1]	29.1	33.7	46.2	62.8	63
Surgery[1]	192.8	109.9	81.4	72.3	59.1
HR[1]	6.6 (5.5-7.9)	1.9 (1.5-2.4)	1.1 (0.9-1.3)	0.8 (0.7-1)	0.7 (0.6-0.8)
Radioth.[2]	40	37.8	58.2	70	77.9
Surgery[2]	224.6	140.3	104.7	95.6	78.4
HR[2]	5.9 (3.3-10.5)	2.8 (1.4-5.8)	1 (0.5-1.9)	1.1 (0.6-2.0)	0.6 (0.3-1.1)

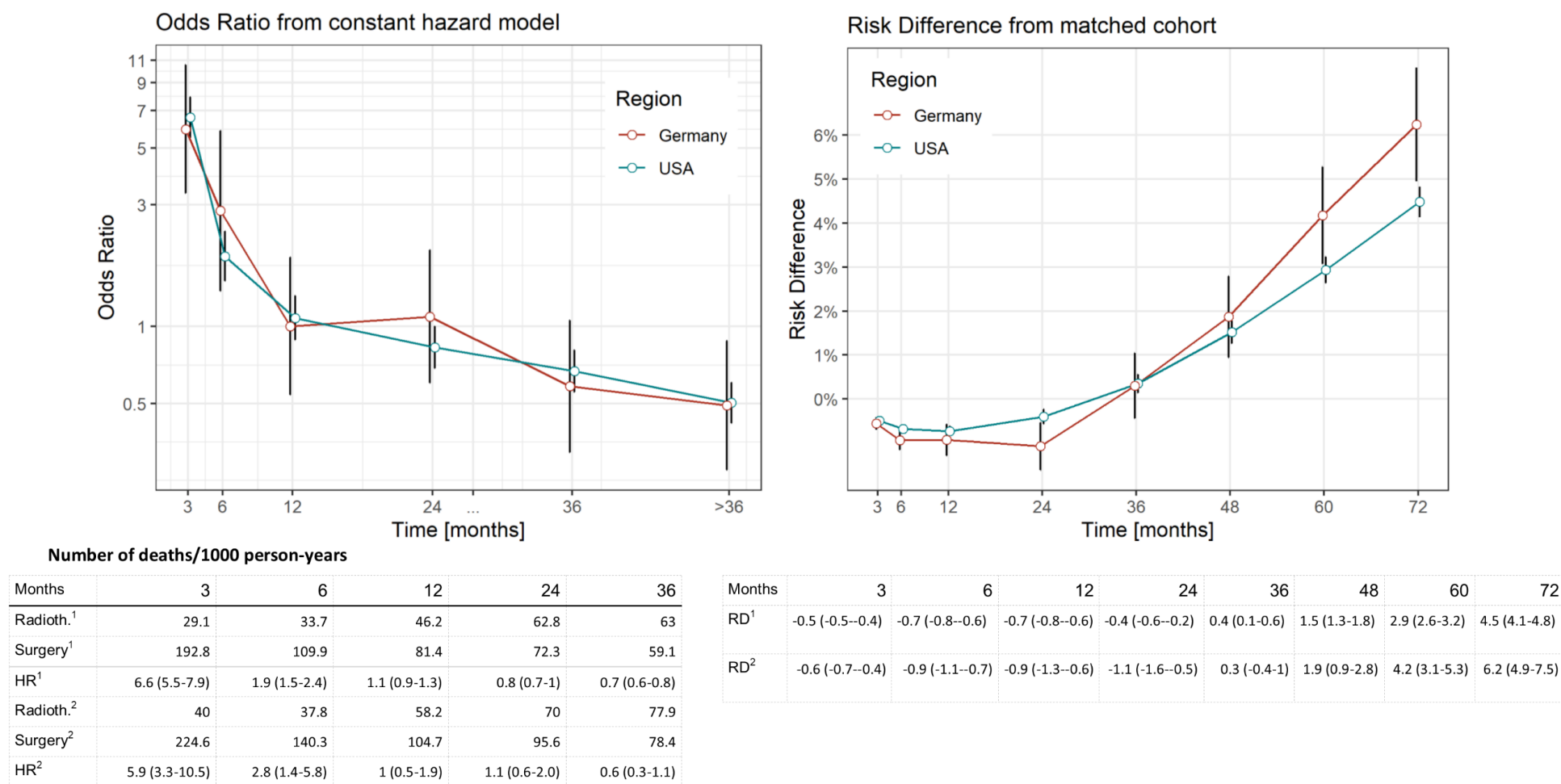| Months	3	6	12	24	36	48	60	72
RD[1]	-0.5 (-0.5--0.4)	-0.7 (-0.8--0.6)	-0.7 (-0.8--0.6)	-0.4 (-0.6--0.2)	0.4 (0.1-0.6)	1.5 (1.3-1.8)	2.9 (2.6-3.2)	4.5 (4.1-4.8)
RD[2]	-0.6 (-0.7--0.4)	-0.9 (-1.1--0.7)	-0.9 (-1.3--0.6)	-1.1 (-1.6--0.5)	0.3 (-0.4-1)	1.9 (0.9-2.8)	4.2 (3.1-5.3)	6.2 (4.9-7.5)

