

Cancer survival in the Spearhead Primary Care Trusts of England, 1998-2004

One- and five-year relative survival estimates for cancer patients diagnosed in 1998-2003 and resident in ‘Spearhead’ Primary Care Trusts, compared with those in the rest of England: 10 common cancers, by sex.

This report presents cancer survival estimates for adult patients (aged 15-99 years at diagnosis) resident in the 88 ‘Spearhead’ Primary Care Trusts (PCT) in England, compared with those resident in the rest of England, who were diagnosed during 1998-2003 and followed up to the end of 2004 (see technical notes 1-3). Table 1 and the charts give the one- and five-year age-standardised relative survival estimates (technical notes 4 and 5) for patients diagnosed with one of the following ten cancers: bladder, breast (women), cervix, colon, lung, oesophagus, ovary, prostate, rectum and stomach. Differences between survival for ‘Spearhead’ PCTs and the rest of England were tested for statistical significance; p-values are given in Table 1 (see technical note 6).

For most of the ten cancers, over 1,000 cases a year occurred in residents of ‘Spearhead’ PCTs. For the most frequent – cancer of the breast in women – there were on average 9,000 cases eligible for analysis in the ‘Spearhead’ PCT group. Even for the least frequent of the ten cancers examined (cancer of the oesophagus), 600 or more cases in ‘Spearhead’ PCTs could be included in the analysis. For these ten cancers, cancer survival estimates for the ‘Spearhead’ PCTs can thus be considered reasonably robust.

Five-year age-standardised relative survival estimates for patients diagnosed with the four most common cancers are given in the table below. These cancers account for around 50 per cent of all cancers in adults. Full details are given in Table 1.

Five-year relative survival estimates (%) up to 2004 for adult patients diagnosed during 1998-2003, major cancers, ‘Spearhead’ Primary Care Trusts and the rest of England

Cancer		Spearhead PCTs		Rest of England		Difference† (% points)
		Number of patients	Five-year relative survival* (%)	Number of patients	Five-year relative survival* (%)	
Breast	Women	54,019	78.2	136,340	79.8	- 1.6
Colon	Men	13,828	47.1	32,813	48.3	- 1.2
	Women	13,062	47.9	32,585	49.6	- 1.7
Lung	Men	34,545	5.9	59,478	6.6	- 0.7
	Women	23,234	7.5	36,750	7.6	- 0.1
Prostate	Men	37,335	69.2	96,451	71.1	- 1.9

* Age-standardised (see technical note 5)

† See technical note 7

Five-year survival for patients resident in ‘Spearhead’ PCTs was 1.6% lower than in the rest of England for breast cancer in women, and 1.9% lower for prostate cancer. In

'Spearhead' PCTs, five-year survival for colon cancer was 1.2% and 1.7% lower for men and women, respectively, than in the rest of England. Survival from lung cancer in both men and women was consistently low in all PCTs (6-8%), but still 0.7% lower among men in 'Spearhead' PCTs than in the rest of England.

For cancer patients resident in 'Spearhead' PCTs, survival was significantly lower at one year after diagnosis for 15 of the 16 sex-cancer combinations examined; and at five years after diagnosis for 12 of the 16.

The difference in one-year relative survival estimates between 'Spearhead' PCTs and all other PCTs ranged from -4.7% (oesophagus, men) to -0.5% (lung, women), with an average difference of -2.3%.

The average difference in five-year relative survival between 'Spearhead' PCTs and the rest of England was -1.7%. Survival was actually higher in 'Spearhead' PCTs than in all other PCTs for cancers of the cervix and ovary, but not significantly so. The largest difference in five-year survival (-4.5%) was seen for bladder cancer in women.

Acknowledgements

The National Cancer Intelligence Centre at the Office for National Statistics and the London School of Hygiene and Tropical Medicine wishes to acknowledge the work of the regional cancer registries in England over the years that the national cancer registration scheme has been in operation.

Technical Notes

1) The 2010 Public Service Agreement target for life expectancy inequalities and the inequalities elements of the cancer and heart disease PSA targets aim to narrow the gap between the population as a whole and the "fifth of areas with the worst health and deprivation indicators". These are the 'Spearhead Group' of areas. Announced on 19 November 2004, the 'Spearhead Group' consists of the Local Authority areas, and the PCTs which map to them, that are in the bottom fifth nationally for 3 or more of the following measures:

- Male life expectancy at birth
- Female life expectancy at birth
- Cancer mortality rate in under 75s
- Cardiovascular disease mortality rate in under 75s
- Index of Multiple Deprivation 2004 (Local Authority Summary), average score.

The 'Spearhead Group' is a fixed list of 70 Local Authorities, and the 62 (formerly 88) PCTs that map to them. It forms the focus for Government action to tackle inequalities in life expectancy, cancer and cardiovascular disease.

For further details on the location of the 'Spearhead PCTs' please go to: http://www.dh.gov.uk/en/Publicationsandstatistics/Lettersandcirculars/Dearcolleagueletters/DH_4138963

2) All adult (15-99 years) residents of England who were diagnosed during the period 1998-2003 with one of the ten selected cancers as a first, primary, invasive, malignant neoplasm were eligible for inclusion in the analyses. Records of benign or *in situ*

tumours, or those of uncertain behaviour, were considered ineligible. Patients known to have had a previous invasive primary malignancy (except non-melanoma skin cancer) at any site at any time since 1971 were excluded. We noted a small but steady increase in the overall quality of the data and in the proportion of records of sufficient quality for inclusion in survival analyses. For more details about exclusions from analysis, see ref.[1,2]

3) Relative survival estimates for the same 10 common cancers were published on the National Statistics website on 4 April 2007 [3] for patients resident in ‘Spearhead’ Primary Care Trusts compared with those in the rest of England, and diagnosed during 1996-2001 and followed up to 31 December 2003.

4) Crude survival is the proportion of the original group of cancer patients diagnosed in a particular period who are still alive at the specified time after diagnosis; it is based on all deaths, whatever their cause. By contrast, relative survival aims to estimate net survival, i.e. the survival of cancer patients *relative to that of the general population from which they are drawn*. It reflects the fact that some cancer patients will die from other causes. Relative survival is given by the ratio of the crude survival and the survival that would have been expected if the cancer patients had experienced the same death rates by age and sex (background mortality) as the general population. Life tables are used to provide these measures of background mortality, specific for single year of age at death, for sex, and - where possible - for socio-economic deprivation and/or geographic region. For these analyses, it proved impossible to construct new life tables for the populations of the Spearhead PCTs in the time available. Instead, we used regional life tables that we had previously constructed and which are specific to each of the Government Office Regions, based on mortality centred on 2001. When the analyses were performed, all patients diagnosed during 1998-2003 had been followed up to the end of 2004. Survival up to one year after diagnosis could therefore be calculated using data for all patients diagnosed during 1998-2003. Survival from one to two years could be calculated using data for those diagnosed during 1998-2002; from two to three years using data for those diagnosed 1998-2001; from three to four years using data for those diagnosed 1998-2000; and from four to five years using data for those diagnosed in 1998-1999. The overall estimate of five-year survival was constructed from all these interim estimates. This is called “complete” analysis, to distinguish it from “cohort” analysis, in which only patients who have been followed up for at least five years can contribute to the estimation of five-year survival. With follow-up data available at the time, cohort analysis would have been restricted to patients diagnosed in 1998-99.

5) Because cancer survival varies with age at diagnosis and the age distribution of cancer cases differs geographically, the overall (all ages) survival estimates have been age-standardised to improve the comparability between geographical areas and over time. We used the standard weights given in Chapter 3 of the monograph *Cancer Survival Trends* [1].

