Munich Cancer Registry

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

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

Cancer statistics: Survival

C56, D39.1: Ovarian cancer

Year of diagnosis	1988-2013
Patients	8,672
Diseases	8,692
Cases evaluated	4,634
Creation date	05/13/2015
Export date	12/30/2014
Population (females)	2.36 m

http://www.tumorregister-muenchen.de/en/facts/surv/surv_C56D_E.pdf

C56, D39.1: Malignant neoplasm of ovary (incl. borderline)
Period of diagnosis
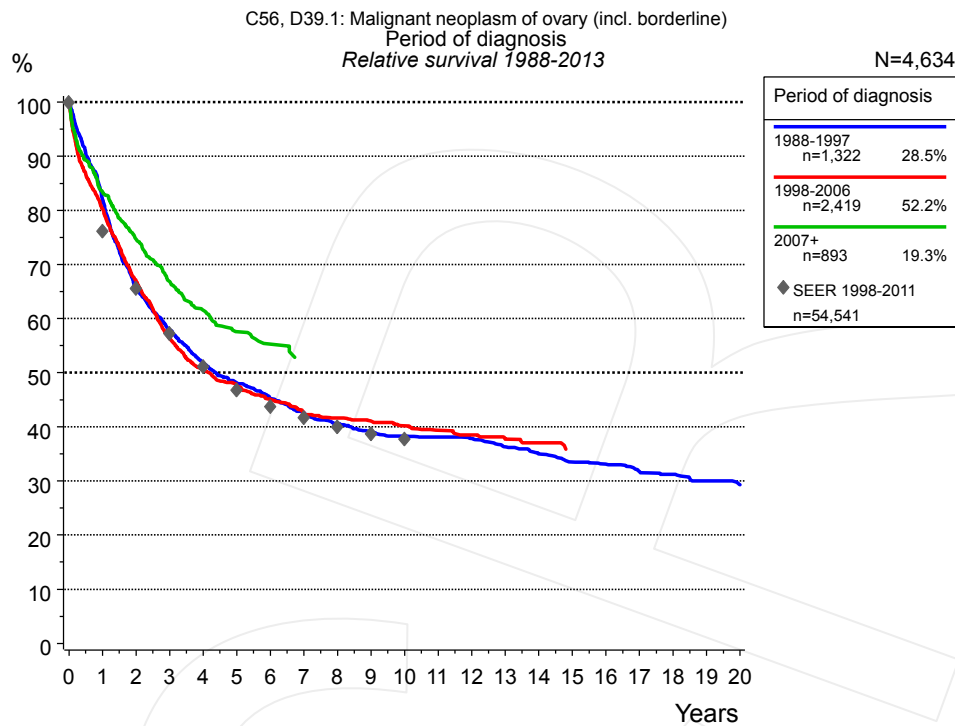*Relative survival 1988-2013*

Figure 1a. Relative survival of patients with ovarian cancer by period of diagnosis. Included in the evaluation are 4,634 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=1,322		1998-2006 n=2,419		2007+ n=893	
Years	obs. %	rel. %	obs. %	rel. %	obs. %	rel. %
0	100.0	100.0	100.0	100.0	100.0	100.0
1	80.5	81.9	78.6	80.3	82.0	83.4
2	63.9	65.9	64.5	66.9	72.6	74.6
3	55.3	57.9	53.7	56.4	64.3	66.8
4	48.8	51.8	47.4	50.5	58.2	61.6
5	44.7	48.1	44.1	47.7	53.7	57.6
6	41.4	45.3	41.2	45.1	51.1	55.3
7	38.4	42.5	38.4	42.6	48.2	51.7
8	36.1	40.6	37.1	41.6		
9	34.3	39.1	36.0	41.1		
10	33.2	38.3	34.7	40.2		
11	32.6	38.1	33.4	39.4		
12	31.7	37.8	32.3	38.5		
13	30.0	36.3	30.9	37.7		
14	28.5	35.0	30.0	37.0		
15	26.9	33.5				
16	26.1	33.1				
17	24.8	31.7				
18	24.1	31.2				
19	22.7	30.0				
20	21.8	29.3				

Table 1b. Observed (obs.) and relative (rel.) survival of patients with ovarian cancer by period of diagnosis for period 1988-2013 (N=4,634).