Figure S2: Results of univariate unadjusted analyses. A) Results from piecewise regression models and crude risk differences from Kaplan-Meier estimates. B) Kaplan-Meier plots with hazard ratios computed from Cox regression models.
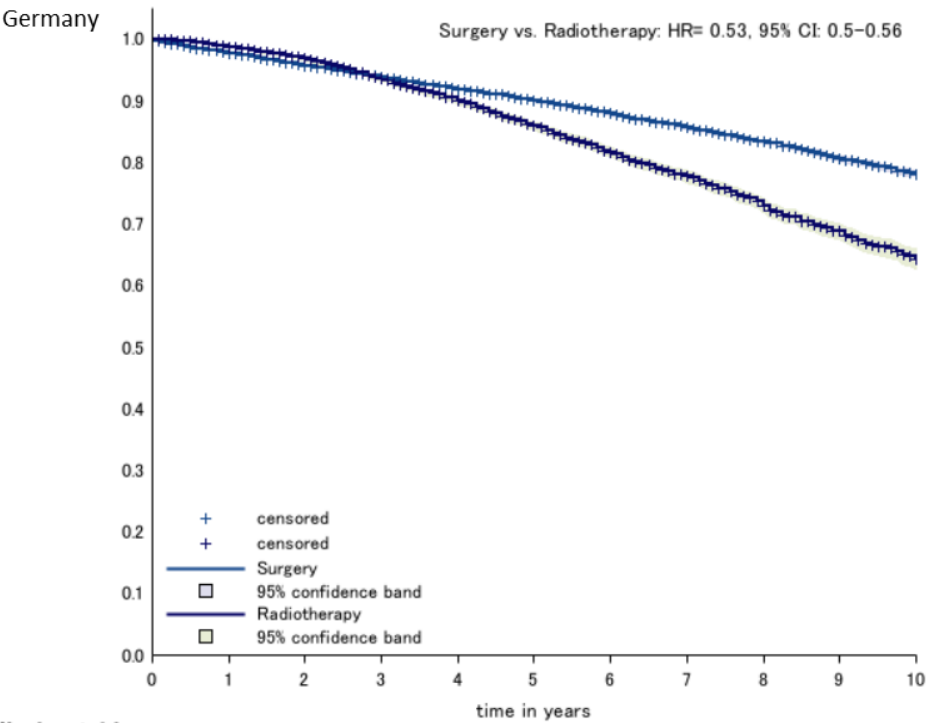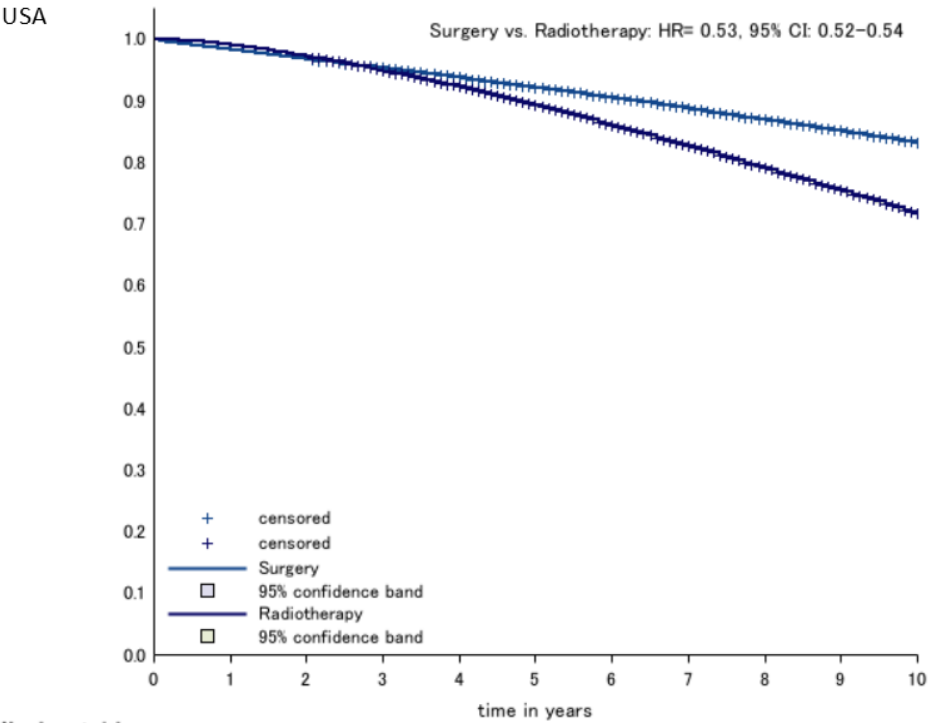
USA