6) Statistical significance tests enable us to estimate the probability (p) that a difference in survival between two populations indicates a real difference rather than being due to chance. A result that would be expected to occur less than one in 20 times by chance ($p < 0.05$) is conventionally described as statistically significant (at the 5% level).

7) The absolute difference between five-year relative survival (%) for patients resident in 'Spearhead' PCTs and those resident in the rest of England is given in percentage points; thus for breast cancer, the survival of 78.2% in 'Spearhead' PCTs is lower than 79.8% in the rest of England, so the difference is shown as -1.6 percentage points.

References

1. Coleman MP, Babb P, Damiacki P, Grosclaude P, Honjo S, Jones J, Knerer G, Pitard A, Quinn MJ, Sloggett A and De Stavola BL (1999) Cancer Survival Trends in England and Wales 1971-1995: deprivation and NHS Region. Studies on Medical and Population Subjects No.61. London: The Stationery Office, 1999
2. Coleman MP, Rachet B, Woods LM, Mitry E, Riga M, Cooper N, Quinn MJ, Brenner H, Estève J. Trends and socio-economic inequalities in cancer survival in England and Wales up to 2001. Br J Cancer 2004; **90**: 1367-1373.
3. Office for National Statistics; Coleman MP, Rachet B, Cooper N, Westlake S & Quinn MJ. Cancer survival in persons resident in the 88 "Spearhead" Primary Care Trusts [one- and five-year survival for patients diagnosed in 1996-2001 followed up to 2003: 10 major cancers. England, Spearhead PCOs]. London: National Statistics website. [4 April 2007] <http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=14821&Pos=&ColRank=1&Rank=272>

The survival analyses and the commentary in this report were produced in collaboration between the London School of Hygiene and Tropical Medicine^a (LSHTM), and the National Cancer Intelligence Centre, Office for National Statistics^b (ONS).

Bernard Rachet^a, Michel P Coleman^a, Libby Ellis^a, Anjali Shah^a, Nicola Cooper^b, Domenica Rasulo^b, Susan Westlake^b

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Table 1: One- and five-year age-standardised¹ relative survival (%) for adult² patients diagnosed during 1998-2003, 10 common cancers, by sex: 'Spearhead' Primary Care Trusts (PCTs)³ and Rest of England⁴

Cancer ⁵		Patients diagnosed 1998-2003 ⁶													Significance (p-value) of difference	
		Spearhead PCTs					Rest of England					Difference ⁸				
		Number of patients ⁷	One-year relative survival		Five-year relative survival		Number of patients ⁷	One-year relative survival		Five-year relative survival						
			%	95% CI ⁹	%	95% CI ⁹		%	95% CI ⁹	%	95% CI ⁹	One year	Five year	One year		
Bladder	Men	10,789	77.3	(76.5 - 78.2)	57.1	(55.6 - 58.5)	24,778	78.8	(78.3 - 79.4)	60.4	(59.5 - 61.3)	-1.5	-3.3	<0.01	<0.01	
	Women	4,513	66.3	(64.9 - 67.8)	49.1	(47.2 - 51.0)	9,337	70.4	(69.4 - 71.4)	53.6	(52.3 - 55.0)	-4.1	-4.5	<0.01	<0.01	
	Persons	15,302	73.9	(73.2 - 74.6)	55.0	(53.8 - 56.1)	34,115	76.4	(75.9 - 76.9)	58.6	(57.8 - 59.3)	-2.5	-3.6	<0.01	<0.01	
Breast	Women	54,019	93.5	(92.3 - 93.7)	78.2	(77.6 - 78.7)	136,340	94.2	(94.0 - 94.3)	79.8	(79.4 - 80.1)	-0.7	-1.6	<0.01	<0.01	
Cervix	Women	5,049	81.4	(80.3 - 82.5)	63.3	(61.8 - 64.9)	8,639	82.2	(81.3 - 83.3)	62.7	(61.4 - 63.9)	-0.8	+0.6	0.281	0.509	
Colon	Men	13,828	66.1	(65.2 - 66.9)	47.1	(45.8 - 48.5)	32,813	69.3	(68.8 - 69.8)	48.3	(47.5 - 49.1)	-3.2	-1.2	<0.01	<0.01	
	Women	13,062	65.9	(65.0 - 66.7)	47.9	(46.7 - 49.1)	32,585	68.9	(68.4 - 69.5)	49.6	(48.9 - 50.4)	-3.0	-1.7	<0.01	<0.01	
	Persons	26,890	65.9	(65.3 - 66.5)	47.4	(46.5 - 48.3)	65,398	69.0	(68.6 - 69.4)	48.9	(48.4 - 49.5)	-3.1	-1.5	<0.01	<0.01	
Lung	Men	34,545	24.3	(23.9 - 24.8)	5.9	(5.6 - 6.3)	59,478	25.6	(25.2 - 25.9)	6.6	(6.3 - 6.8)	-1.3	-0.7	<0.01	<0.01	
	Women	23,234	26.9	(26.3 - 27.5)	7.5	(7.1 - 8.0)	36,750	27.4	(26.9 - 27.9)	7.6	(7.3 - 8.0)	-0.5	-0.1	<0.01	<0.01	
	Persons	57,779	25.3	(25.0 - 25.7)	6.6	(6.3 - 6.8)	96,228	26.3	(26.0 - 26.6)	6.9	(6.7 - 7.1)	-1.0	-0.3	<0.01	<0.01	
Oesophagus	Men	6,108	29.4	(28.2 - 30.6)	7.4	(6.5 - 8.3)	13,909	34.1	(33.3 - 34.9)	8.8	(8.1 - 9.4)	-4.7	-1.4	<0.01	<0.01	
	Women	3,802	32.0	(30.4 - 33.6)	8.9	(7.4 - 10.5)	8,213	34.7	(33.6 - 35.8)	11.6	(10.6 - 12.6)	-2.7	-2.7	<0.01	<0.01	
	Persons	9,910	30.1	(29.2 - 31.0)	8.0	(7.3 - 8.8)	22,122	34.1	(33.4 - 34.7)	9.7	(9.2 - 10.3)	-4.0	-1.7	<0.01	<0.01	
Ovary	Women	8,655	66.0	(65.0 - 66.9)	39.2	(38.8 - 40.5)	20,851	68.0	(67.4 - 68.6)	37.9	(37.1 - 38.7)	-2.0	+1.3	<0.01	0.082	
Prostate	Men	37,335	90.0	(89.6 - 90.4)	69.2	(68.2 - 70.2)	96,451	90.6	(90.4 - 90.9)	71.1	(70.5 - 71.6)	-0.6	-1.9	<0.01	<0.01	
Rectum	Men	11,925	72.3	(71.4 - 73.2)	46.6	(45.2 - 48.1)	24,111	76.0	(75.4 - 76.6)	50.8	(49.8 - 51.7)	-3.7	-4.2	<0.01	<0.01	
	Women	7,715	75.0	(74.0 - 76.0)	50.1	(48.5 - 51.7)	16,863	77.2	(76.5 - 77.8)	53.7	(52.6 - 54.7)	-2.2	-3.6	<0.01	<0.01	
	Persons	19,640	73.2	(72.6 - 73.9)	47.7	(46.7 - 48.8)	40,974	76.4	(76.0 - 76.8)	52.1	(51.4 - 52.8)	-3.2	-4.4	<0.01	<0.01	
Stomach	Men	9,525	33.8	(32.8 - 34.8)	12.6	(11.6 - 13.5)	16,217	36.6	(35.9 - 37.4)	13.0	(12.3 - 13.7)	-2.8	-0.4	<0.01	0.021	
	Women	5,241	35.2	(33.8 - 36.6)	14.8	(13.5 - 16.2)	8,534	37.7	(36.6 - 38.8)	16.3	(15.3 - 17.4)	-2.5	-1.5	<0.01	0.021	
	Persons	14,766	34.4	(33.6 - 35.1)	13.3	(12.5 - 14.0)	24,751	36.9	(36.3 - 37.5)	14.2	(13.6 - 14.7)	-2.5	-0.9	<0.01	0.021	

¹ Cancer survival varies with age at diagnosis, so the survival rates for all ages (15-99 years) have been age-standardised to control for differences in the age profile of cancer patients between geographical areas (see text).

