



Public Health
England

Protecting and improving the nation's health

National Cancer Intelligence Network

Trends in incidence and outcome for haematological cancers in England: 2001-2010

About Public Health England

Public Health England exists to protect and improve the nation's health and wellbeing, and reduce health inequalities. It does this through world-class science, knowledge and intelligence, advocacy, partnerships and the delivery of specialist public health services. PHE is an operationally autonomous executive agency of the Department of Health.

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The intelligence networks

Public Health England operates a number of intelligence networks, which work with partners to develop world-class population health intelligence to help improve local, national and international public health systems.

National Cancer Intelligence Network

The National Cancer Intelligence Network (NCIN) is a UK-wide initiative, working to drive improvements in cancer awareness, prevention, diagnosis and clinical outcomes by improving and using the information collected about cancer patients for analysis, publication and research.

National Cardiovascular Intelligence Network

The National Cardiovascular Intelligence Network (NCVIN) analyses information and data and turns it into meaningful timely health intelligence for commissioners, policy makers, clinicians and health professionals to improve services and outcomes.

National Child and Maternal Health Intelligence Network

The National Child and Maternal Health Intelligence Networks (NCMHIN) provides information and intelligence to improve decision-making for high quality, cost effective services. Their work supports policy makers, commissioners, managers, regulators, and other health stakeholders working on children's, young people's and maternal health.

National Mental Health Intelligence Network

The National Mental Health Intelligence Network (NMHIN) is a single shared network in partnership with key stakeholder organisations. The Network seeks to put information and intelligence into the hands of decision makers to improve mental health and wellbeing.

National End of Life Care Intelligence Network

The National End of Life Care Intelligence Network (NEoLCIN) aims to improve the collection and analysis of information related to the quality, volume and costs of care provided by the NHS, social services and the third sector to adults approaching the end of life. This intelligence will help drive improvements in the quality and productivity of services.

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Introduction

This is the second report to present national haematological cancer analyses at individual disease group level. Many haematological malignancies are rare and as such are difficult to analyse in a meaningful way at a sub-national level. This report provides an opportunity to look at incidence, mortality and survival for these and other haematological malignancies. The incidence and mortality data reported cover the period 2001 to 2010. The survival analyses cover a range of different time periods commencing in 2000 in order to allow survival trends to be identified. Long term estimates of survival based on complete follow-up of patients means restricting information to cases diagnosed several years ago. To enable a more relevant recent analysis we have used the period approach. This limits the analysis to a recent time window (the 'period' of interest) and allows inclusion of individuals whose survival spans the period or commences during the period. More details of the methods employed are given in [Appendix 1](#). These data have been quality assured against a number of existing data sources as far as is possible. However, given there are no other national analyses available for many of these disease groups, the nearest equivalents have been used.

Haematological malignancies are diseases originating in the bone marrow and lymph nodes and include leukaemias, lymphomas and myeloma. They are a very diverse group of diseases affecting people across the whole life course, but with their greatest incidence among the elderly. The prognosis and responsiveness to treatment of these conditions also varies very widely, and over the period covered in this report the positive impact of several new forms of treatment are clearly apparent.

The aetiology of most haematological malignancies is not yet known. Ionising radiation, exposure to chemicals and dusts, smoking, industrial exposures including benzene, viral infections, genetic predisposition and Down's syndrome are associated with an increased risk for one or more of these diseases, but for most patients there is as yet no identifiable cause for their disease.

Haematological malignancies accounted for 8.4% of all malignant disease (excluding non-melanoma skin cancer) diagnosed in England in the years 2001 to 2010.

The diversity of haematological malignancies presents problems for the classification of these diseases for cancer registries. The categories available for these diseases within the 10th edition of the International Classification of Disease (ICD-10) are not a good fit to the current biological and clinical understanding of these cancers, and as a consequence reports have often grouped dissimilar disease together (for example presenting outcomes for all 'leukaemia'). Ongoing improvements to cancer registration in the UK will allow refinement of these categories, but for this report, haematological malignancies have been described in disease groups by combining ICD-10 codes where relevant (appendix 2). Information has not been presented in this report on some conditions which have historically been considered of 'borderline' behaviour: myelodysplastic syndromes and myeloproliferative neoplasms. Although these are recorded by cancer registries ascertainment is known to be incomplete.

Key messages

Population-based incidence rates (as estimated by cancer registrations) rose over the period 2001-2010 for some haematological cancers: Hodgkin lymphoma, non-Hodgkin lymphoma and myeloma. There are no haematological cancers for which incidence rates were in decline.

Registration rates for haematological cancers are subject to change as a consequence of improvements in the ascertainment of new cases and developments in diagnosis and classification of disease; therefore not all observed changes may represent true differences in underlying incidence.

Population-based mortality rates fell over the period 2001-2010 for some haematological cancers: acute lymphoblastic leukaemia, chronic myeloid leukaemia, non-Hodgkin lymphoma and myeloma.

Relative survival improved for individuals in specific age groups who were diagnosed between 2000 and 2010 for a number of haematological cancers: acute lymphoblastic leukaemia (0-14 years males and females; 15-64 years males), acute myeloid leukaemia (15-64 years), chronic myeloid leukaemia, non-Hodgkin lymphoma, and myeloma.

For the most commonly encountered forms of leukaemia in older adult life (65+), acute myeloid leukaemia and chronic lymphocytic leukaemia, there was no evidence of significant change in the outcome for patients diagnosed and registered over this time period.

1. All haematological malignancies

When considered overall, age-standardised rates of incidence for haematological malignancies have risen from 2001-2010 in both men and women. Part of this trend is a consequence of improved ascertainment of these cancers particularly from 2008 onwards. Conversely age-standardised mortality rates have fallen over this period, largely as a consequence of improvements in the management of some of the individual contributing haematological cancers.

Trends in incidence and mortality (2001-2010)

Figure 1-1. Age-standardised incidence and mortality rates for haematological malignancies in the period 2001-2010 for England for males

