Munich Cancer Registry

Munich Cancer Registry at Munich Cancer Center
Marchioninistr. 15
Munich, 81377
Germany

http://www.tumorregister-muenchen.de/en

Cancer statistics: Survival

C33, C34: Lung cancer

Year of diagnosis	1988-2013
Patients	32,683
Diseases	32,999
Cases evaluated	16,892
Creation date	05/13/2015
Export date	12/30/2014
Population	4.64 m

C33, C34: Malignant neoplasm of lung and trachea
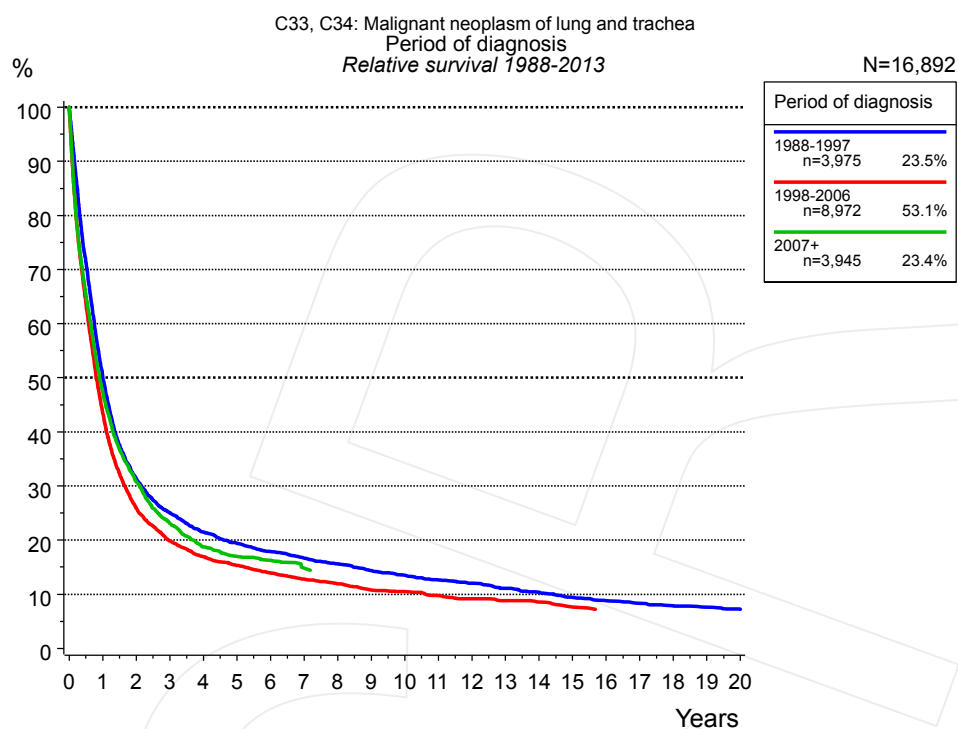Period of diagnosis
Relative survival 1988-2013

Figure 1a. Relative survival of patients with lung cancer by period of diagnosis. Included in the evaluation are 16,892 cases diagnosed between 1988 and 2013.

The presented survival curves are derived from clinical records with valid follow-up informations, which means that death certificate cases (DCO) cases are omitted from the analysis. With this one restriction, the MCR has provided population-based statistics since 1988, collecting data on all cancer cases in the region of southern Bavaria. Historical data of previous time periods can be heavily selected, therefore, univariate survival comparisons of the presented time periods must be carefully considered. Nonetheless, all calculable survival curves are depicted to facilitate the comparison of long time follow-up analyses of relative survival between particular cancers.

	Period of diagnosis					
	1988-1997 n=3,975		1998-2006 n=8,972		2007+ n=3,945	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	49.0	50.3	42.4	43.5	46.4	47.5
2	29.9	31.4	24.7	25.9	29.4	30.8
3	23.3	25.0	18.5	19.8	21.7	23.1
4	19.6	21.5	15.5	16.9	17.2	18.7
5	17.2	19.4	13.7	15.3	15.2	17.0
6	15.5	17.9	12.2	13.9	14.5	16.3
7	14.1	16.7	11.0	12.8	12.9	14.8
8	13.0	15.6	10.0	11.9		
9	11.7	14.4	8.8	10.8		
10	10.6	13.5	8.3	10.5		
11	9.7	12.6	7.6	9.7		
12	9.0	12.0	7.0	9.1		
13	8.1	11.1	6.6	8.8		
14	7.4	10.4	6.2	8.6		
15	6.5	9.4	5.4	7.6		
16	5.9	8.8				
17	5.4	8.3				
18	5.1	7.9				
19	4.7	7.6				
20	4.3	7.2				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with lung cancer by period of diagnosis for period 1988-2013 (N=16,892).