² Aged 15-99 years at diagnosis.

³ On 19 November 2004, the Department of Health named the 88 most health-deprived Primary Care Trusts (PCTs) in England included in the 'Spearhead' Group.

⁴ All other Primary Care Trusts (PCTs) in England not included in the 'Spearhead' Group.

⁵ See table in the worksheet 'ICD site codes' for the International Classification of Diseases, Tenth Revision (ICD-10) codes used for cancers diagnosed from 1998 to 2003.

⁶ Adult patients diagnosed with one of 10 common cancers during 1998-2003 in 'Spearhead' PCTs and the rest of England and followed up to the end of 2004.

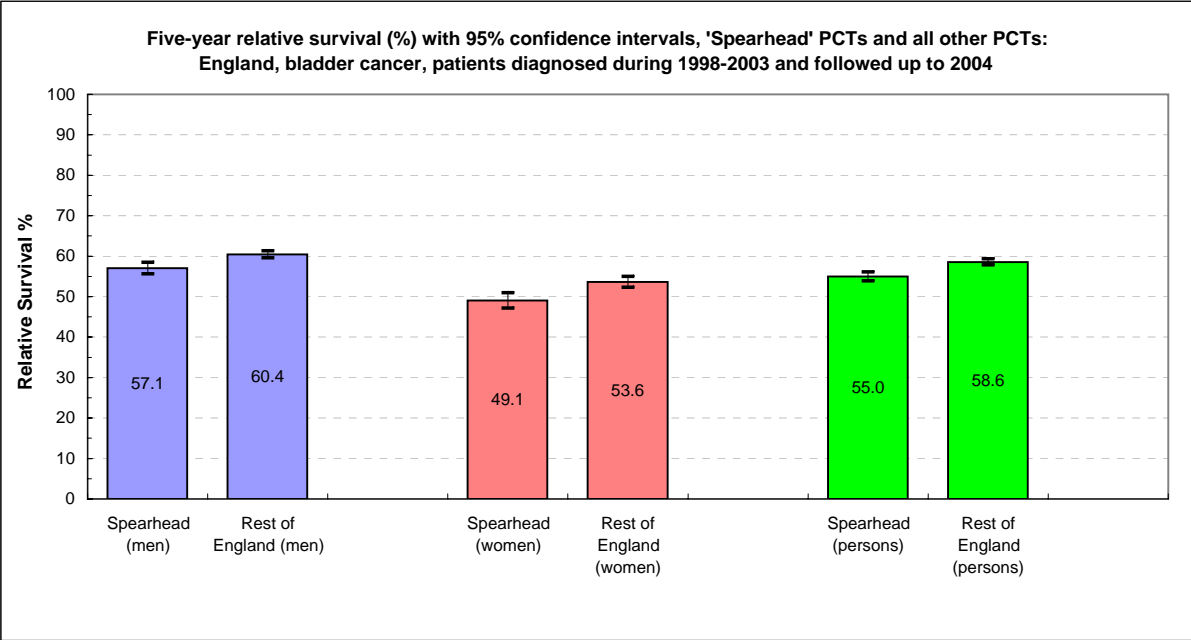
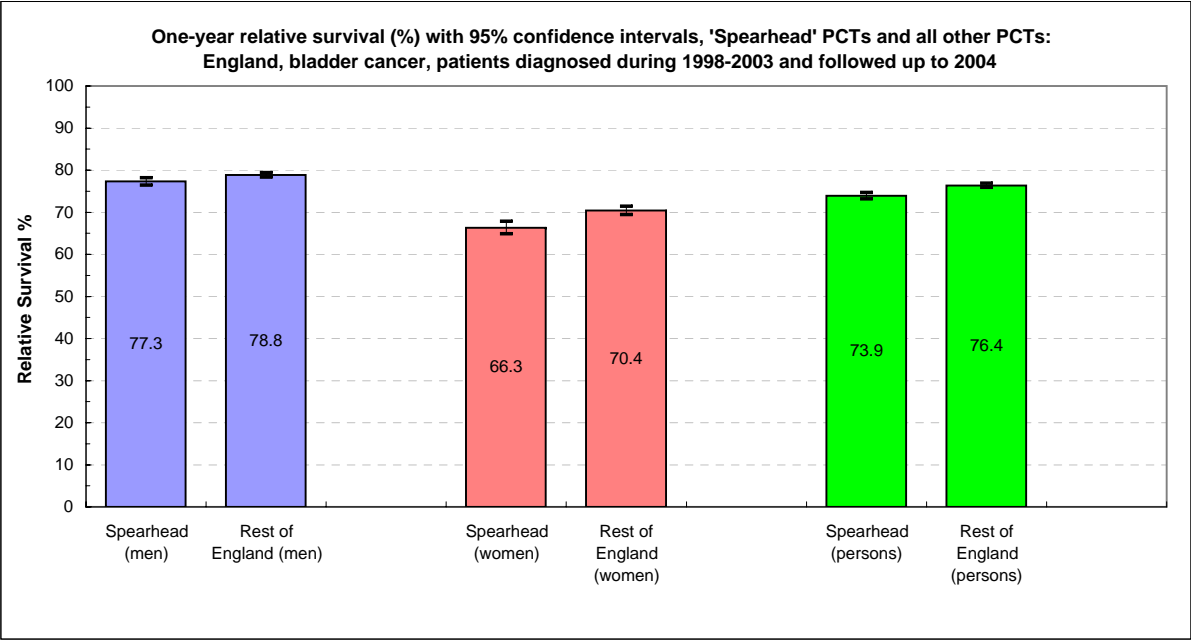
⁷ Eligible patients included in the survival analysis; for exclusion criteria see Coleman MP et al (1999) Cancer Survival Trends in England and Wales 1971-1995: deprivation and NHS Region. Studies on Medical and Population Subjects No.61. London: The Stationery Office.

⁸ The difference (in percentage points) between the relative survival for patients resident in 'Spearhead' PCTs and in the rest of England.

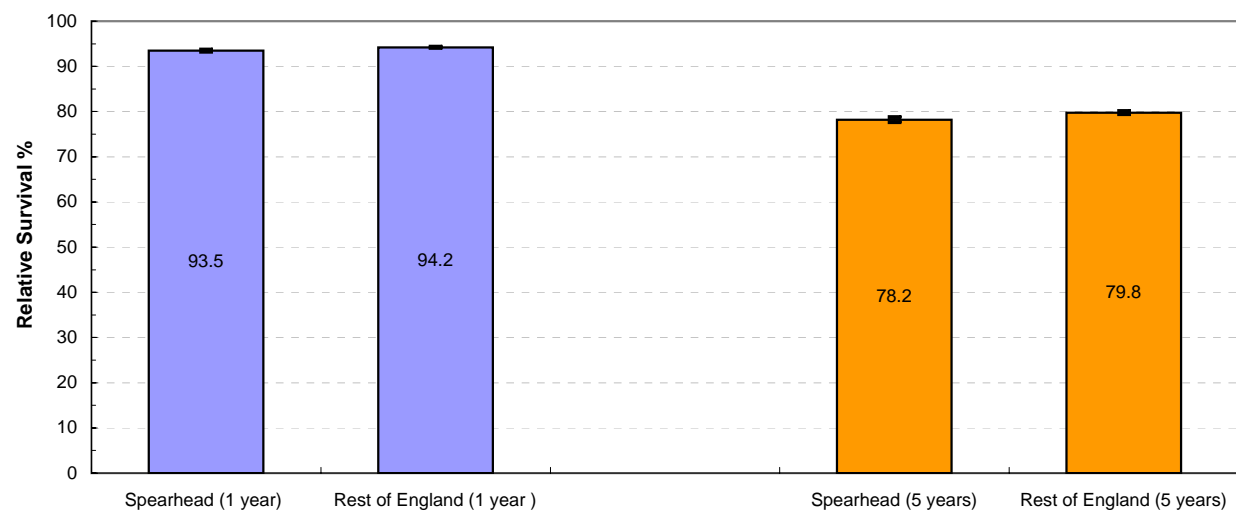
⁹ 95% confidence interval.