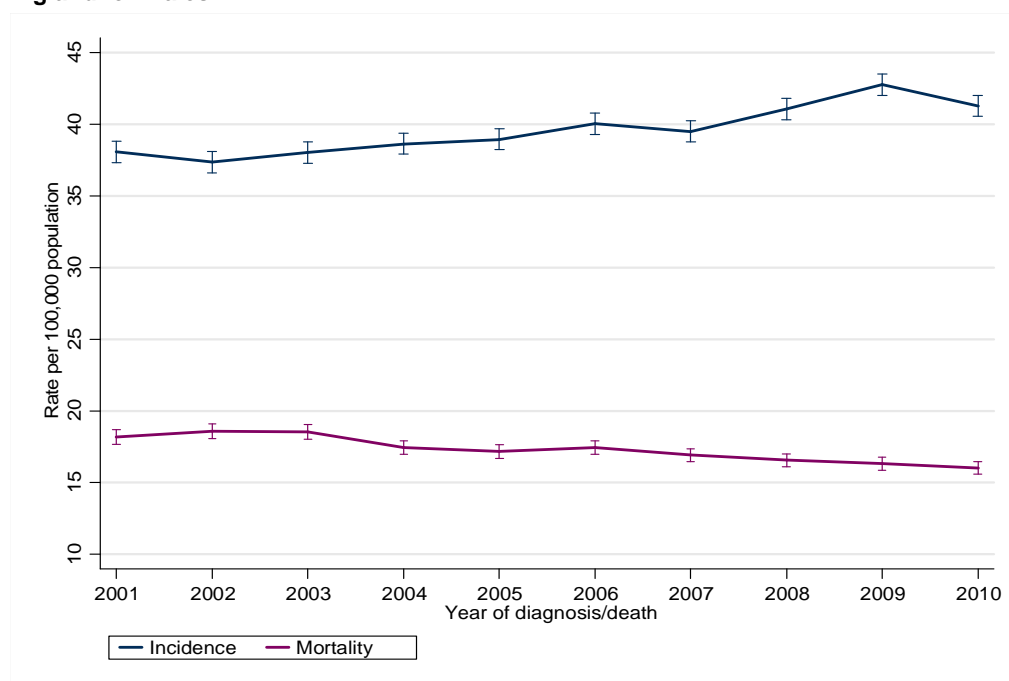


Table 1-1. Age-standardised incidence and mortality rates for haematological malignancies in the period 2001-2010 for England for males

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001	10325	38.1	37.3 38.8	5157	18.2	17.7 18.7
2002	10282	37.4	36.6 38.1	5366	18.6	18.1 19.1
2003	10635	38.0	37.3 38.8	5445	18.5	18.0 19.0
2004	10938	38.6	37.9 39.4	5208	17.4	17.0 17.9
2005	11176	39.0	38.2 39.7	5244	17.2	16.7 17.6
2006	11643	40.1	39.3 40.8	5396	17.4	17.0 17.9
2007	11673	39.5	38.8 40.3	5405	16.9	16.5 17.4
2008	12388	41.1	40.3 41.8	5427	16.6	16.1 17.0
2009	13152	42.8	42.0 43.5	5471	16.3	15.9 16.8
2010	12797	41.3	40.5 42.0	5453	16.0	15.6 16.5

*the increased incidence observed from 2008 for males and females was largely due to increases in ascertainment of cases in some of the former regional cancer registries. Please see note in Appendix 2 for full description of changes

Figure 1-2. Age-standardised incidence and mortality rates for haematological malignancies in the period 2001-2010 for England for females

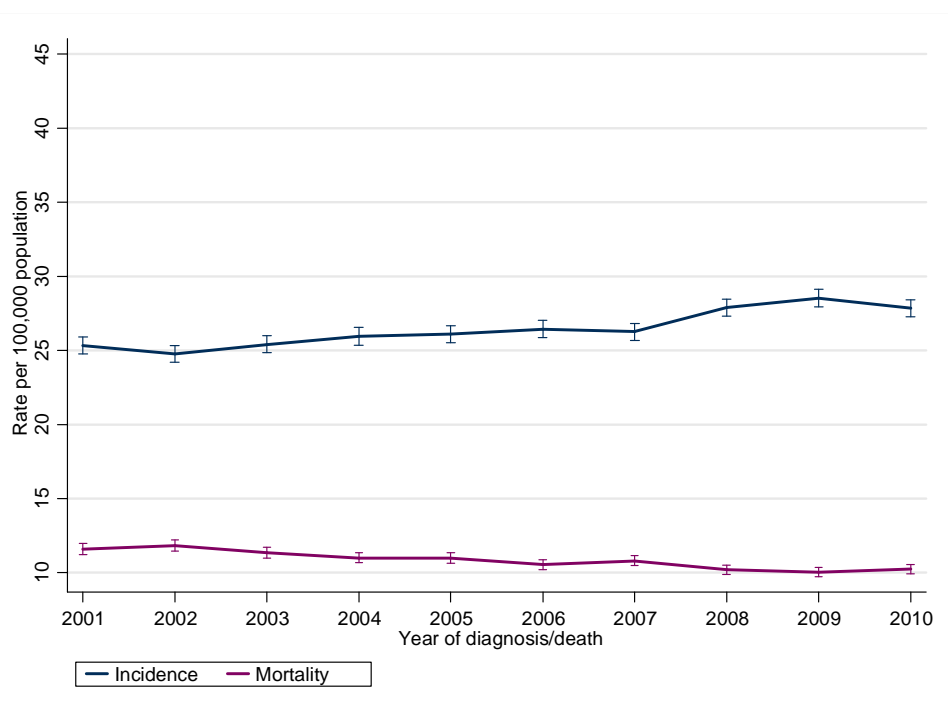


Table 1-2. Age-standardised incidence and mortality rates for haematological malignancies in the period 2001-2010 for England for females

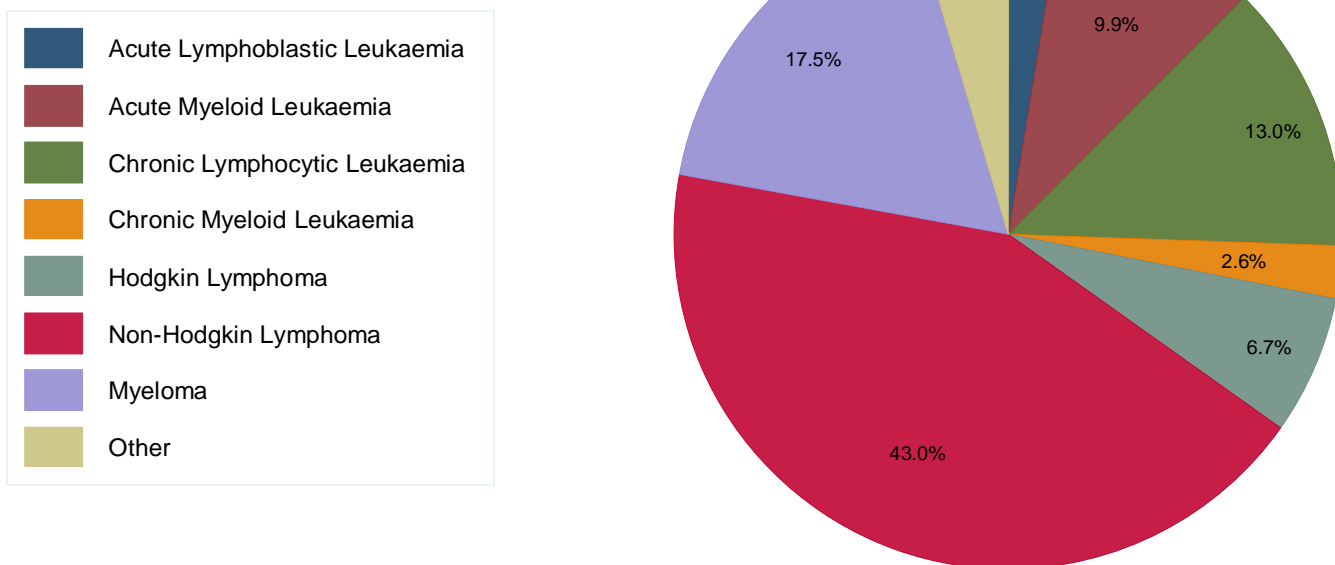
Year	Incidence				Mortality			
	Cases*	ASR	95% CI		Deaths*	ASR	95% CI	
2001	8636	25.3	24.8	25.9	4509	11.6	11.2	12.0
2002	8462	24.8	24.2	25.3	4657	11.8	11.4	12.2
2003	8704	25.4	24.8	26.0	4588	11.3	11.0	11.7
2004	8917	25.9	25.4	26.5	4453	11.0	10.6	11.3
2005	9086	26.1	25.5	26.7	4460	11.0	10.6	11.3
2006	9268	26.4	25.9	27.0	4417	10.5	10.2	10.9
2007	9264	26.3	25.7	26.8	4583	10.8	10.4	11.1
2008	10026	27.9	27.3	28.5	4407	10.2	9.9	10.5
2009	10302	28.5	28.0	29.1	4405	10.0	9.7	10.4
2010	10085	27.8	27.3	28.4	4582	10.2	9.9	10.5