C33, C34: Malignant neoplasm of lung and trachea
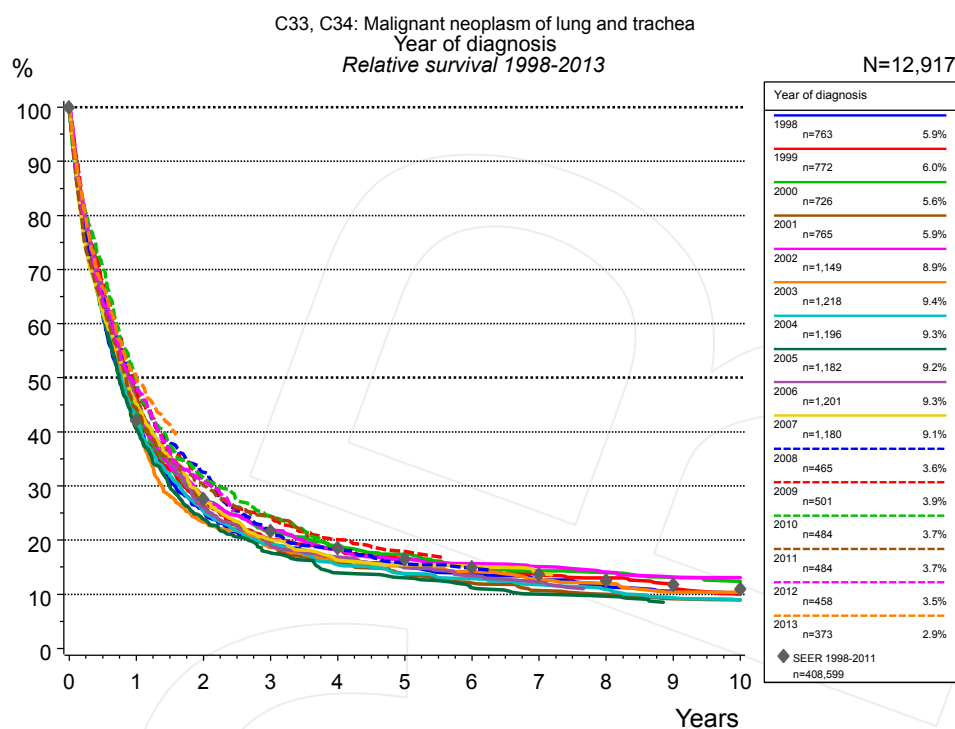Year of diagnosis
Relative survival 1998-2013

Figure 1c. Relative survival of patients with lung cancer by year of diagnosis. Included in the evaluation are 12,917 cases diagnosed between 1998 and 2013.

The survival results of the SEER program (Surveillance, Epidemiology, and End Results) of the American National Cancer Institute (NCI) are summarized as the period of diagnosis from 1998 to 2011, and are represented by gray diamonds in order to facilitate comparisons between MCR and SEER.

	Year of diagnosis													
	1998 n=763		1999 n=772		2000 n=726		2001 n=765		2002 n=1,149		2003 n=1,218		2004 n=1,196	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	41.2	42.4	43.1	44.4	42.5	43.6	46.1	47.2	44.0	45.1	40.3	41.3	41.7	42.7
2	24.3	25.5	25.9	27.3	26.3	27.6	25.4	26.5	26.5	27.8	22.3	23.3	24.2	25.3
3	18.0	19.3	18.7	20.1	20.4	21.6	18.3	19.5	20.5	21.9	17.4	18.7	18.0	19.2
4	15.2	16.7	16.5	18.2	17.4	18.9	14.8	16.0	16.6	18.2	15.0	16.3	14.4	15.5
5	13.6	15.3	14.6	16.6	15.6	17.3	12.4	13.8	14.8	16.5	13.7	15.2	12.4	13.8
6	11.8	13.6	13.3	15.5	13.6	15.4	10.6	12.0	13.7	15.7	12.5	14.2	11.4	12.9
7	10.8	12.7	11.5	13.7	12.4	14.3	9.3	10.7	13.0	15.1	11.1	12.7	10.3	11.8
8	9.3	11.4	10.7	13.1	11.9	14.0	8.6	10.0	11.9	14.1	10.1	12.0	9.2	10.9
9	8.5	10.5	8.9	11.2	10.9	13.1	7.7	9.2	11.0	13.2	8.5	10.4	7.7	9.3
10	7.8	10.1	7.9	10.1	10.0	12.4	7.5	9.0	10.7	13.1	8.5	10.4	7.3	8.9

	Year of diagnosis													
cont'd	2005 n=1,182		2006 n=1,201		2007 n=1,180		2008 n=465		2009 n=501		2010 n=484		2011 n=484	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	39.6	40.5	44.2	45.3	44.1	45.1	47.7	48.8	46.9	47.7	48.8	49.9	43.4	44.4
2	22.9	23.9	25.0	25.9	25.9	27.0	31.2	32.5	30.3	31.5	30.2	31.3	28.9	30.2
3	16.7	17.7	17.9	18.9	18.8	20.1	20.0	21.2	22.8	24.2	23.1	24.4	22.8	24.3
4	12.9	13.9	15.7	16.9	15.0	16.3	16.8	18.3	18.6	20.1	16.9	18.3		
5	11.9	13.0	13.5	14.9	13.9	15.4	14.0	15.7	16.4	17.9				
6	10.0	11.2	12.0	13.4	13.5	15.2	13.3	14.8						
7	8.8	10.0	10.8	12.2	12.1	14.0								
8	8.4	9.6												

	Year of diagnosis			
cont'd	2012 n=458		2013 n=373	
Years	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	47.6	48.5	49.1	50.2
2	29.4	30.8		