C56, D39.1: Malignant neoplasm of ovary (incl. borderline)
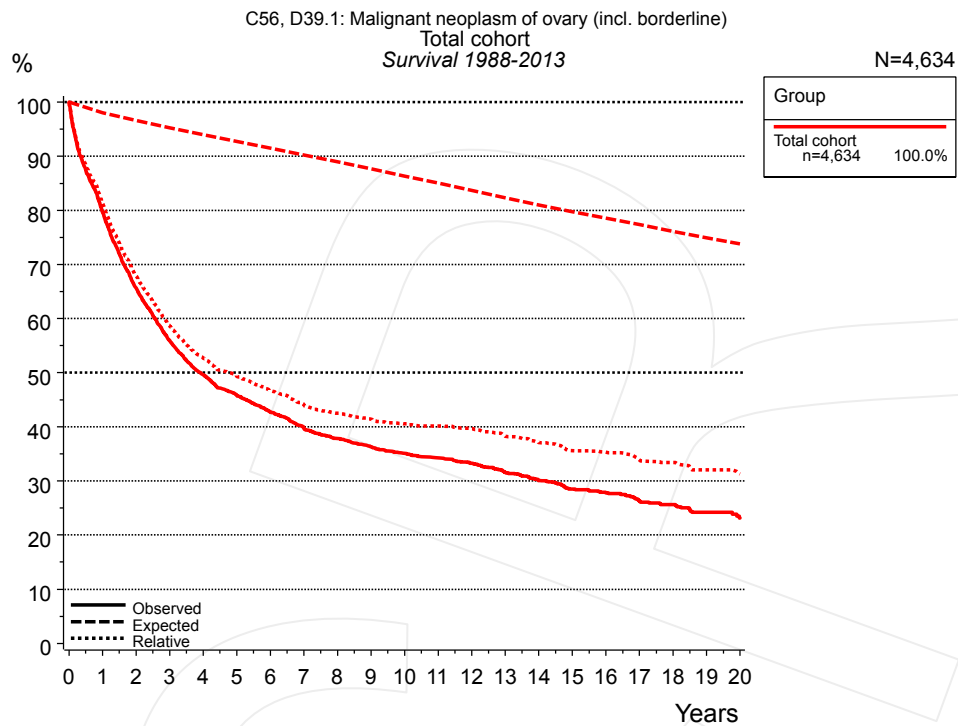Total cohort
Survival 1988-2013

Figure 2a. Observed, expected and relative survival of the total cohort with ovarian cancer. Included in the evaluation are 4,634 cases diagnosed between 1988 and 2013.

Years	Group Total cohort n=4,634	
	obs. %	rel. %
0	100.0	100.0
1	79.7	81.3
2	65.7	68.0
3	56.0	58.7
4	49.6	52.7
5	45.8	49.4
6	42.7	46.7
7	39.7	44.0
8	37.8	42.5
9	36.3	41.4
10	35.1	40.6
11	34.2	40.2
12	33.2	39.7
13	31.5	38.3
14	30.1	37.1
15	28.5	35.6
16	27.8	35.3
17	26.4	33.9
18	25.6	33.4
19	24.2	32.0
20	23.2	31.3

Table 2b. Observed (obs.) and relative (rel.) survival of the total cohort with ovarian cancer for period 1988-2013 (N=4,634).