*the increased incidence observed from 2008 for males and females was largely due to increases in ascertainment of cases in some of the former regional cancer registries. Please see note in Appendix 2 for full description of changes

Proportion of new cases of haematological malignancy by disease group in males (2008-2010)

Non-Hodgkin lymphoma is the largest disease group in terms of number of new cases, accounting for over 40% of all haematological malignancies in both men and women. Myeloma is the second most commonly registered haematological cancer, accounting for 17% of all new haematological malignancies annually. Acute myeloid leukaemia and chronic lymphocytic leukaemia each account for about 10% of all haematological malignancies in both sexes, with acute lymphocytic leukaemia and chronic myeloid leukaemia together contributing a further 5% of the total.

Figure 1-3. Proportion of new cases of haematological malignancy by disease group in males (2008-2010)



Proportion of new cases of haematological malignancies by disease group in females (2008-2010)

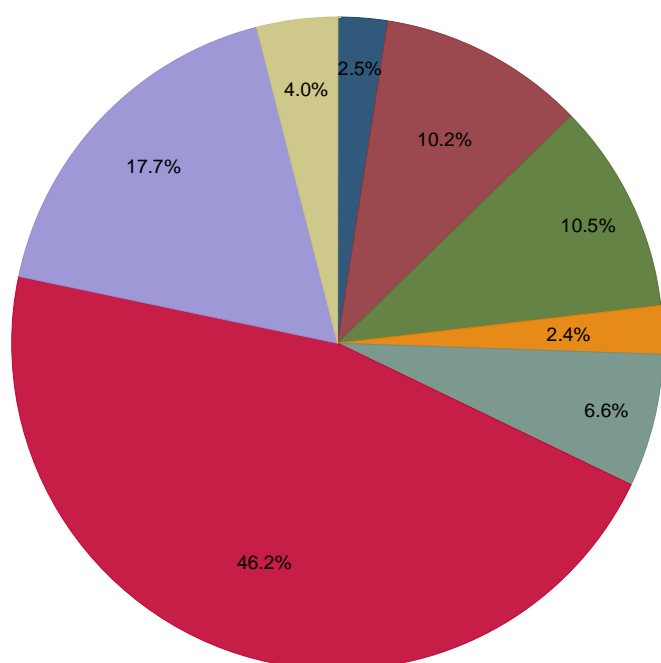
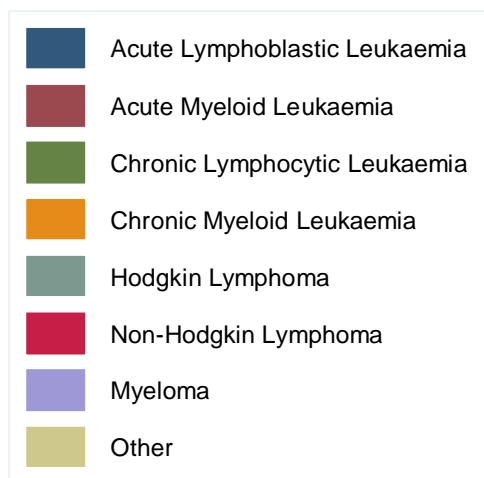


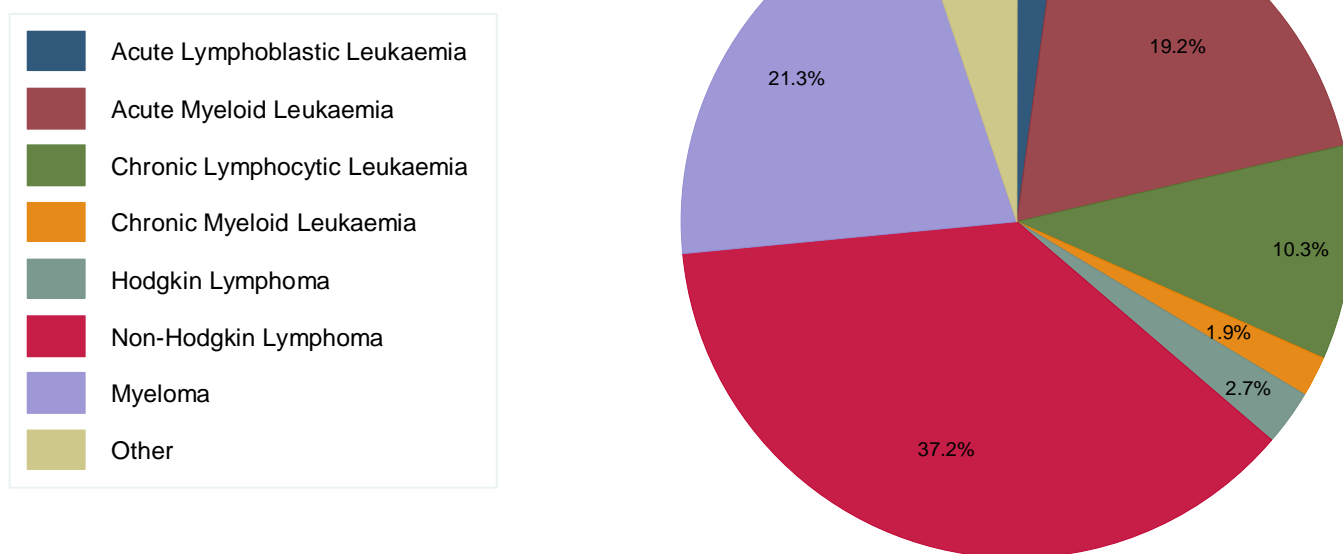
Figure 1-4. Proportion of new cases of haematological malignancies by disease group in females (2008-2010)



Proportion of deaths from haematological malignancy by disease group in males (2008-2010)