Table 1d. Observed (obs.) and relative (rel.) survival of patients with lung cancer by year of diagnosis for period 1998-2013 (N=12,917).
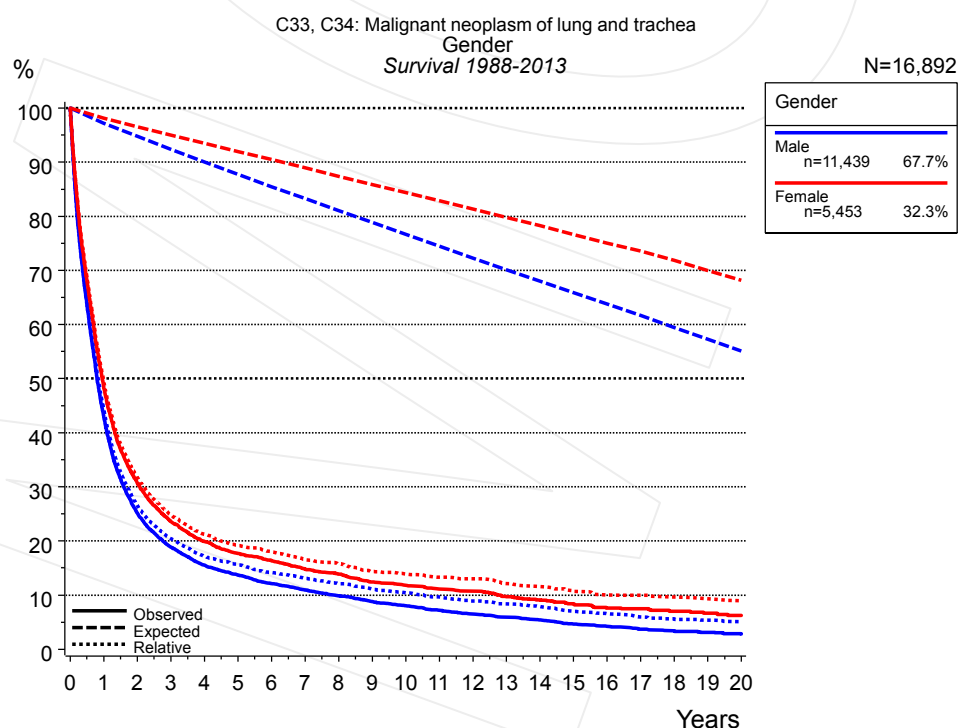

Figure 2a. Survival of patients with lung cancer by gender. Included in the evaluation are 16,892 cases diagnosed between 1988 and 2013.

Years	Gender			
	Male n=11,439		Female n=5,453	
	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0
1	43.1	44.3	48.5	49.4
2	25.1	26.5	30.7	31.8
3	18.9	20.4	23.6	24.8
4	15.5	17.2	19.8	21.2
5	13.7	15.6	17.7	19.2
6	12.1	14.2	16.3	18.0
7	10.9	13.1	14.8	16.6
8	9.9	12.2	13.8	15.8
9	8.8	11.1	12.4	14.4
10	8.0	10.4	11.8	13.9
11	7.2	9.6	11.0	13.3
12	6.5	8.9	10.7	13.0
13	5.9	8.3	9.7	12.1
14	5.4	7.9	9.1	11.6
15	4.6	7.0	8.4	10.8
16	4.2	6.5	7.6	10.1
17	3.7	6.0	7.4	10.0
18	3.4	5.6	7.0	9.7
19	3.1	5.4	6.6	9.4
20	2.8	5.1	6.2	9.0

Table 2b. Observed (obs.) and relative (rel.) survival of patients with lung cancer by gender for period 1988-2013 (N=16,892).

C33, C34: Malignant neoplasm of lung and trachea
Age category
Relative survival 1988-2013   N=16,892

Age category

0-49 yrs n=1,346 8.0%
50-59 yrs n=3,789 22.4%
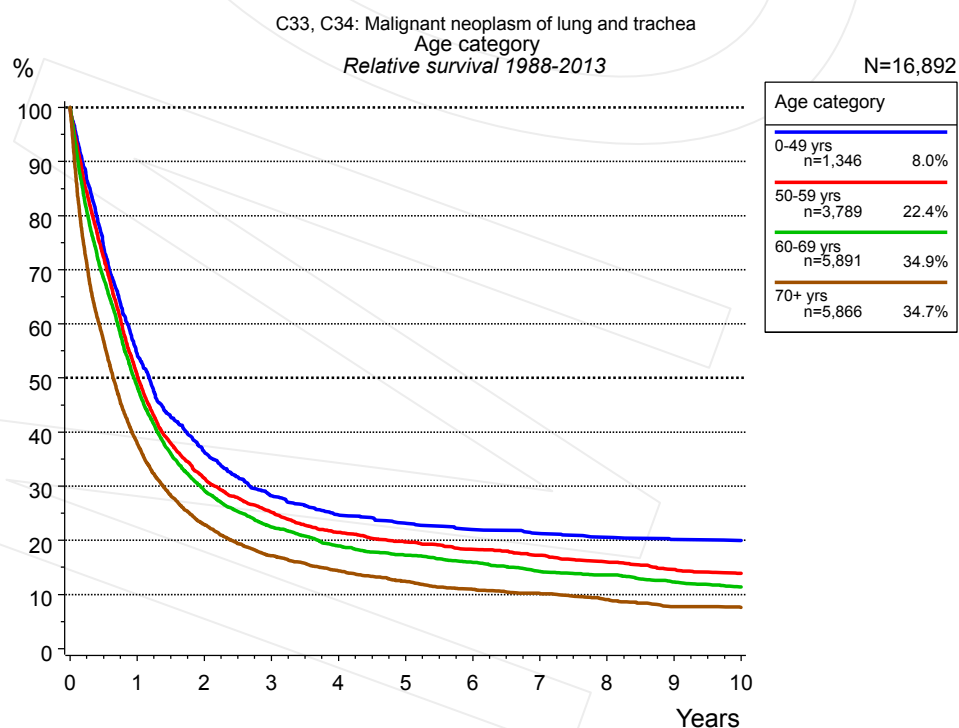60-69 yrs n=5,891 34.9%
70+ yrs n=5,866 34.7%