International Classification of Diseases (ICD) Tenth Revision codes for selected cancers

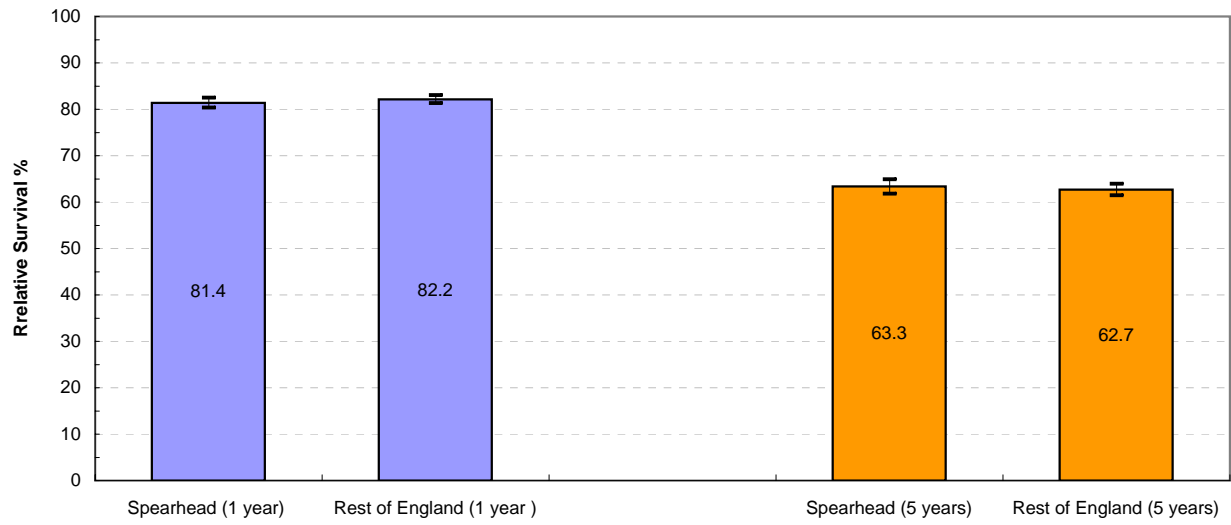
Cancer	ICD-10 codes
Bladder	C67
Breast	C50
Cervix	C53
Colon	C18
Lung	C33, C34
Oesophagus	C15
Ovary	C56
Prostate	C61
Rectum	C19 - C20
Stomach	C16

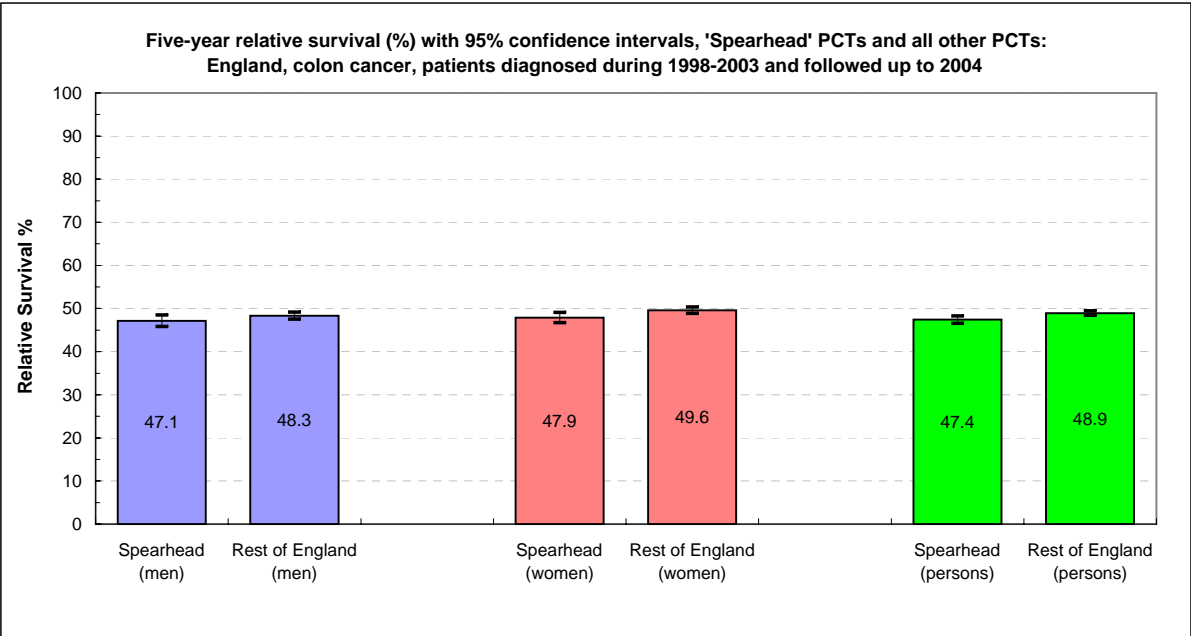
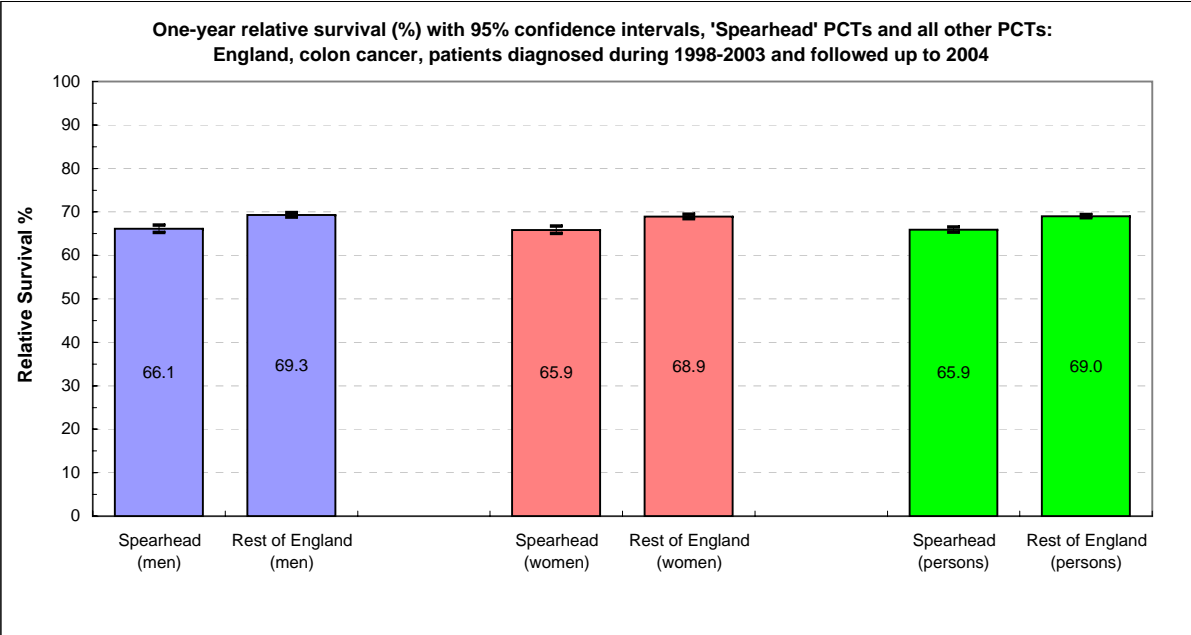