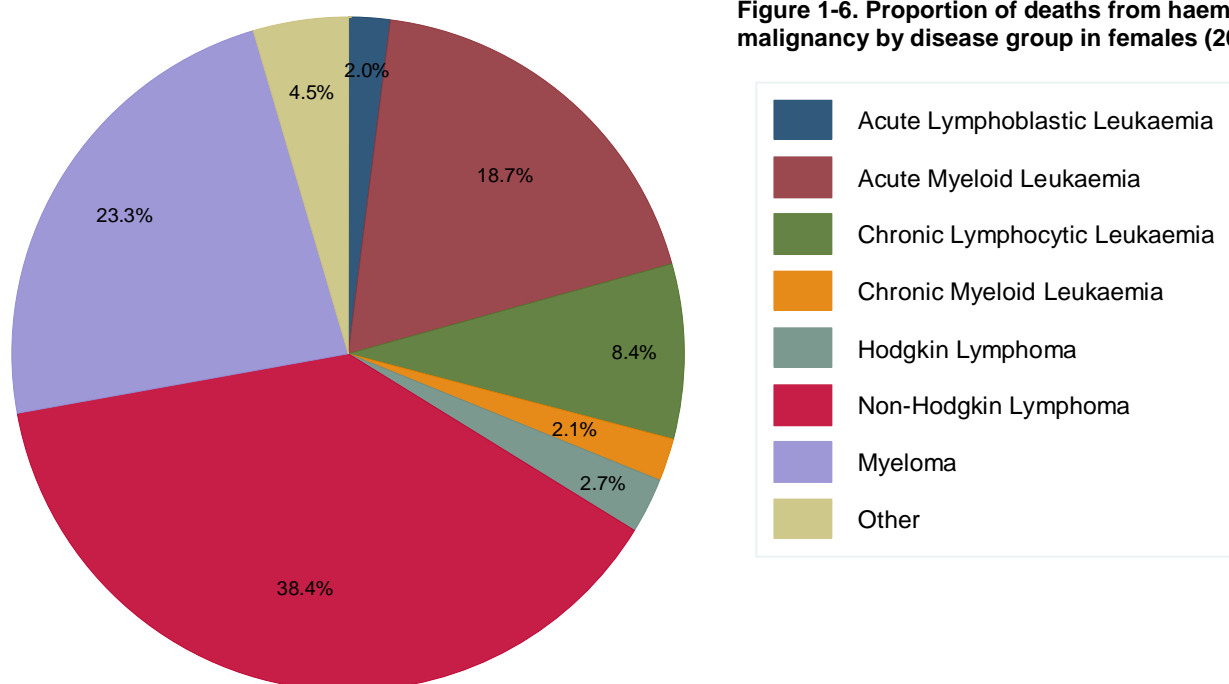
The contribution of individual haematological cancers to the overall numbers of deaths varies slightly from that seen for disease incidence as a consequence of differences in the prognosis for these cancers. Around 38% of deaths are attributed to non-Hodgkin lymphoma, making up the largest proportion of deaths. Disease groups with a poorer overall outcome such as acute myeloid leukaemia and myeloma make up a larger proportion of all deaths than they do of incidence. Hodgkin lymphoma, which has a much better prognosis, makes up only 3% of deaths in this time period.

Figure 1-5. Proportion of deaths from haematological malignancy by disease group in males (2008-2010)



Proportion of deaths from haematological malignancy by disease group in females (2008-2010)

Figure 1-6. Proportion of deaths from haematological malignancy by disease group in females (2008-2010)



Age-standardised incidence by disease group and sex

Table 1-3. Age-standardised incidence rates for males for haematological malignancies diagnosed in the period 2008-2010 by diagnostic group

Site	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
Acute Lymphoblastic Leukaemia	329	1.4	1.3 1.5	111	0.4	0.4 0.5
Acute Myeloid Leukaemia	1267	4.0	3.9 4.2	1065	3.2	3.1 3.3
Chronic Lymphoid Leukaemia	1666	5.2	5.0 5.3	566	1.6	1.5 1.7
Chronic Myeloid Leukaemia	328	1.1	1.0 1.2	107	0.3	0.3 0.4
Hodgkin Lymphoma	860	3.2	3.1 3.3	146	0.5	0.4 0.5
Non-Hodgkin Lymphoma	5499	17.9	17.7 18.2	2024	6.1	5.9 6.2
Myeloma	2242	7.0	6.8 7.1	1161	3.4	3.3 3.5
Other	588	1.9	1.8 2.0	271	0.8	0.7 0.8
All haematological malignancies	12779	41.7	41.3 42.1	5450	16.3	16.0 16.6

Table 1-4. Age-standardised incidence rates for females for haematological malignancies diagnosed in the period 2008-2010 by diagnostic group

Site	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
Acute Lymphoblastic Leukaemia	250	1.1	1.0 1.2	88	0.3	0.3 0.3
Acute Myeloid Leukaemia	1038	2.8	2.7 2.9	863	2.1	2.0 2.2
Chronic Lymphoid Leukaemia	1060	2.6	2.5 2.7	369	0.7	0.6 0.7
Chronic Myeloid Leukaemia	243	0.7	0.7 0.8	91	0.2	0.2 0.2
Hodgkin Lymphoma	669	2.4	2.3 2.5	111	0.3	0.3 0.3
Non-Hodgkin Lymphoma	4680	12.9	12.7 13.2	1706	3.9	3.8 4.0
Myeloma	1792	4.5	4.4 4.6	1031	2.3	2.2 2.4
Other	407	1.0	1.0 1.1	206	0.4	0.4 0.4
All haematological malignancies	10138	28.1	27.7 28.4	4465	10.1	9.9 10.3

Table 1-5. Age-standardised incidence rates for persons for haematological malignancies diagnosed in the period 2008-2010 by diagnostic group

Site	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
Acute Lymphoblastic Leukaemia	579	1.2	1.2 1.3	199	0.4	0.3 0.4
Acute Myeloid Leukaemia	2305	3.4	3.3 3.5	1928	2.7	2.6 2.7
Chronic Lymphoid Leukaemia	2726	3.9	3.8 4.0	935	1.1	1.1 1.2
Chronic Myeloid Leukaemia	571	0.9	0.9 1.0	198	0.3	0.2 0.3
Hodgkin Lymphoma	1529	2.8	2.7 2.9	257	0.4	0.4 0.4
Non-Hodgkin Lymphoma	10179	15.4	15.3 15.6	3730	5.0	4.9 5.1
Myeloma	4034	5.7	5.6 5.8	2192	2.8	2.8 2.9
Other	995	1.4	1.4 1.5	477	0.6	0.6 0.6
All haematological malignancies	22917	34.9	34.6 35.2	9915	13.2	13.1 13.4

*3 year average

2. Acute lymphoblastic leukaemia

Acute lymphoblastic leukaemia (ALL) is most common in children, with a higher incidence in males than females. Over the period of this report the age-standardised incidence has not changed while there has been a small decline in the mortality rate in both sexes.

Outcomes for ALL in children improved greatly over the second half of the 20th century. Over the time period reported here continued improvements in survival are apparent in patients aged 0-14 years, with an increase in relative survival at five years among males and females combined from 83% (95% CI: 81-85%) for individuals diagnosed in 2000-03 to 92% (95% CI: 90- 94%) for those diagnosed in 2008-10. The outcome from ALL is strongly influenced by the age at diagnosis, with poorer survival in older teenagers and adults.