Figure 3a. Relative survival of patients with lung cancer by age category. Included in the evaluation are 16,892 cases diagnosed between 1988 and 2013.
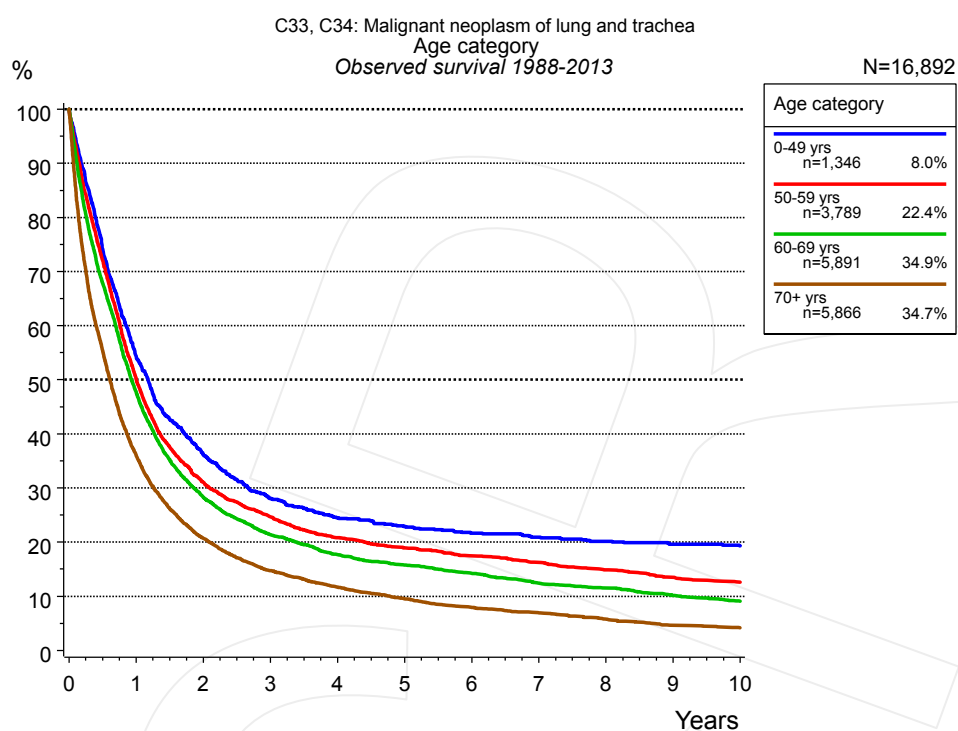
C33, C34: Malignant neoplasm of lung and trachea
Age category
Observed survival 1988-2013

N=16,892

Age category		
0-49 yrs n=1,346		8.0%
50-59 yrs n=3,789		22.4%
60-69 yrs n=5,891		34.9%
70+ yrs n=5,866		34.7%

Figure 3b. Observed survival of patients with lung cancer by age category. Included in the evaluation are 16,892 cases diagnosed between 1988 and 2013.

	Age category							
	0-49 yrs n=1,346		50-59 yrs n=3,789		60-69 yrs n=5,891		70+ yrs n=5,866	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	54.4	54.5	50.2	50.6	47.8	48.5	36.1	38.0
2	36.3	36.4	31.1	31.5	28.3	29.3	20.7	22.9
3	28.1	28.2	24.7	25.2	21.4	22.5	14.7	17.2
4	24.5	24.7	20.8	21.5	17.7	19.0	11.7	14.4
5	22.9	23.2	19.0	19.7	15.8	17.3	9.5	12.4
6	21.6	22.0	17.5	18.3	14.2	15.9	7.9	11.0
7	20.9	21.3	16.3	17.3	12.4	14.3	6.9	10.2
8	20.2	20.6	14.9	16.0	11.5	13.6	5.7	9.1
9	19.6	20.2	13.5	14.6	10.2	12.3	4.6	7.8
10	19.3	20.0	12.6	13.9	9.1	11.4	4.1	7.6

Table 3c. Observed (obs.) and relative (rel.) survival of patients with lung cancer by age category for period 1988-2013 (N=16,892).

C33, C34: Malignant neoplasm of lung and trachea
UICC
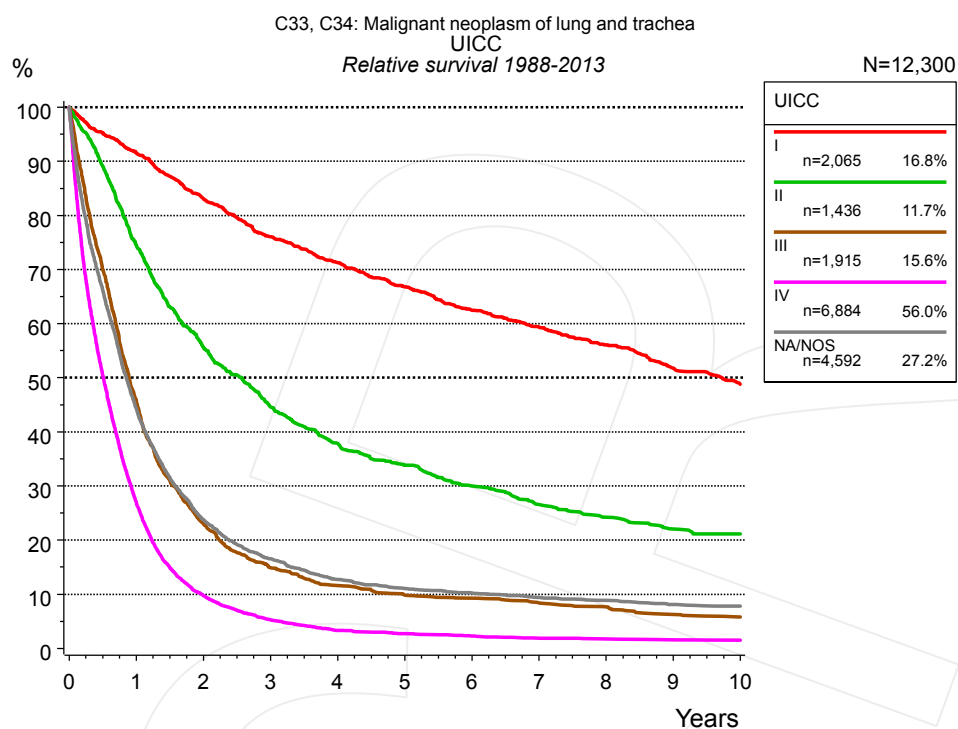*Relative survival 1988-2013*   N=12,300

Figure 4a. Relative survival of patients with lung cancer by UICC. For 14,691 of 16,892 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 12,300 cases an evaluable classification was established. The grey line represents the subgroup of 4,592 patients with missing values regarding UICC (27.2% of 16,892 patients, the percent values of all other categories are related to n=12,300).