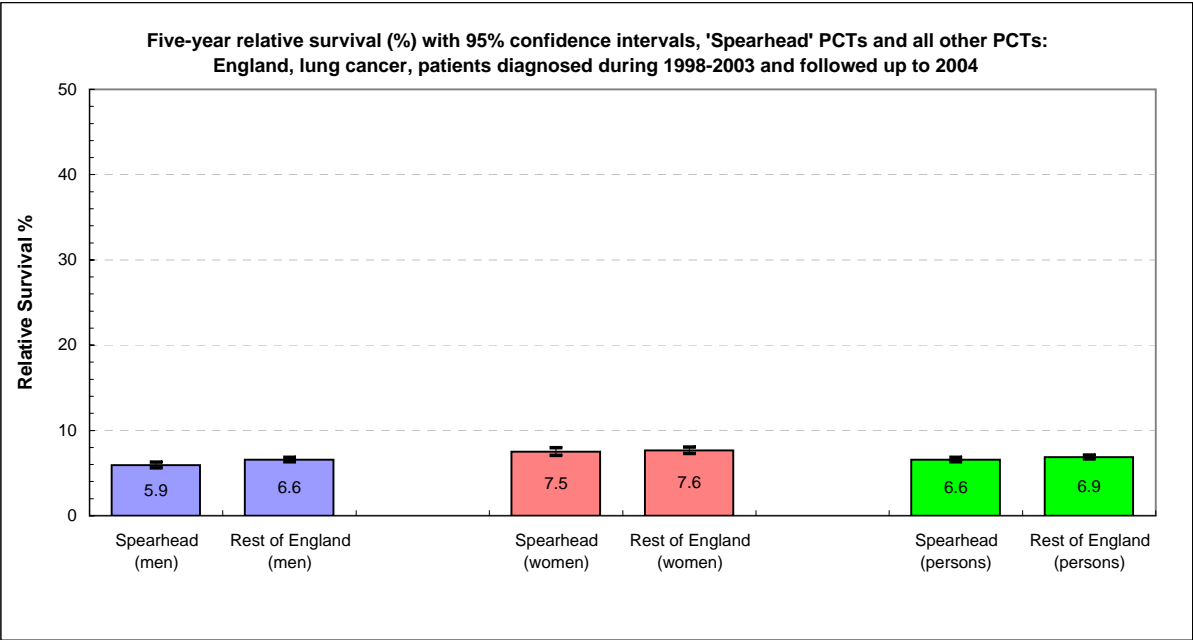
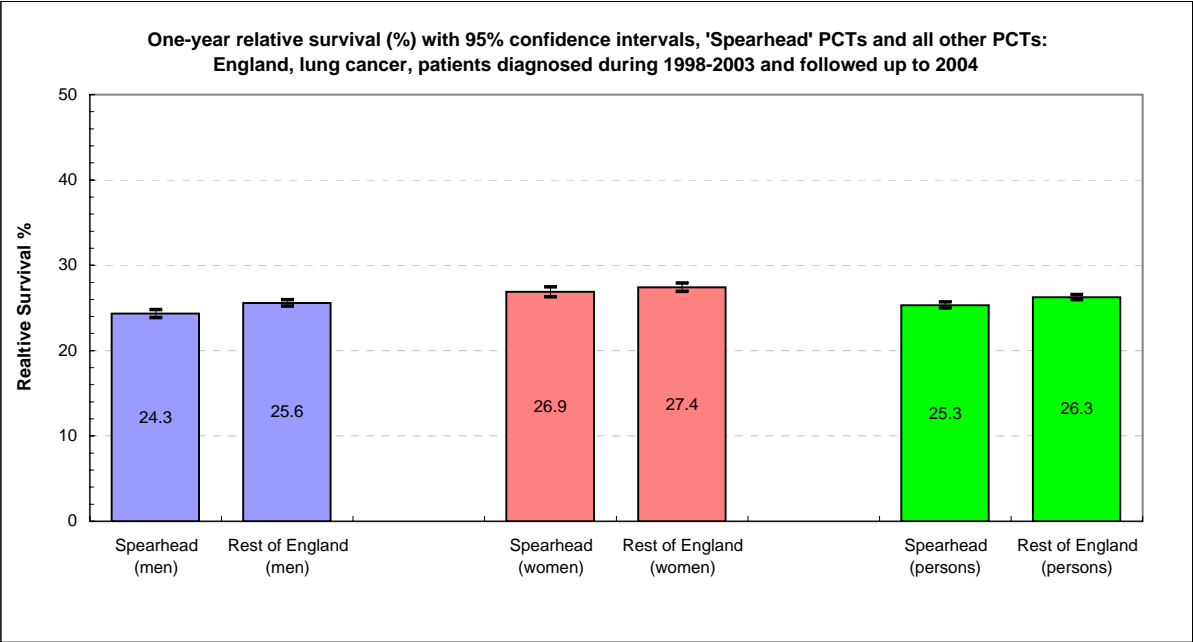
One-year and five-year relative survival (%) with 95% confidence intervals, 'Spearhead' PCTs and all other PCTs:
England, breast cancer, women diagnosed during 1998-2003 & followed up to 2004