Treatment for ALL takes 2-3 years, and involves several drugs and extended stays in hospital. There were several changes in treatment protocols for children during the period 2001-2010. The changes in management included: increasing the length of treatment for boys from two years (standard for girls throughout) to three years; replacing prednisolone with dexamethasone; universal use of mercaptopurine; the phasing out of thioguanine and intensification of treatment both to children with high risk at diagnosis and those slow to respond to initial therapy.

The limited change in survival in adults with ALL over the reported period reflects limited therapeutic advance over this time. During this period allogeneic transplant (cells transplanted from a donor) was increasingly used in selected patients, with some evidence from trials that this was a better treatment option for selected patients. In contrast, autologous transplant (patient's own cells transplanted) was not shown to be beneficial and possibly less successful than conventional treatment, and was used less often in the later years reported.

Chemotherapy for the age group 15-24 changed over this time; patients aged 15-18 began to be treated with children's management protocols in 2003 in the hope that this would improve survival. Evidence accumulated that this was an improvement in treatment, and the children's protocol was introduced for young adults age 19-24 from 2007.

Trends in incidence and mortality (males)

Figure 2-1. Age-standardised incidence and mortality rates for acute lymphoblastic leukaemia in males in the period 2001-2010 in England (3 year moving average)

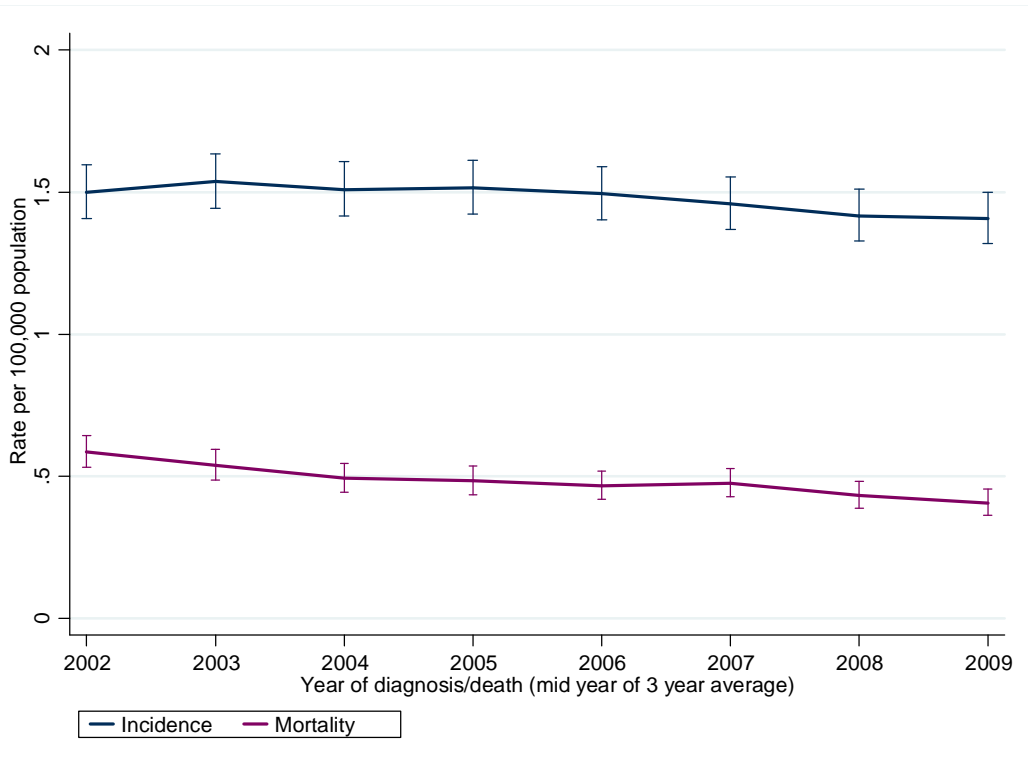


Table 2-1. Age-standardised incidence and mortality rates for acute lymphoblastic leukaemia in males in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	337	1.5	1.4 1.6	148	0.6	0.5 0.6
2002-2004	344	1.5	1.4 1.6	139	0.5	0.5 0.6
2003-2005	341	1.5	1.4 1.6	129	0.5	0.4 0.5
2004-2006	345	1.5	1.4 1.6	126	0.5	0.4 0.5
2005-2007	342	1.5	1.4 1.6	122	0.5	0.4 0.5
2006-2008	335	1.5	1.4 1.6	125	0.5	0.4 0.5
2007-2009	328	1.4	1.3 1.5	116	0.4	0.4 0.5
2008-2010	329	1.4	1.3 1.5	111	0.4	0.4 0.5

*3 year moving average

Trends in incidence and mortality (females)

Figure 2-2. Age-standardised incidence and mortality rates for acute lymphoblastic leukaemia in females in the period 2001-2010 in England (3 year moving average)

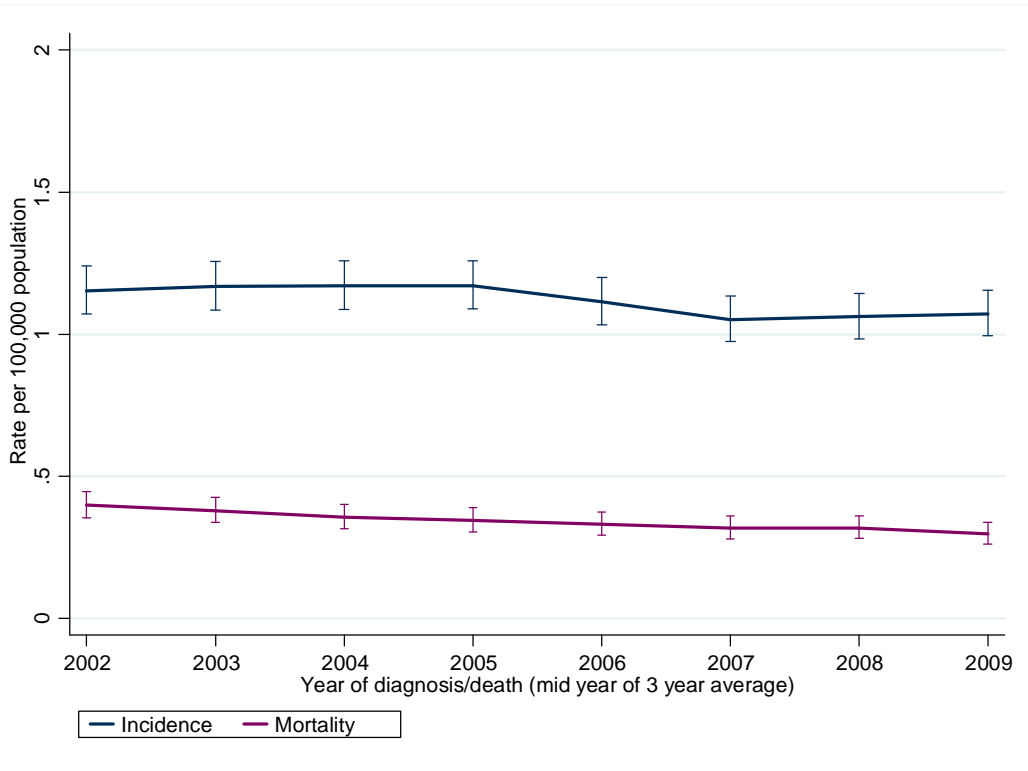


Table 2-2. Age-standardised incidence and mortality rates for acute lymphoblastic leukaemia in females in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	261	1.2	1.1 1.2	110	0.4	0.4 0.4
2002-2004	263	1.2	1.1 1.3	108	0.4	0.3 0.4
2003-2005	265	1.2	1.1 1.3	103	0.4	0.3 0.4
2004-2006	266	1.2	1.1 1.3	100	0.3	0.3 0.4
2005-2007	254	1.1	1.0 1.2	97	0.3	0.3 0.4
2006-2008	243	1.1	1.0 1.1	93	0.3	0.3 0.4
2007-2009	246	1.1	1.0 1.1	94	0.3	0.3 0.4
2008-2010	250	1.1	1.0 1.2	88	0.3	0.3 0.3