	UICC									
	I		II		III		IV		NA/NOS	
	n=2,065		n=1,436		n=1,915		n=6,884		n=4,592	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	89.7	91.5	73.1	74.5	44.8	45.8	26.4	27.0	42.9	44.3
2	79.7	83.1	53.6	55.7	22.1	23.1	9.4	9.7	22.3	23.7
3	71.4	76.1	42.1	44.6	14.1	14.9	5.0	5.3	15.1	16.5
4	65.5	71.3	35.0	37.8	10.7	11.6	3.1	3.3	11.3	12.7
5	60.0	66.8	30.7	33.8	8.9	9.9	2.5	2.7	9.6	11.1
6	54.8	62.5	26.7	30.0	8.3	9.3	2.0	2.3	8.6	10.2
7	50.8	59.3	23.2	26.6	7.3	8.4	1.7	1.9	7.8	9.4
8	46.8	56.1	20.7	24.2	6.6	7.7	1.5	1.8	7.1	8.8
9	42.2	51.8	18.4	22.0	5.2	6.3	1.4	1.6	6.4	8.1
10	38.8	48.8	17.3	21.1	4.7	5.8	1.3	1.5	6.0	7.8

Table 4b. Observed (obs.) and relative (rel.) survival of patients with lung cancer by UICC for period 1988-2013 (N=12,300).

C33, C34: Malignant neoplasm of lung and trachea
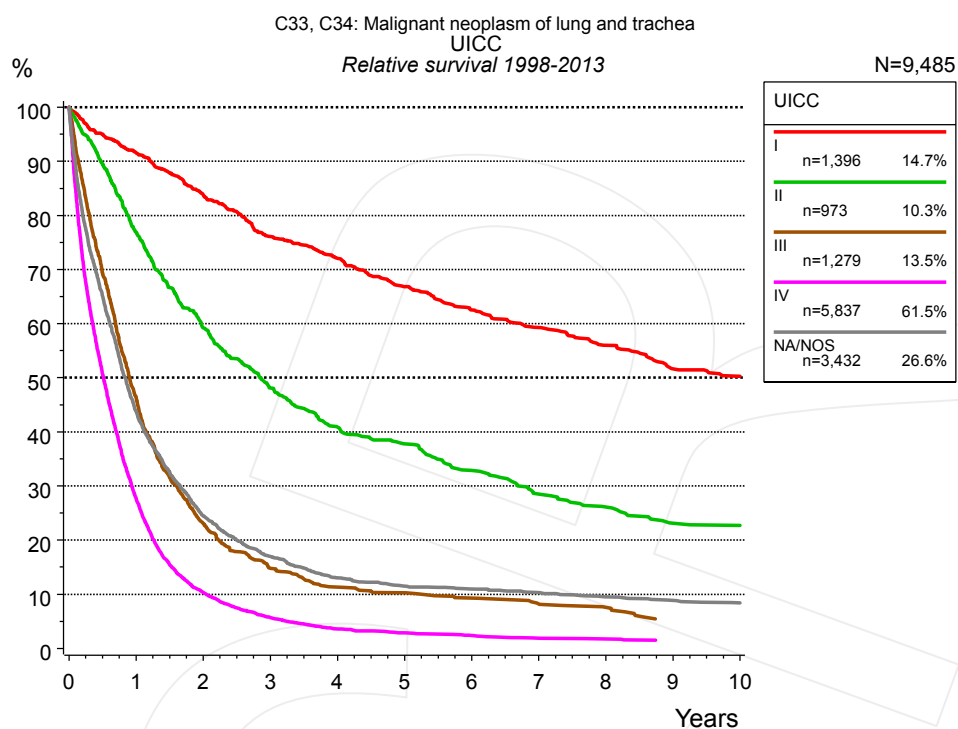UICC
Relative survival 1998-2013

Figure 4c. Relative survival of patients with lung cancer by UICC. For 11,167 of 12,917 cases diagnosed between 1998 and 2013 valid data could be obtained for this item. For a total of 9,485 cases an evaluable classification was established. The grey line represents the subgroup of 3,432 patients with missing values regarding UICC (26.6% of 12,917 patients, the percent values of all other categories are related to n=9,485).

	I n=1,396		II n=973		III n=1,279		IV n=5,837		NA/NOS n=3,432	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	89.8	91.6	75.5	76.9	45.4	46.4	27.1	27.7	42.3	43.7
2	80.5	83.8	57.0	59.2	22.2	23.1	9.9	10.3	23.1	24.5
3	71.6	76.1	45.5	48.1	14.0	14.8	5.4	5.7	15.6	17.0
4	66.3	72.1	38.0	40.9	10.5	11.3	3.4	3.6	11.6	13.0
5	60.1	66.8	34.4	37.8	9.4	10.2	2.6	2.9	10.0	11.5
6	54.9	62.5	29.3	32.9	8.3	9.3	2.1	2.4	9.3	11.0
7	51.0	59.3	25.1	28.5	7.3	8.2	1.7	1.9	8.6	10.3
8	47.0	56.0	22.5	26.1	6.5	7.6	1.5	1.7	7.7	9.5
9	42.3	51.6	19.4	23.1	4.6	5.2	1.3	1.5	7.1	8.8
10	40.2	50.3	19.0	22.7			1.3	1.4	6.5	8.4

Table 4d. Observed (obs.) and relative (rel.) survival of patients with lung cancer by UICC for period 1998-2013 (N=9,485).