C56, D39.1: Malignant neoplasm of ovary (incl. borderline)
Age category
Relative survival 1988-2013

N=4,634

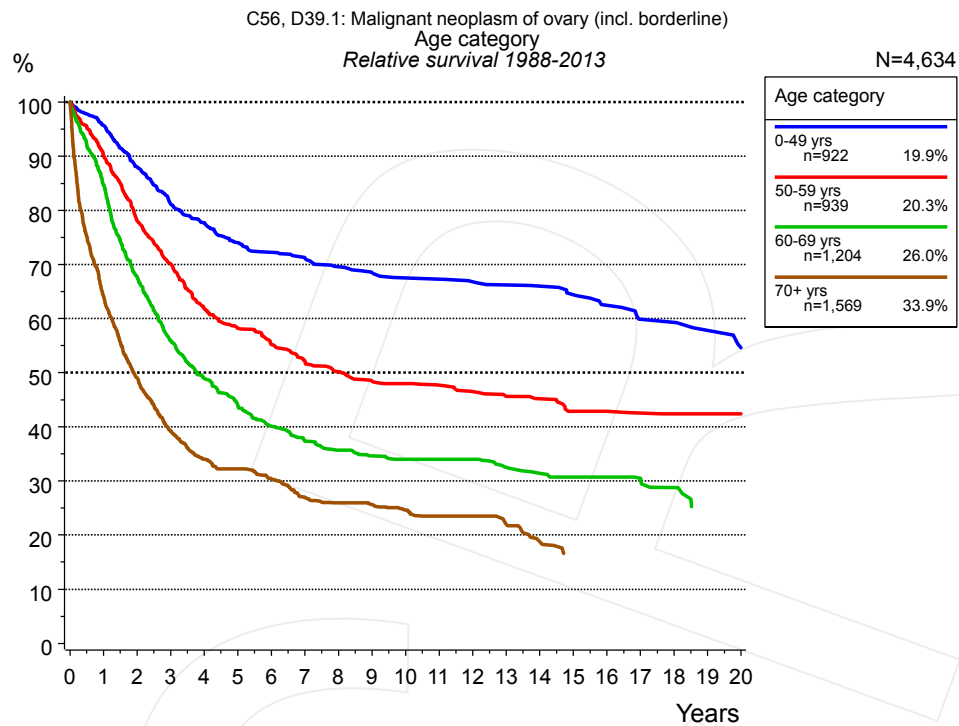| Age category		
0-49 yrs	n=922	19.9%
50-59 yrs	n=939	20.3%
60-69 yrs	n=1,204	26.0%
70+ yrs	n=1,569	33.9%

Figure 3a. Relative survival of patients with ovarian cancer by age category. Included in the evaluation are 4,634 cases diagnosed between 1988 and 2013.
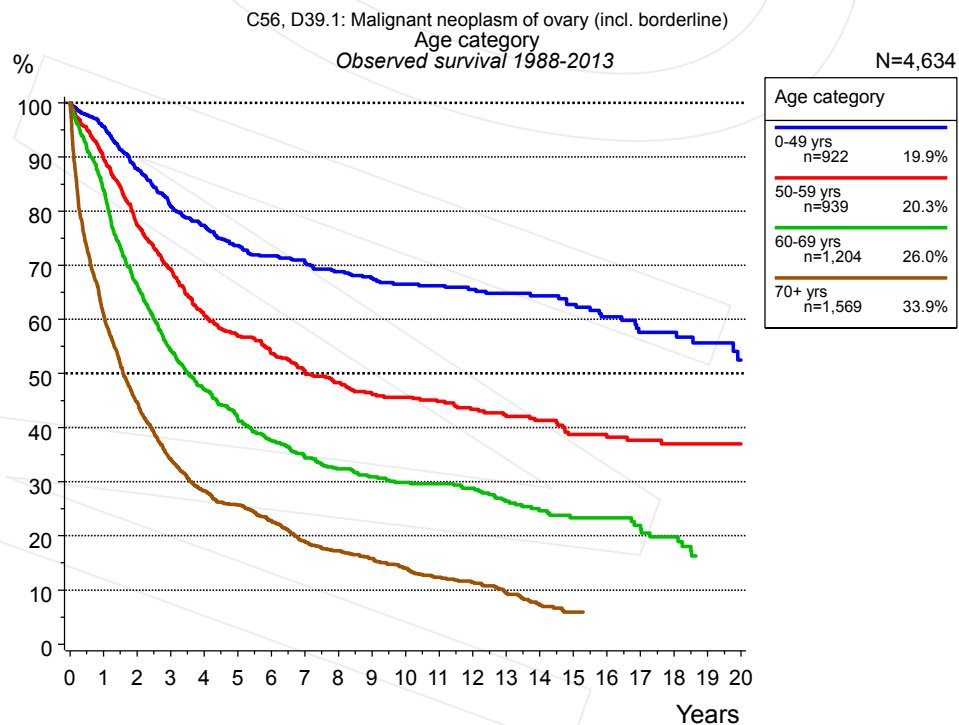
C56, D39.1: Malignant neoplasm of ovary (incl. borderline)
Age category
Observed survival 1988-2013