*3 year moving average

Trends in survival (males)

Figure 2-3. Trends in relative survival rates for acute lymphoblastic leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

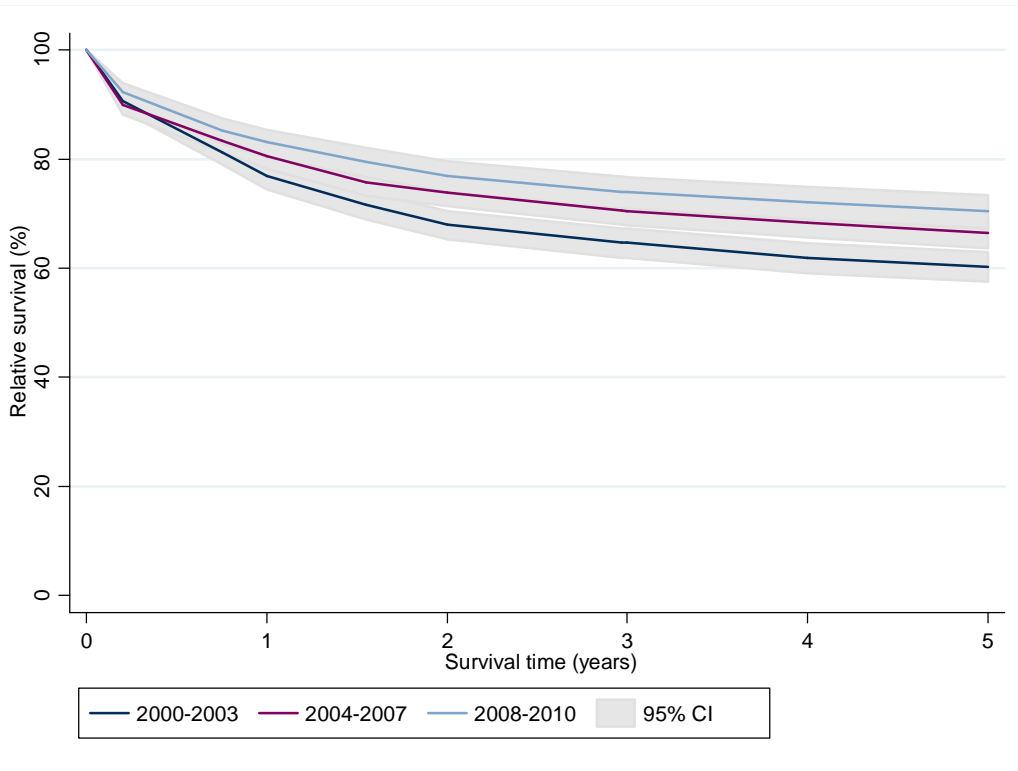


Table 2-3. Trends in relative survival rates for acute lymphoblastic leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010						
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths
1	76.9	74.5	79.2	1389	326	80.5	78.2	82.6	1394	277	83.1	80.4	85.4	1040	178
2	68.0	65.3	70.5	1389	447	73.9	71.4	76.3	1394	369	76.9	74.0	79.6	1040	242
3	64.7	61.9	67.3	1389	492	70.5	67.9	73.0	1394	418	73.9	70.9	76.7	1040	276
4	61.9	59.1	64.5	1389	529	68.3	65.6	70.9	1394	448	72.0	68.9	74.9	1040	295
5	60.3	57.5	63.0	1389	550	66.4	63.7	69.0	1394	474	70.5	67.3	73.4	1040	313

Trends in survival (females)

Figure 2-4. Trends in relative survival rates for acute lymphoblastic leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

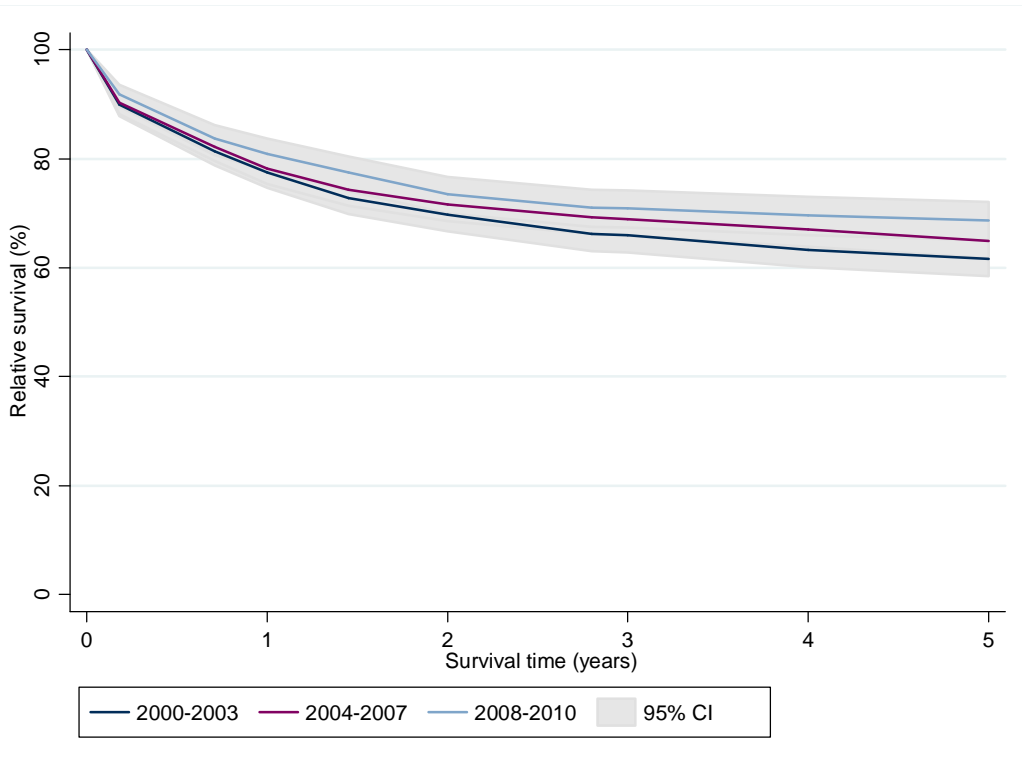


Table 2-4. Trends in relative survival rates for acute lymphoblastic leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010			
	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths
1	77.5	74.7 - 80.0	1039	239	78.2	75.4 - 80.7	1030	228	81.0	77.8 - 83.7	774	149
2	69.7	66.7 - 72.6	1039	319	71.6	68.6 - 74.4	1030	299	73.5	70.0 - 76.7	774	204
3	66.0	62.8 - 68.9	1039	359	69.0	65.9 - 71.9	1030	327	71.0	67.4 - 74.3	774	225
4	63.3	60.1 - 66.3	1039	385	67.0	63.9 - 69.9	1030	348	69.7	66.0 - 73.0	774	236
5	61.6	58.4 - 64.7	1039	403	65.0	61.8 - 67.9	1030	370	68.8	65.1 - 72.1	774	244