C33, C34: Malignant neoplasm of lung and trachea
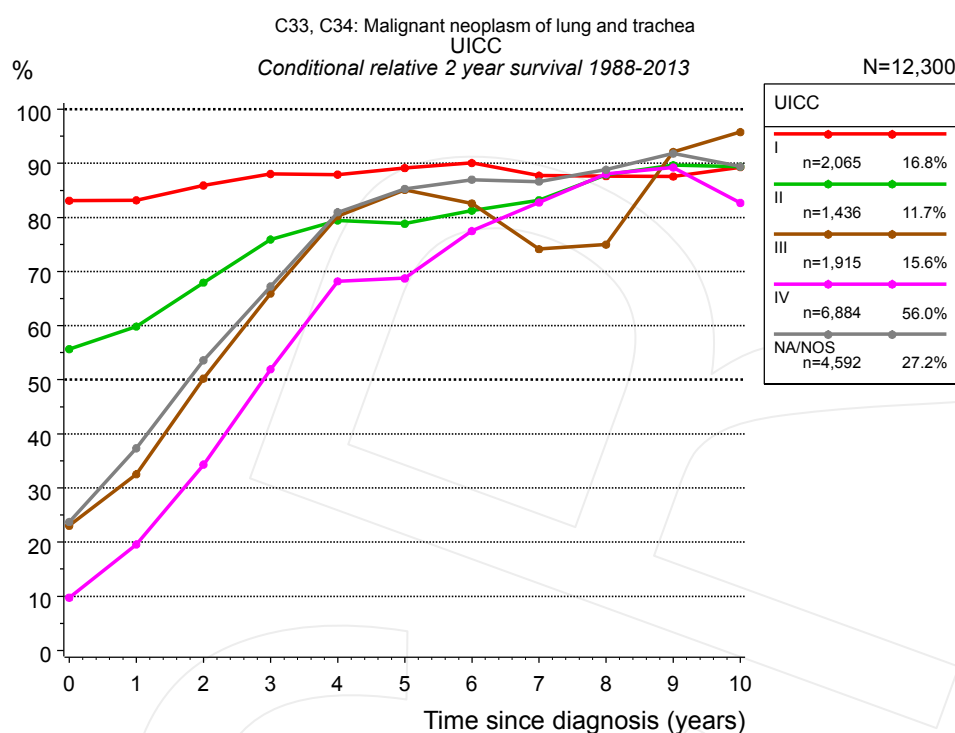UICC
Conditional relative 2 year survival 1988-2013

Figure 4e. Conditional relative 2-year survival of patients with lung cancer by UICC. For 14,691 of 16,892 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 12,300 cases an evaluable classification was established. The grey line represents the subgroup of 4,592 patients with missing values regarding UICC (27.2% of 16,892 patients, the percent values of all other categories are related to n=12,300).

	UICC									
	I		II		III		IV		NA/NOS	
		Cond. surv. %		Cond. surv. %		Cond. surv. %		Cond. surv. %		Cond. surv. %
Years	n	2 yrs	n	2 yrs	n	2 yrs	n	2 yrs	n	2 yrs
0	2,065	83.1	1,436	55.7	1,915	23.1	6,884	9.7	4,592	23.7
1	1,775	83.2	996	59.9	804	32.6	1,679	19.6	1,843	37.3
2	1,461	85.9	676	68.0	364	50.2	528	34.3	881	53.6
3	1,228	88.0	486	75.9	212	66.0	242	51.9	548	67.3
4	1,041	87.9	373	79.4	147	80.2	129	68.2	374	80.9
5	859	89.1	293	78.8	111	85.1	89	68.7	287	85.3
6	712	90.1	230	81.3	95	82.6	67	77.5	231	87.0
7	613	87.7	182	83.2	78	74.1	48	82.8	190	86.6
8	518	87.6	151	87.9	65	75.0	33	88.0	151	88.8
9	432	87.6	122	89.7	50	92.1	26	89.2	114	91.8
10	370	89.3	107	89.4	42	95.8	24	82.7	99	89.4

Table 4f. Conditional relative 2-year survival of patients with lung cancer by UICC for period 1988-2013 (N=12,300).

Conditional relative survival rates refer to the relative survival probability, in this case for 2 years after cancer diagnosis, compared to the age- and sex-matched population (=100%) under the condition of being alive for a certain time period (x-axis in Figure 4c). The results illustrate to what extent the cancer induced mortality of particular subgroups declines in the subsequent years after detection of the malignancy. For instance, according to the presented survival statistics, patients in the subgroup UICC="I", who are alive at least 3 years after cancer diagnosis, the conditional relative 2-year survival rate is 88.0% (n=1,228).
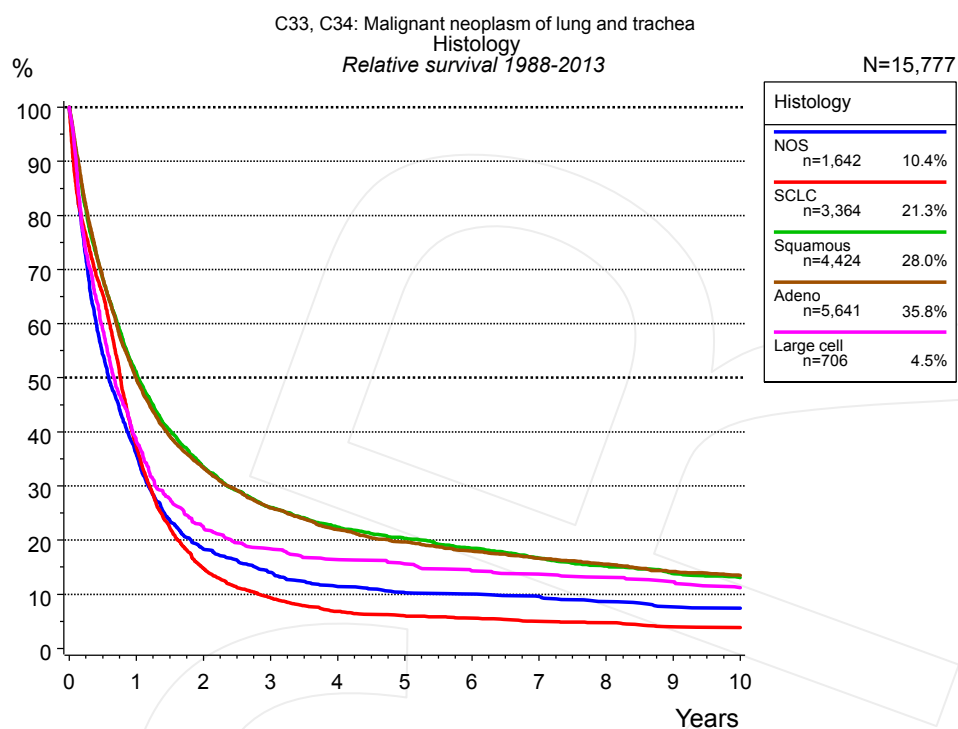
C33, C34: Malignant neoplasm of lung and trachea
Histology
Relative survival 1988-2013