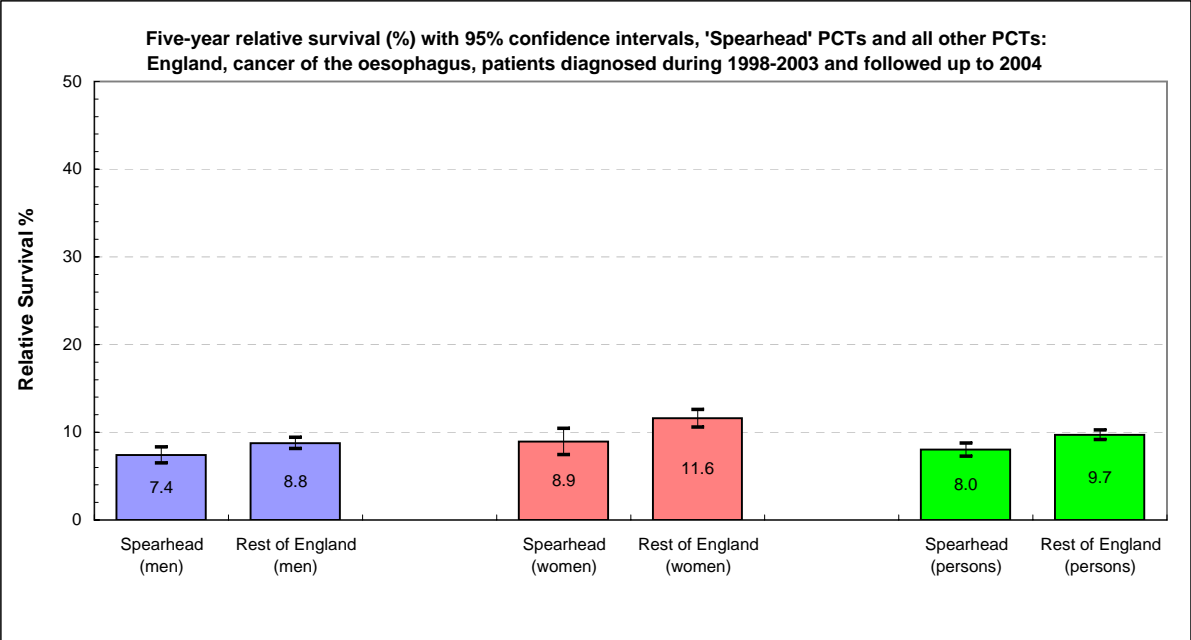
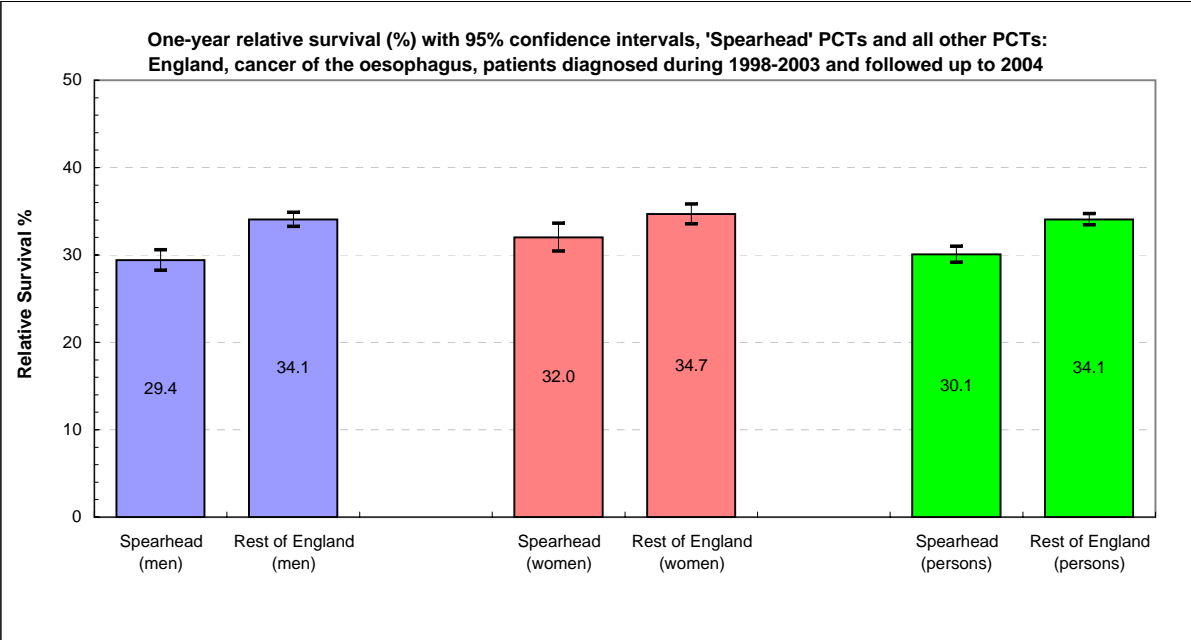


One-year and five-year relative survival (%) with 95% confidence intervals, 'Spearhead' PCTs and all other PCTs: England, cancer of the cervix, women diagnosed during 1998-2003 and followed up to 2004