Trends in survival by age (males)

Figure 2-5. Trends in relative survival rates for acute lymphoblastic leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

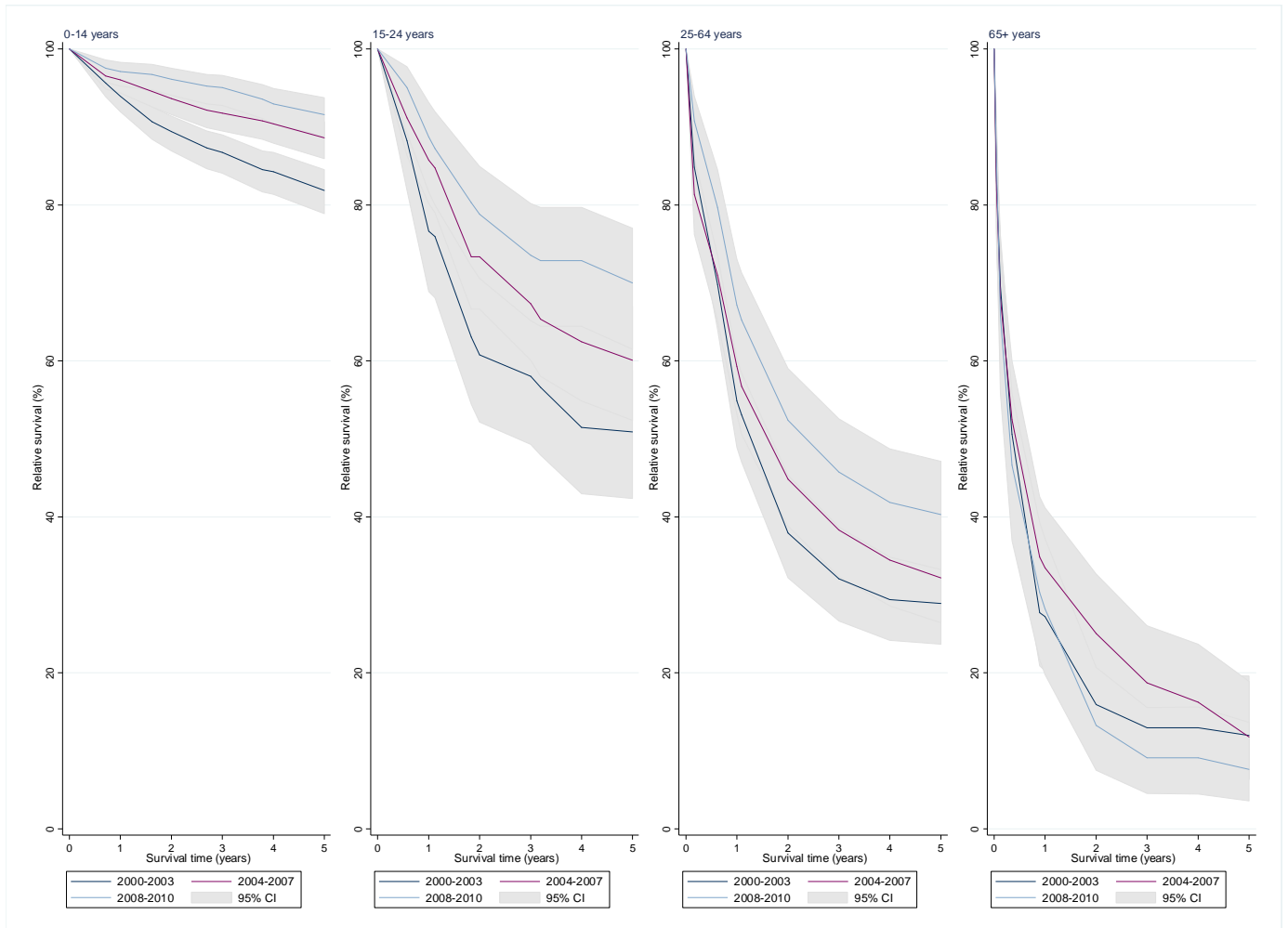


Table 2-5. Trends in relative survival rates for acute lymphoblastic leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
0 - 14 years	1	94.0	92.0	95.5	856	44	96.1	94.3	97.3	811	28	97.2	95.3	98.3	636	15
	2	89.4	86.9	91.4	856	78	93.7	91.6	95.3	811	45	96.2	94.1	97.6	636	20
	3	86.8	84.1	89.0	856	97	91.8	89.5	93.6	811	59	95.0	92.7	96.6	636	26
	4	84.3	81.4	86.7	856	115	90.4	88.0	92.4	811	69	93.0	90.4	94.9	636	36
	5	81.9	78.9	84.5	856	132	88.6	86.0	90.7	811	82	91.6	88.9	93.8	636	43
15 - 24 years	1	76.7	68.9	82.8	171	34	85.8	80.2	89.9	228	29	88.8	81.7	93.2	151	14
	2	60.8	52.1	68.4	171	55	73.4	66.6	79.0	228	53	78.8	70.6	85.0	151	27
	3	58.0	49.3	65.7	171	59	67.4	60.1	73.6	228	63	73.5	65.1	80.2	151	35
	4	51.5	43.0	59.4	171	69	62.5	54.9	69.1	228	70	72.9	64.5	79.7	151	36
	5	50.9	42.3	58.8	171	70	60.1	52.4	67.1	228	73	70.1	61.5	77.1	151	40
25 - 64 years	1	54.9	48.9	60.5	296	130	59.3	53.2	64.9	284	112	67.2	60.3	73.1	226	70
	2	37.9	32.2	43.5	296	178	44.9	38.8	50.7	284	150	52.4	45.3	59.0	226	100
	3	32.0	26.7	37.5	296	195	38.3	32.4	44.2	284	166	45.7	38.7	52.5	226	113
	4	29.4	24.2	34.8	296	203	34.4	28.6	40.3	284	176	41.9	34.9	48.8	226	120
	5	28.9	23.7	34.3	296	205	32.2	26.4	38.1	284	181	40.3	33.3	47.2	226	123
65+ years	1	27.2	20.3	34.5	161	118	33.5	25.9	41.2	164	108	28.2	19.8	37.2	107	79
	2	16.0	10.5	22.5	161	136	25.0	18.0	32.6	164	121	13.3	7.5	20.7	107	95
	3	13.0	7.9	19.4	161	141	18.7	12.3	26.0	164	130	9.1	4.5	15.5	107	102
	4	13.0	7.7	19.7	161	142	16.2	10.0	23.6	164	133	9.0	4.5	15.6	107	103
	5	12.0	6.4	19.6	161	143	11.8	6.4	18.9	164	138	7.6	3.6	13.6	107	107