Surgery vs. Radiotherapy: HR= 0.53, 95% CI: 0.52−0.54

Germany

Surgery vs. Radiotherapy: HR= 0.53, 95% CI: 0.5−0.56

+	censored
+	censored
—	Surgery
☐	95% confidence band
—	Radiotherapy
☐	95% confidence band

time in years

Number at risk

	0	1	2	3	4	5	6	7	8	9	10
Surgery	177E3	177E3	176E3	176E3	176E3	176E3	175E3	175E3	175E3	175E3	175E3
Radiotherapy	149E3	149E3	149E3	148E3	148E3	148E3	148E3	148E3	148E3	148E3	148E3

Number at risk

	0	1	2	3	4	5	6	7	8	9	10
Surgery	44146	44108	43787	43381	43018	42613	42303	41906	41535	41205	40833
Radiotherapy	10706	10706	10656	10576	10498	10418	10365	10286	10187	10079	9989

Figure S3: Sensitivity analysis of cases with low risk prostate cancer and an age below 60 at time of diagnosis.

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Odds Ratio from constant hazard model
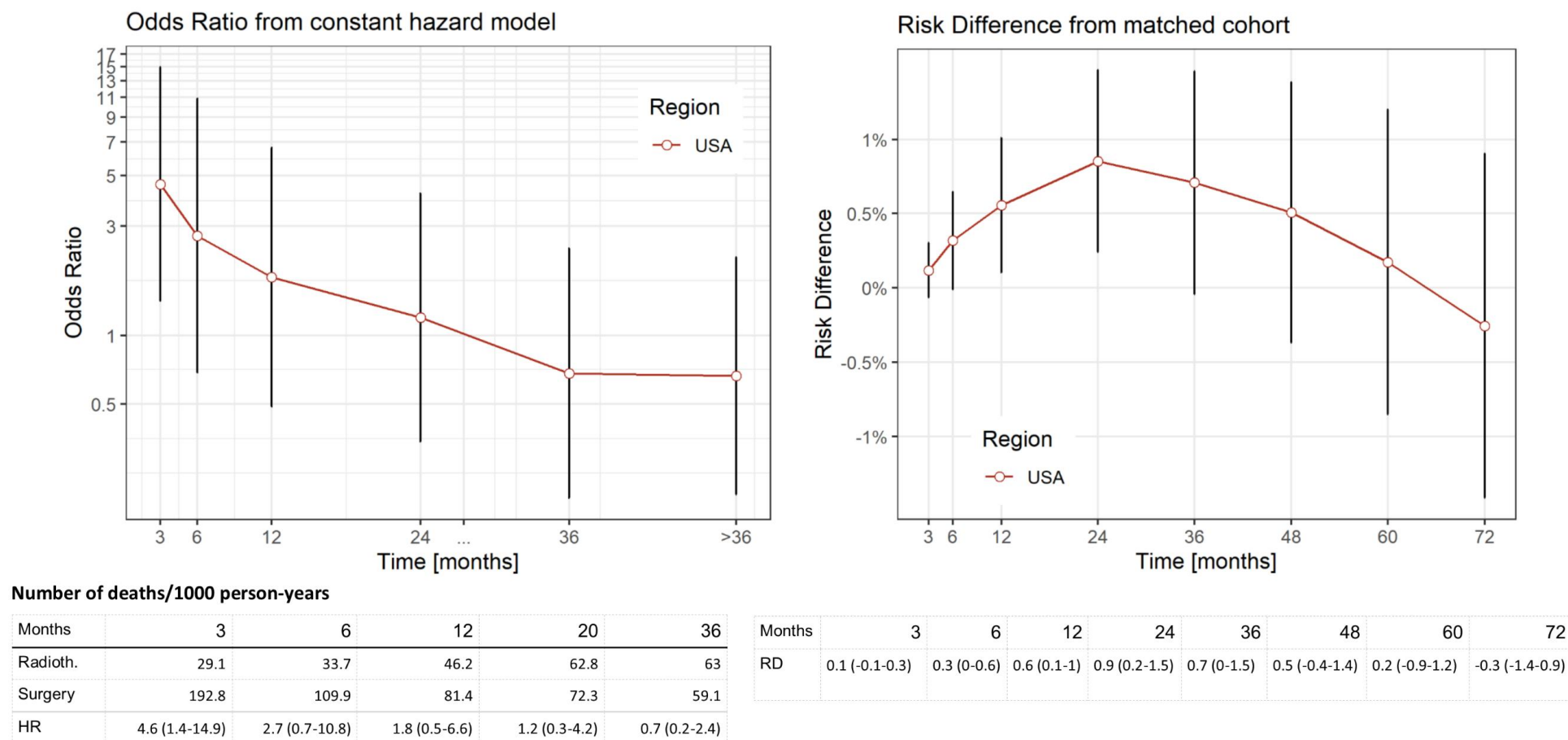