Figure 4g. Relative survival of patients with lung cancer by histology. For 15,777 of 16,892 cases diagnosed between 1988 and 2013 valid data could be obtained for this item.

	Histology									
	NOS n=1,642		SCLC n=3,364		Squamous n=4,424		Adeno n=5,641		Large cell n=706	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	35.0	35.9	36.6	37.4	49.6	51.0	48.8	49.9	37.5	38.3
2	17.5	18.4	14.2	14.8	31.8	33.6	31.9	33.3	21.5	22.3
3	13.1	14.1	8.9	9.3	24.1	26.1	24.4	26.0	17.4	18.4
4	10.5	11.4	6.4	6.9	20.2	22.4	20.2	22.0	15.4	16.4
5	9.3	10.3	5.6	6.0	17.8	20.3	17.7	19.6	14.2	15.6
6	8.8	10.0	5.0	5.6	15.7	18.5	15.9	18.0	12.8	14.3
7	8.3	9.6	4.4	5.0	13.8	16.7	14.4	16.7	12.1	13.7
8	7.3	8.7	4.2	4.8	12.2	15.2	13.1	15.5	11.4	13.2
9	6.4	7.7	3.4	4.0	10.8	13.8	11.7	14.2	10.5	12.3
10	6.1	7.5	3.3	3.9	9.9	13.1	10.8	13.5	9.4	11.2

Table 4h. Observed (obs.) and relative (rel.) survival of patients with lung cancer by histology for period 1988-2013 (N=15,777).

C33, C34: Malignant neoplasm of lung and trachea
Histology
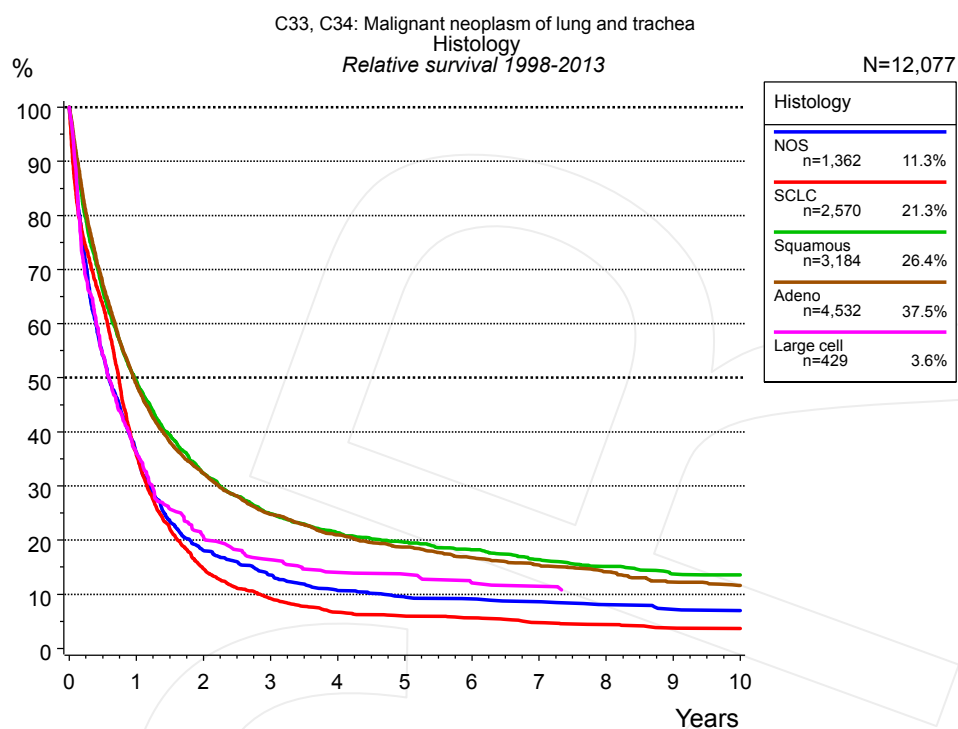*Relative survival 1998-2013*   N=12,077

Figure 4i. Relative survival of patients with lung cancer by histology. For 12,077 of 12,917 cases diagnosed between 1998 and 2013 valid data could be obtained for this item.