N=4,634

Age category		
0-49 yrs	n=922	19.9%
50-59 yrs	n=939	20.3%
60-69 yrs	n=1,204	26.0%
70+ yrs	n=1,569	33.9%

Figure 3b. Observed survival of patients with ovarian cancer by age category. Included in the evaluation are 4,634 cases diagnosed between 1988 and 2013.

| | Age category | | | | | | | |
| | 0-49 yrs n=922 | | 50-59 yrs n=939 | | 60-69 yrs n=1,204 | | 70+ yrs n=1,569 | |
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	95.7	95.7	89.8	90.1	84.0	84.7	61.0	64.0
2	87.9	88.0	77.5	78.1	66.5	67.7	44.7	49.0
3	81.0	81.2	69.3	70.1	54.4	55.9	34.3	39.3
4	77.4	77.7	60.7	61.8	47.0	49.0	28.3	34.0
5	73.7	74.0	56.9	58.2	41.7	44.0	25.7	32.2
6	71.8	72.2	53.7	55.2	37.7	40.1	22.8	30.4
7	70.6	71.2	50.6	52.2	34.4	37.3	19.0	26.9
8	68.8	69.6	48.3	50.2	32.4	35.7	17.2	25.9
9	67.6	68.5	46.3	48.4	30.9	34.6	15.8	25.6
10	66.5	67.5	45.6	48.0	29.9	34.0	14.0	24.6
11	66.2	67.3	44.9	47.7	29.7	34.0	12.4	23.5
12	65.6	66.8	43.4	46.5	28.8	34.0	11.5	23.5
13	64.8	66.2	42.1	45.6	26.4	32.5	9.5	22.0
14	64.3	66.0	41.3	45.2	24.7	31.4	7.2	18.7
15	62.8	64.4	38.8	42.9	23.3	30.7	5.9	16.6
16	60.5	62.5	38.2	42.8	23.3	30.7		
17	57.6	59.9	37.7	42.5	22.0	30.5		
18	57.6	59.3	37.0	42.4	19.8	28.8		
19	55.7	57.8	37.0	42.4	16.3	24.9		
20	52.5	54.6	37.0	42.4				

Table 3c. Observed (obs.) and relative (rel.) survival of patients with ovarian cancer by age category for period 1988-2013 (N=4,634).
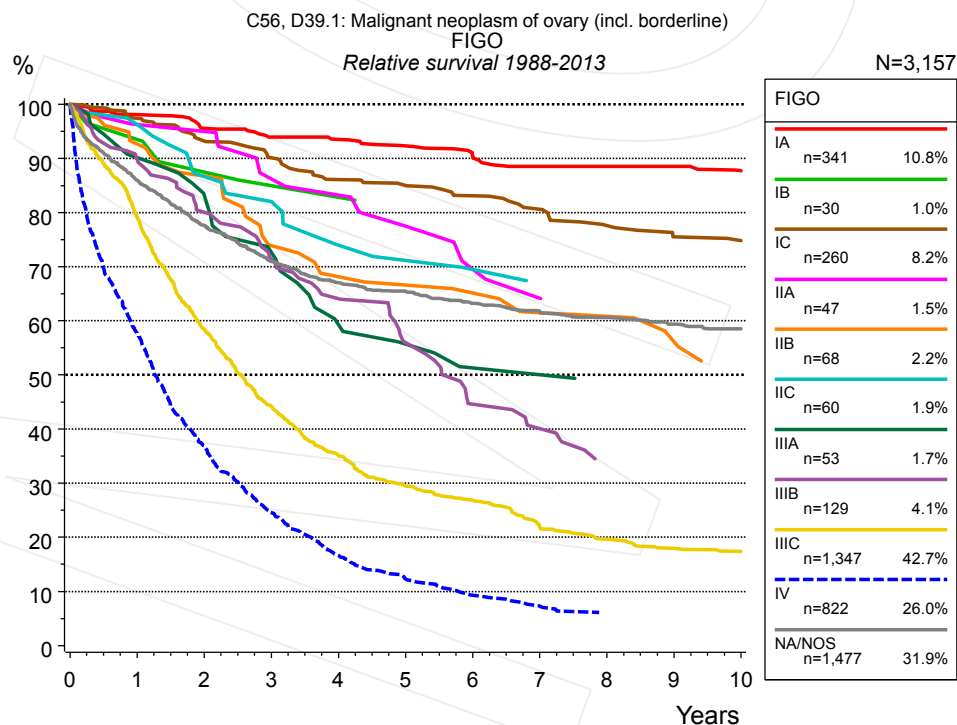