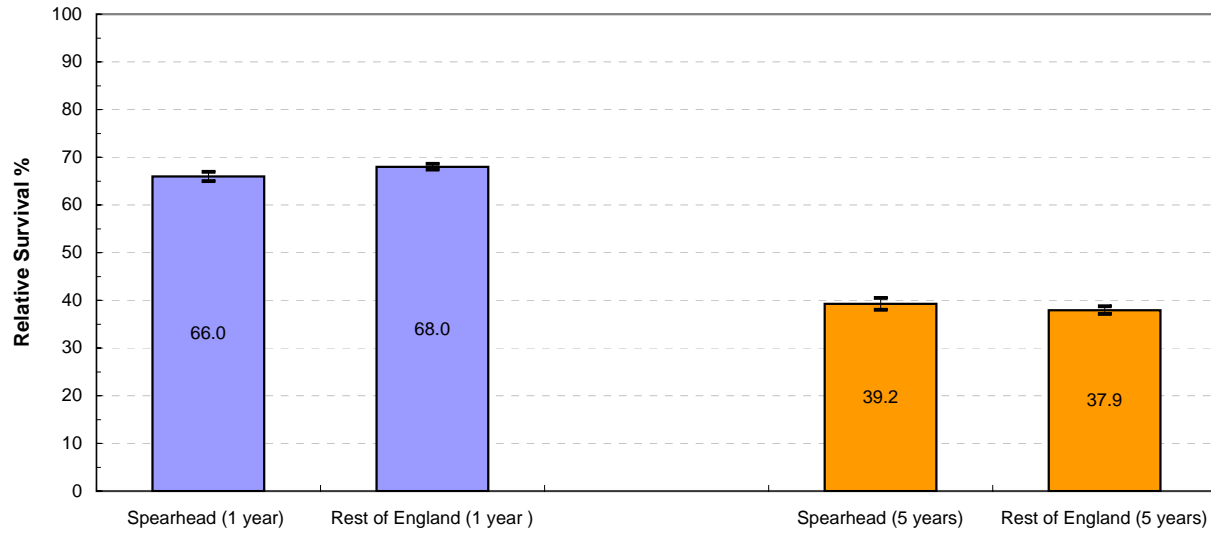




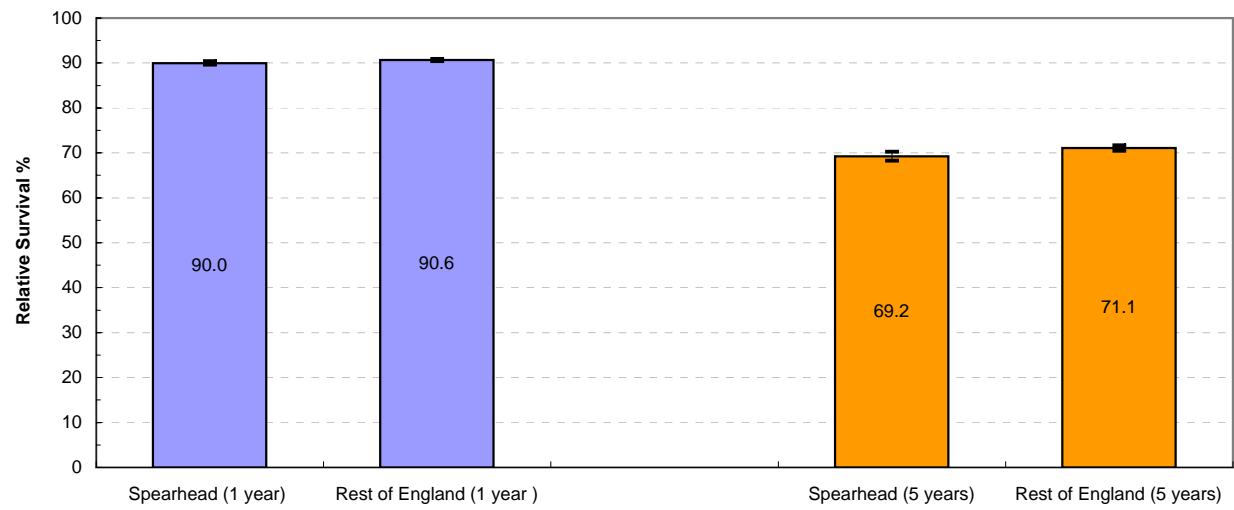


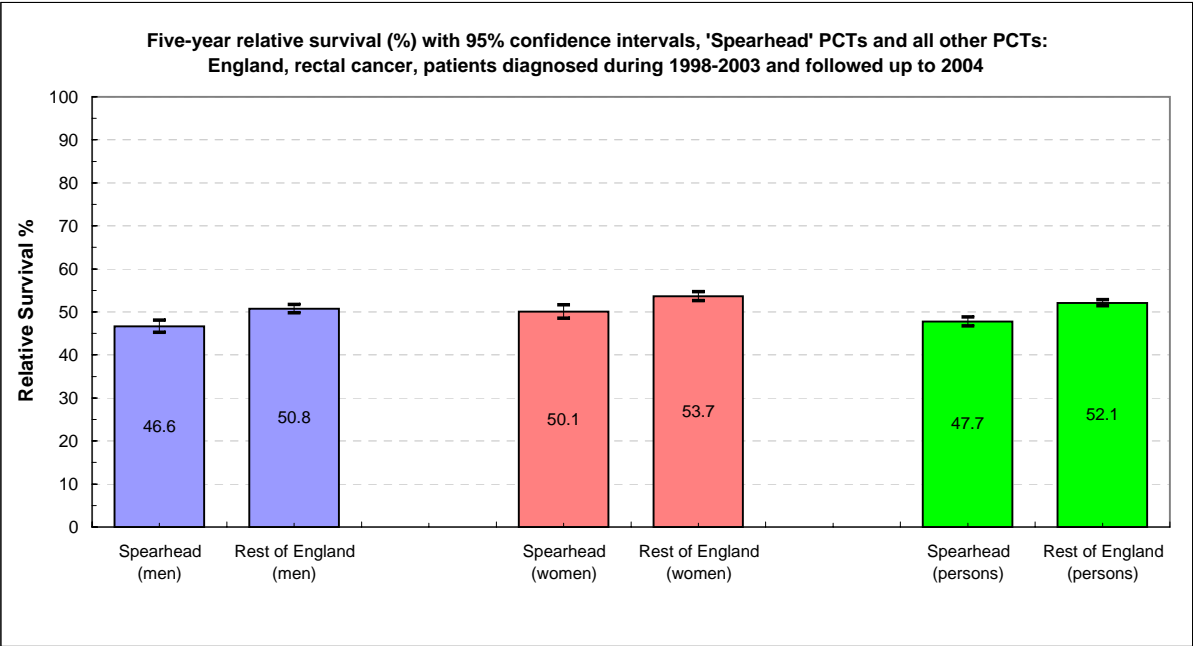
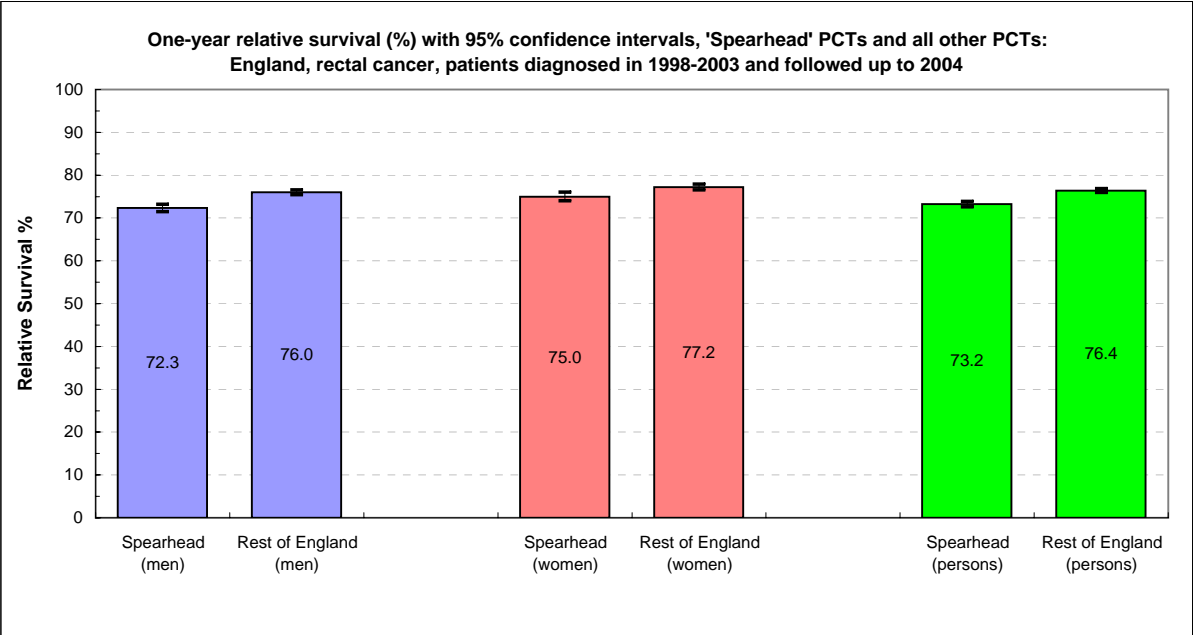


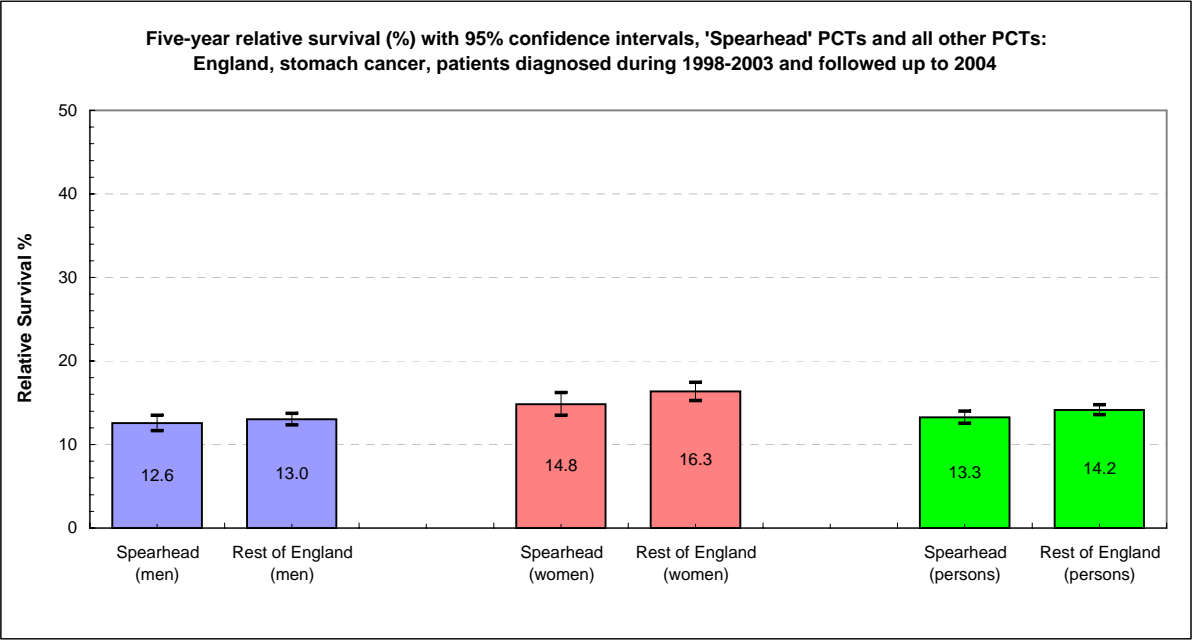
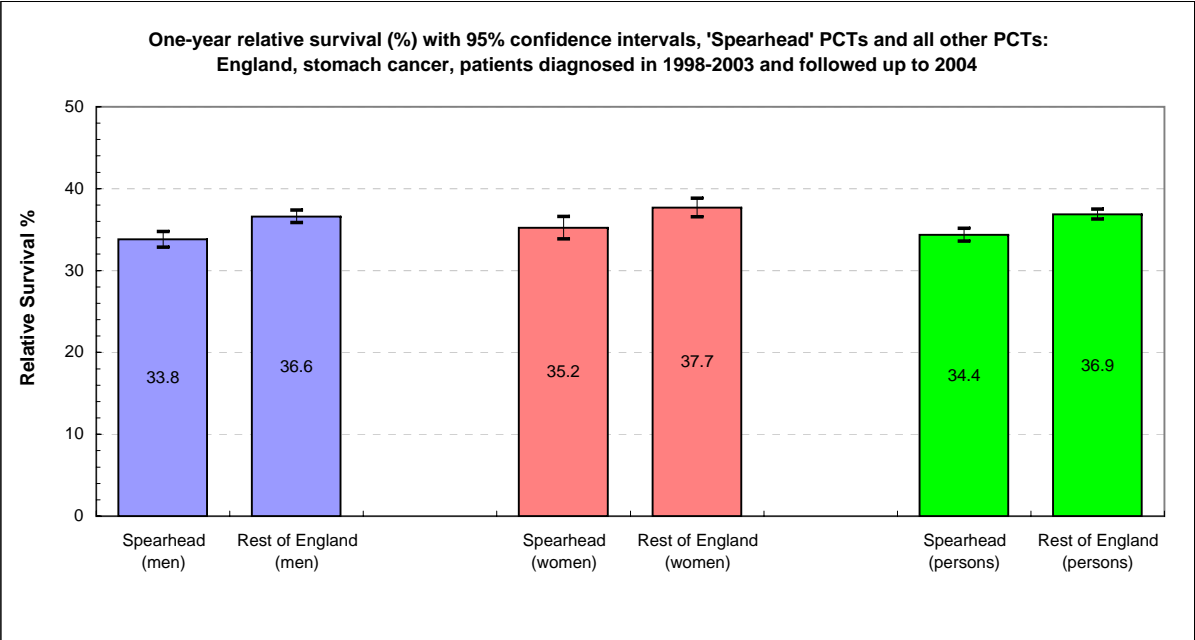
One-year and five-year relative survival (%) with 95% confidence intervals, 'Spearhead' PCTs and all other PCTs:
England, ovarian cancer, women diagnosed during 1998-2003 and followed up to 2004