	Histology									
	NOS n=1,362		SCLC n=2,570		Squamous n=3,184		Adeno n=4,532		Large cell n=429	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1	35.3	36.3	35.1	35.9	48.1	49.5	47.7	48.8	35.6	36.2
2	17.2	18.1	14.2	14.7	30.7	32.3	31.0	32.3	19.8	20.5
3	12.6	13.5	8.7	9.2	23.0	24.9	23.3	24.8	15.7	16.4
4	9.8	10.7	6.3	6.7	19.2	21.3	19.3	20.9	13.2	14.1
5	8.5	9.5	5.5	6.0	17.2	19.6	16.9	18.7	12.6	13.7
6	8.1	9.1	5.2	5.7	15.5	18.2	14.8	16.7	10.8	12.1
7	7.6	8.6	4.3	4.8	13.7	16.4	13.3	15.4	10.4	11.5
8	6.8	8.1	3.9	4.4	12.3	15.1	11.9	14.1	9.4	10.4
9	6.1	7.2	3.3	3.8	10.8	13.7	10.1	12.3		
10	5.9	7.0	3.2	3.7	10.4	13.6	9.3	11.6		

Table 4j. Observed (obs.) and relative (rel.) survival of patients with lung cancer by histology for period 1998-2013 (N=12,077).

C33, C34: Malignant neoplasm of lung and trachea
Post-progression survival
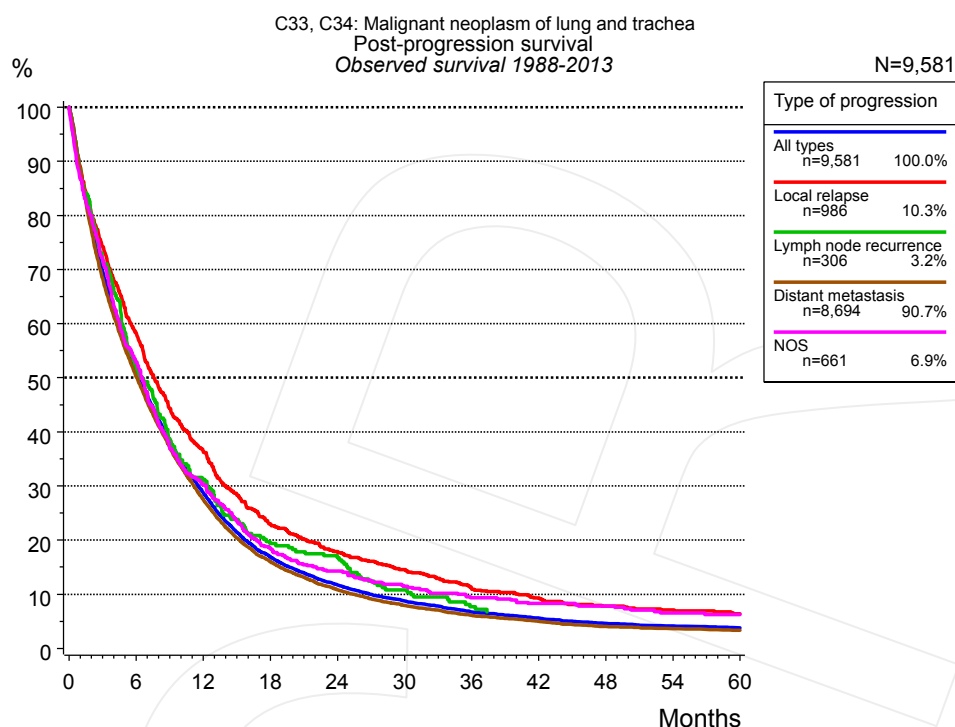*Observed survival 1988-2013*   N=9,581

Figure 5a. Observed post-progression survival of 9,581 patients with lung cancer diagnosed between 1988 and 2013 (incl. M1). These 9,581 patients with documented progression events during their course of disease represent 56.7% of the totally 16,892 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=3,261, 19.3%). Multiple progression types on different sites are included in the evaluation even when not occuring synchronously. The NOS (not otherwise specified) class is included under the condition, that it is the one and only progression type during the course of disease.

Medical record documentation often lacks the linguistic severity to distinguish between local relapse, regional lymph node metastasis and distant spread in solid cancers. Frequently, the statement "not specified" is the only information in registries regarding relapse of the disease. The category "All types" denotes all cases who suffered from at least one relapse during the course of disease (incl. primary M1-status). Although, the real number of relapsed patients is likely to be much higher. The accumulated percentage of patients with local relapse or distant metastasis exceeds the 100% value because patients are potientially considered in more than one subgroup.

	Type of progression				
	All types n=9,581	Local relapse n=986	Lymph node recurrence n=306	Distant metastasis n=8,694	NOS n=661
Months	%	%	%	%	%
0	100.0	100.0	100.0	100.0	100.0
12	28.8	36.3	31.2	27.5	30.1
24	11.7	17.9	16.7	10.8	14.3
36	6.8	11.0	7.7	6.1	9.3
48	4.6	7.8		4.0	7.8
60	3.8	6.4		3.3	6.2

Table 5b. Observed post-progression survival of patients with lung cancer for period 1988-2013 (N=9,581).

Shortcuts

MCR   Munich Cancer Registry, Germany (Tumorregister München)
NCI   National Cancer Institute, USA
SEER   Surveillance, Epidemiology, and End Results, USA
UICC   Union for International Cancer Control, Geneva

DCO   Death certificate only. The death certificate provides the only notification to the registry.
NA   Not available
NOS   Not otherwise specified

OS   Observed/overall survival (Kaplan-Meier estimate)
RS   Relative survival, compared to the general population,
        ratio of observed to expected survival (Ederer II method),
        reflecting excess mortality among cancer patients
AS   Assembled survival chart (observed, expected, relative)
PPS   Post-progression survival, survival since first relapse (Kaplan-Meier estimate)
        Date of entry: Date of first locoregional recurrence, distant metastasis, unspecified
progression
        Event: Death of all causes
CS   Conditional survival, survival probability under the condition of surviving a given period of time

Recommended Citation

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