Figure 4a. Relative survival of patients with ovarian cancer by FIGO. For 4,244 of 4,634 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 3,157 cases an evaluable classification was established. The grey line represents the subgroup of 1,477 patients with missing values regarding FIGO (31.9% of 4,634 patients, the percent values of all other categories are related to n=3,157).

	IA n=341		IB n=30		IC n=260		IIA n=47		IIB n=68		IIC n=60		IIIA n=53	
FIGO														
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	97.3	98.1	96.4	93.5	96.9	97.4	95.6	96.3	92.4	92.6	96.6	96.3	90.2	90.2
2	94.0	95.6	88.7	87.5	91.9	93.2	95.6	95.0	85.9	86.7	85.7	86.7	82.2	83.3
3	91.6	94.0	84.7	84.9	87.8	90.2	85.4	86.2	71.5	73.9	81.5	82.1	71.9	72.7
4	90.5	93.5	84.7	82.8	83.1	86.1	82.6	83.2	65.8	68.1	70.8	74.0	58.4	59.3
5	88.6	92.3	80.0	80.3	81.5	85.0	74.0	77.5	63.7	66.6	68.3	71.2	53.9	55.7
6	85.9	90.4	80.0	77.8	78.7	83.1	67.3	69.6	61.3	65.1	65.4	69.5	49.1	51.3
7	83.6	88.6			75.7	80.6	63.7	64.2	56.5	61.5	62.4	67.3	49.1	50.0
8	83.1	88.6			71.8	77.6			56.5	60.8	62.4	66.8	46.2	49.0
9	81.9	88.6			68.8	75.5			51.4	56.0	62.4	66.2	46.2	48.2
10	80.1	87.7			68.0	74.8			46.0	52.3	62.4	65.7	46.2	47.4

cont'd	IIIB n=129		IIIC n=1,347		IV n=822		NA/NOS n=1,477	
FIGO								
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	89.1	89.7	78.0	79.2	56.2	57.8	84.0	86.0
2	79.0	80.1	56.6	58.5	35.4	36.9	74.4	77.6
3	69.7	71.5	42.3	44.2	23.2	24.5	67.0	71.0
4	62.6	64.1	33.0	35.1	15.6	16.6	62.3	67.1
5	53.5	56.0	27.4	29.5	11.3	12.3	59.8	65.5
6	42.0	44.6	24.6	26.9	8.4	9.3	56.9	63.2
7	37.9	40.1	19.6	21.9	6.5	7.3	54.7	61.7
8	31.7	34.2	17.5	19.6	5.3	6.0	52.9	60.6
9	31.7	32.5	15.8	18.0			50.8	59.4
10			15.1	17.4			49.2	58.5