One-year and five-year relative survival (%) with 95% confidence intervals, 'Spearhead' PCTs and all other PCTs:
England, prostate cancer, men diagnosed during 1998-2003 and followed up to 2004







Cancer patients diagnosed in England in 1998-2003, followed up to 2004; Relative survival using complete approach, regional life tables

Cancer	Sex	Year	Spearhead PCTs					Rest of England					Significance (p-value) of difference in survival	For labels in graphs only:	
			Cases	Deaths	RS	RS_lo	RS_hi	Cases	Deaths	RS	RS_lo	RS_hi		Spearhead (men)	Rest of England (men)
bladder	Males	One	10,789	5,316	77.31	76.46	78.17	24,778	11,922	78.84	78.30	79.39	0.000		
		Five			57.05	55.64	58.47			60.41	59.53	61.29	0.000		
	Females	One	4,513	2,623	66.35	64.89	67.80	9,337	5,266	70.38	69.40	71.37	0.000		Spearhead (women)
		Five			49.06	47.16	50.96			53.63	52.28	54.99	0.000		Rest of England (women)
	Persons	One	15,302	7,939	73.91	73.18	74.64	34,115	17,188	76.38	75.91	76.86	0.000		Spearhead (persons)
		Five			54.97	53.85	56.10			58.58	57.85	59.31	0.000		Rest of England (persons)
breast	Females	One	54,019	12,540	93.45	93.21	93.69	136,340	29,304	94.19	94.05	94.34	0.000		
		Five			78.17	77.61	78.73			79.75	79.41	80.09	0.000		Spearhead (1 year)
cervix	Females	One	5,049	1,707	81.40	80.31	82.49	8,639	2,890	82.17	81.30	83.03	0.281		Rest of England (1 year)
		Five			63.35	61.79	64.90			62.67	61.42	63.93	0.509		Spearhead (5 years)
colon	Males	One	13,828	7,680	66.10	65.24	66.95	32,813	17,690	69.28	68.75	69.82	0.000		Rest of England (5 years)
		Five			47.14	45.81	48.47			48.32	47.49	49.15	0.000		
	Females	One	13,062	7,334	65.86	65.02	66.70	32,585	17,532	68.94	68.43	69.46	0.000		
		Five			47.91	46.73	49.10			49.62	48.87	50.36	0.000		
	Persons	One	26,890	15,014	65.91	65.31	66.50	65,398	35,222	68.99	68.62	69.35	0.000		
		Five			47.41	46.54	48.27			48.92	48.37	49.46	0.000		
lung	Males	One	34,545	31,848	24.33	23.87	24.80	59,478	54,662	25.58	25.21	25.94	0.000		
		Five			5.93	5.59	6.27			6.57	6.30	6.83	0.003		
	Females	One	23,234	21,009	26.88	26.29	27.47	36,750	33,111	27.42	26.93	27.90	0.000		
		Five			7.52	7.07	7.97			7.65	7.27	8.02	0.003		
	Persons	One	57,779	52,857	25.33	24.96	25.69	96,228	87,773	26.27	25.97	26.56	0.000		
		Five			6.56	6.29	6.83			6.87	6.65	7.09	0.003		
oesophagus	Males	One	6,108	5,413	29.42	28.25	30.59	13,909	12,079	34.07	33.27	34.87	0.000		
		Five			7.41	6.50	8.33			8.77	8.13	9.41	0.000		
	Females	One	3,802	3,385	32.03	30.43	33.63	8,213	7,269	34.68	33.55	35.82	0.000		
		Five			8.94	7.43	10.45			11.59	10.60	12.58	0.000		
	Persons	One	9,910	8,798	30.09	29.17	31.00	22,122	19,348	34.07	33.43	34.71	0.000		
		Five			8.02	7.28	8.77			9.71	9.17	10.25	0.000		
ovary	Females	One	8,655	4,882	65.95	64.99	66.91	20,851	12,139	67.96	67.36	68.56	0.000		
		Five			39.23	37.97	40.49			37.91	37.10	38.71	0.082		
prostate	Males	One	37,335	13,202	89.98	89.57	90.38	96,451	31,557	90.64	90.40	90.89	0.005		
		Five			69.20	68.21	70.20			71.05	70.47	71.63	0.002		
rectum	Males	One	11,925	6,298	72.32	71.44	73.20	24,111	11,927	75.97	75.39	76.56	0.000		
		Five			46.64	45.22	48.05			50.77	49.81	51.74	0.000		
	Females	One	7,715	3,990	74.99	73.98	75.99	16,863	8,208	77.19	76.53	77.85	0.000		
		Five			50.09	48.53	51.66			53.68	52.64	54.72	0.000		
	Persons	One	19,640	10,288	73.21	72.56	73.87	40,974	20,135	76.40	75.97	76.83	0.000		
		Five			47.74	46.72	48.77			52.12	51.42	52.82	0.000		
stomach	Males	One	9,525	8,101	33.80	32.84	34.76	16,217	13,733	36.60	35.85	37.36	0.000		
		Five			12.56	11.63	13.50			13.02	12.32	13.73	0.021		
	Females	One	5,241	4,433	35.23	33.85	36.61	8,534	7,200	37.69	36.57	38.80	0.000		
		Five			14.84	13.49	16.19			16.35	15.25	17.45	0.021		
	Persons	One	14,766	12,534	34.35	33.57	35.13	24,751	20,933	36.88	36.27	37.50	0.000		
		Five			13.26	12.52	14.00			14.15	13.57	14.74	0.021		