Risk Difference from matched cohort

Number of deaths/1000 person-years

Months	3	6	12	20	36
Radioth.	29.1	33.7	46.2	62.8	63
Surgery	192.8	109.9	81.4	72.3	59.1
HR	4.6 (1.4-14.9)	2.7 (0.7-10.8)	1.8 (0.5-6.6)	1.2 (0.3-4.2)	0.7 (0.2-2.4)

Months	3	6	12	24	36	48	60	72
RD	0.1 (-0.1-0.3)	0.3 (0-0.6)	0.6 (0.1-1)	0.9 (0.2-1.5)	0.7 (0-1.5)	0.5 (-0.4-1.4)	0.2 (-0.9-1.2)	-0.3 (-1.4-0.9)

Figure S4: Results from complete case models. A) Results from piecewise regression models B) Results from Cox regression models analyzing the temporal course

Table S1: Numbers of proportions of missing data.

	SEER data	Germany
Year of diagnosis	0	0
Survival time	0	0
TNM Stage	10164 (2.30%)	514 (0.72%)
Age	0	0
Grade	12261 (2.78%)	12593 (17.73%)
Treatment	9892 (2.24%)	0

Table S2: Basic characteristics after propensity score matching (complete data), * if selected by year-specific model

USA	Radiotherapy		Surgery	
	Mean [95% CI]		Mean [95% CI]	
Age	66.5 [66.5-66.6]		66.9 [66.8-70.0]	
Propensity Score	0.564 [0.562-0.566]		0.564 [0.562-0.566]	
Frequency values				
	n	%	n	%
Gleason ≤6	32399	50.5	31109	48.5
Gleason >6	31747	49.5	33037	51.5
Locally limited (T1/T2)	60249	93.9	59592	92.9
Locally advanced (T3/T4)	2907	4.5	3477	5.4
Node-positive	990	1.5	1077	1.7
Germany	Radiotherapy		Surgery	
	Mean [95% CI]		Mean [95% CI]	
Age	71.1 [71.0-71.3]		71.0 [70.9-71.2]	
Propensity Score	0.350 [0.346-0.353]		0.351 [0.347-0.355]	
Frequency values				
	n	%	n	%
Gleason ≤6	1194	75.4	1187	75.0
Gleason >6	389	25.2	395	26.1
Locally limited (T1/T2)	6906	86.9	6887	86.6
Locally advanced (T3/T4)	822	10.3	842	10.6
Node-positive	222	2.8	221	2.8