Table 4b. Observed (obs.) and relative (rel.) survival of patients with ovarian cancer by FIGO for period 1988-2013 (N=3,157).
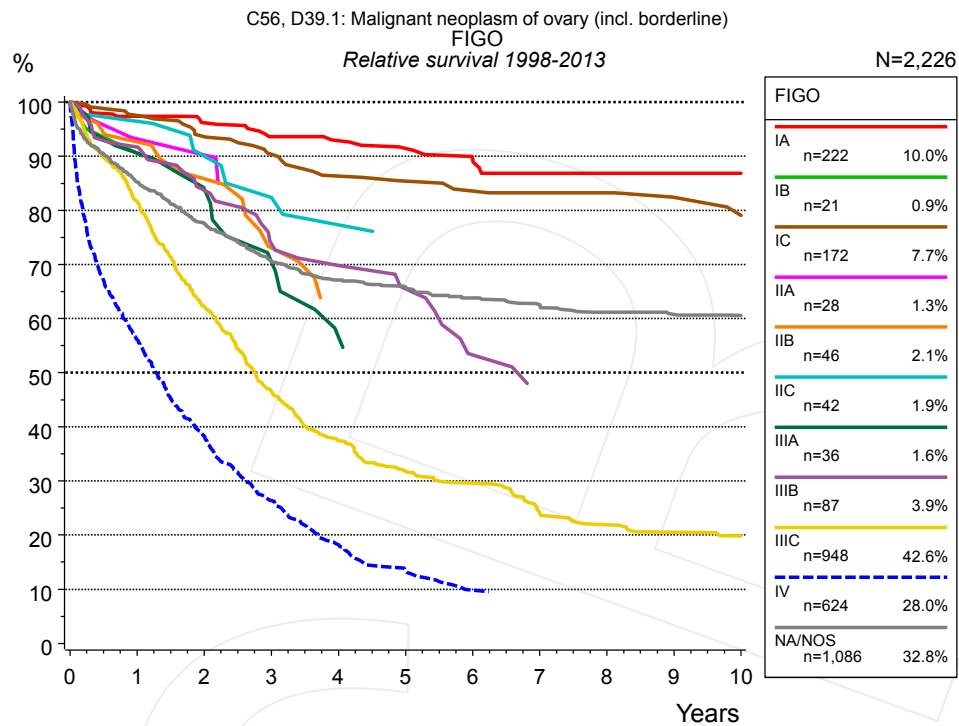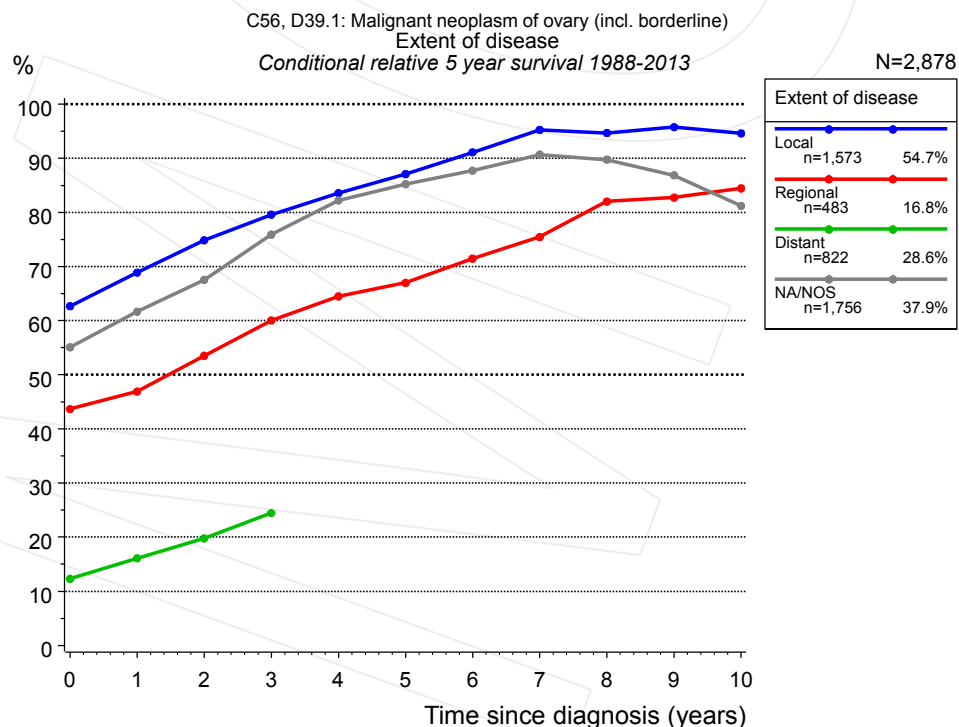
C56, D39.1: Malignant neoplasm of ovary (incl. borderline)
FIGO
Relative survival 1998-2013

FIGO		
IA	n=222	10.0%
IB	n=21	0.9%
IC	n=172	7.7%
IIA	n=28	1.3%
IIB	n=46	2.1%
IIC	n=42	1.9%
IIIA	n=36	1.6%
IIIB	n=87	3.9%
IIIC	n=948	42.6%
IV	n=624	28.0%
NA/NOS	n=1,086	32.8%

Figure 4c. Relative survival of patients with ovarian cancer by FIGO. For 3,016 of 3,312 cases diagnosed between 1998 and 2013 valid data could be obtained for this item. For a total of 2,226 cases an evaluable classification was established. The grey line represents the subgroup of 1,086 patients with missing values regarding FIGO (32.8% of 3,312 patients, the percent values of all other categories are related to n=2,226).

	FIGO													
	IA n=222		IB n=21		IC n=172		IIA n=28		IIB n=46		IIC n=42		IIIA n=36	
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	96.8	97.4	95.0	90.6	97.0	97.5	92.6	93.2	93.4	92.7	97.6	96.4	91.4	90.6
2	94.7	96.2	89.4	86.7	92.4	93.6	92.6	90.3	85.6	85.8	89.5	90.0	82.6	84.0
3	91.2	93.6			88.1	90.4	83.3	84.0	70.9	73.0	83.1	82.4	70.1	70.5
4	89.9	92.9			83.4	86.3	83.3	82.6	61.0	63.8	76.7	77.3	56.1	56.6
5	87.8	91.4			81.5	85.4	83.3	81.2	61.0	63.6	72.4	74.6	52.6	52.7
6	85.2	89.3			79.3	83.6			61.0	63.5				
7	82.1	86.9			78.1	83.3			61.0	63.4				
8	82.1	86.9			78.1	83.3			61.0	63.2				
9	82.1	86.9			74.6	82.4								
10	79.9	86.9			72.1	79.1								

	FIGO							
cont'd	IIIB n=87		IIIC n=948		IV n=624		NA/NOS n=1,086	
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	92.0	91.7	80.3	81.7	54.7	56.1	83.2	85.2
2	83.0	83.7	60.2	62.2	36.7	38.3	74.3	77.5
3	72.3	73.8	44.7	46.6	24.8	26.4	66.8	70.6
4	68.9	69.8	35.2	37.4	17.1	18.2	62.5	67.1
5	62.8	65.5	29.5	31.8	12.3	13.4	60.4	65.9
6	50.3	53.3	27.2	29.6	9.0	9.8	57.9	63.8
7	44.6	47.4	21.5	24.0			56.1	62.6
8			19.5	21.9			54.1	61.2
9			18.0	20.5			53.1	60.8
10			17.0	19.8			52.3	60.6

Table 4d. Observed (obs.) and relative (rel.) survival of patients with ovarian cancer by FIGO for period 1998-2013 (N=2,226).

Figure 4e. Conditional relative 5-year survival of patients with ovarian cancer by extent of disease. For 4,244 of 4,634 cases diagnosed between 1988 and 2013 valid data could be obtained for this item. For a total of 2,878 cases an evaluable classification was established. The grey line represents the subgroup of 1,756 patients with missing values regarding extent of disease (37.9% of 4,634 patients, the percent values of all other categories are related to n=2,878).

	Extent of disease							
	Local		Regional		Distant		NA/NOS	
		Cond. surv. %		Cond. surv. %		Cond. surv. %		Cond. surv. %
Years	n	5 yrs	n	5 yrs	n	5 yrs	n	5 yrs
0	1,573	62.7	483	43.7	822	12.3	1,756	55.1
1	1,279	68.9	390	46.9	438	16.1	1,405	61.7
2	1,049	74.9	273	53.5	248	19.8	1,112	67.5
3	889	79.6	193	60.0	143	24.5	858	75.9
4	762	83.6	149	64.5			679	82.2
5	651	87.1	119	67.0			564	85.2
6	560	91.1	98	71.5			475	87.7
7	489	95.3	82	75.4			397	90.7
8	431	94.7	68	82.0			336	89.7
9	377	95.8	60	82.7			293	86.9
10	337	94.6	54	84.4			244	81.2

Table 4f. Conditional relative 5-year survival of patients with ovarian cancer by extent of disease for period 1988-2013 (N=2,878).

Conditional relative survival rates refer to the relative survival probability, in this case for 5 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 extent of disease="Local", who are alive at least 3 years after cancer diagnosis, the conditional relative 5-year survival rate is 79.6% (n=889).
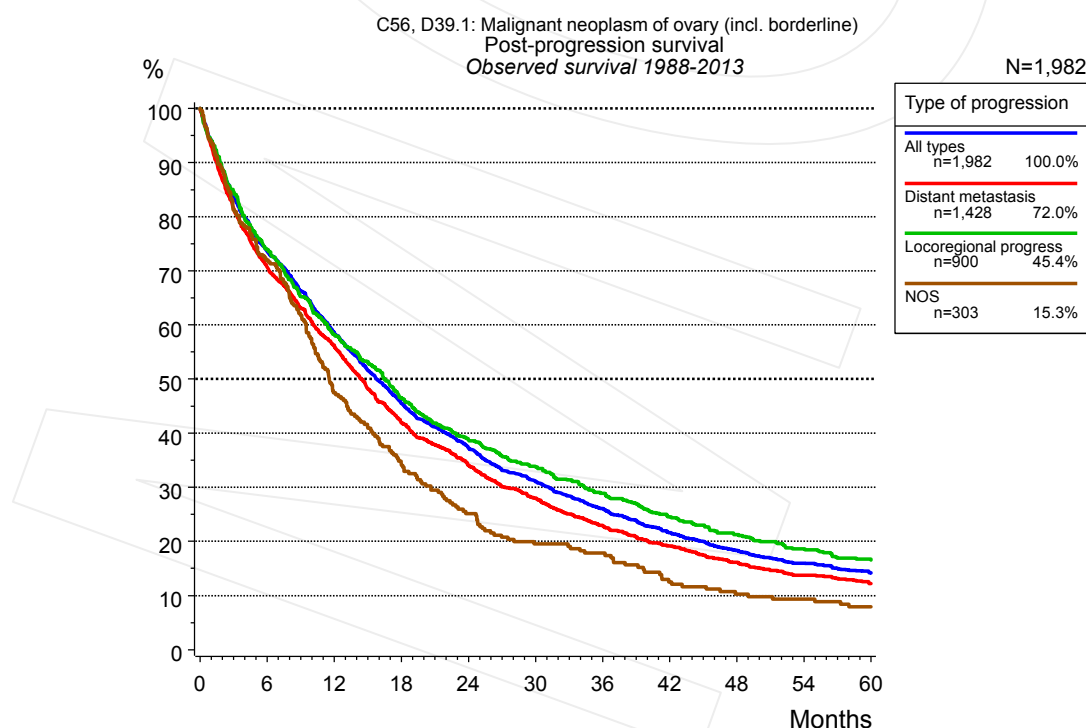

Figure 5a. Observed post-progression survival of 1,982 patients with ovarian cancer diagnosed between 1988 and 2013 (incl. M1). These 1,982 patients with documented progression events during their course of disease represent 42.8% of the totally 4,634 evaluated cases. Patients with cancer relapse documented via death certificates only were excluded (n=548, 11.8%). 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	Distant metastasis	Locoregional progress	NOS
	n=1,982	n=1,428	n=900	n=303
Months	%	%	%	%
0	100.0	100.0	100.0	100.0
12	58.5	56.0	58.2	47.5
24	37.4	34.1	38.9	25.1
36	26.1	22.9	28.9	17.8
48	18.3	16.1	21.2	10.3
60	14.1	12.2	16.5	7.9

Table 5b. Observed post-progression survival of patients with ovarian cancer for period 1988-2013 (N=1,982).

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

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