Trends in survival by age (females)

Figure 2-6. Trends in relative survival rates for acute lymphoblastic leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

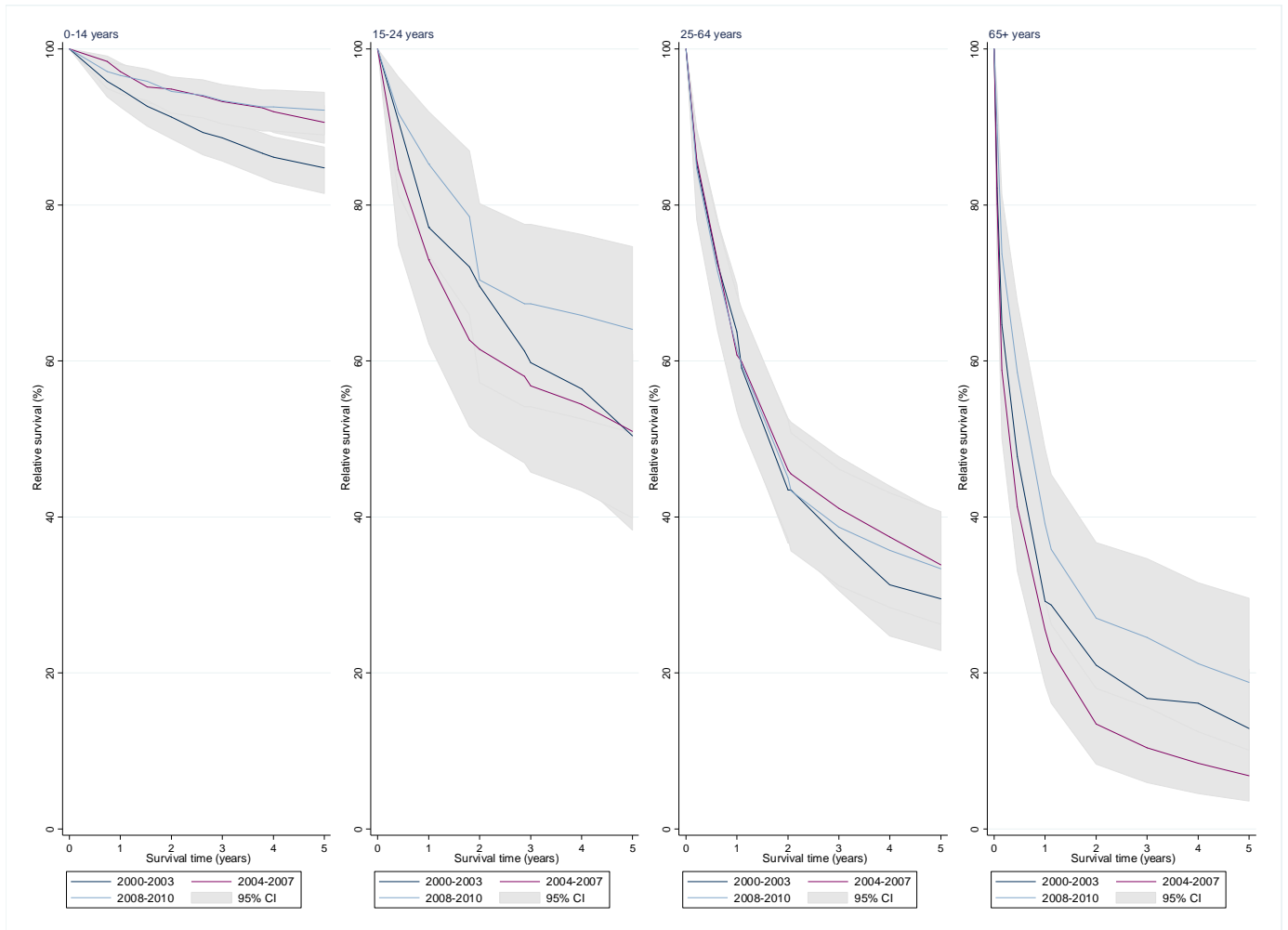


Table 2-6. Trends in relative survival rates for acute lymphoblastic leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
0 - 14 years	1	94.8	92.6	96.4	656	29	97.1	95.4	98.2	643	16	96.6	94.3	98.0	522	14
	2	91.3	88.6	93.3	656	49	94.8	92.6	96.4	643	29	94.6	91.8	96.4	522	22
	3	88.6	85.6	91.0	656	64	93.2	90.8	95.0	643	38	93.3	90.4	95.4	522	27
	4	86.1	83.0	88.8	656	78	92.0	89.4	93.9	643	45	92.6	89.5	94.8	522	30
	5	84.7	81.5	87.5	656	86	90.7	87.9	92.8	643	52	92.2	89.0	94.4	522	32
15 - 24 years	1	77.1	66.1	84.9	84	18	73.0	62.2	81.1	89	23	85.3	73.6	92.0	66	9
	2	69.6	58.1	78.5	84	24	61.5	50.4	70.9	89	33	70.4	57.2	80.2	66	18
	3	59.8	47.9	69.8	84	31	56.9	45.7	66.5	89	37	67.4	54.1	77.6	66	20
	4	56.4	44.3	66.8	84	33	54.5	43.4	64.3	89	39	65.9	52.6	76.2	66	21
	5	50.4	38.3	61.3	84	37	51.0	39.9	60.9	89	42	64.1	50.7	74.7	66	22
25 - 64 years	1	63.8	57.0	69.8	226	79	60.8	53.9	67.0	226	84	61.5	53.6	68.5	167	63
	2	43.5	36.6	50.1	226	120	46.0	39.1	52.7	226	114	45.0	37.2	52.5	167	90
	3	37.3	30.6	44.0	226	131	41.0	34.2	47.7	226	124	38.7	31.2	46.1	167	101
	4	31.3	24.7	38.1	226	140	37.4	30.8	44.0	226	132	35.7	28.4	43.1	167	106
	5	29.5	22.9	36.3	226	143	33.8	27.4	40.3	226	139	33.4	26.3	40.7	167	110
65+ years	1	29.2	22.2	36.6	155	113	25.5	18.5	33.1	141	105	39.1	29.3	48.8	102	63
	2	21.0	14.8	27.9	155	126	13.4	8.3	19.8	141	123	27.0	18.0	36.7	102	74
	3	16.7	11.0	23.5	155	133	10.4	6.0	16.3	141	128	24.6	15.6	34.6	102	77
	4	16.1	10.3	22.9	155	134	8.4	4.5	13.7	141	132	21.2	12.4	31.5	102	79
	5	12.8	7.0	20.4	155	137	6.8	3.5	11.5	141	137	18.8	10.1	29.6	102	80

Trends in survival by age (persons)

Figure 2-7. Trends in relative survival rates for acute lymphoblastic leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

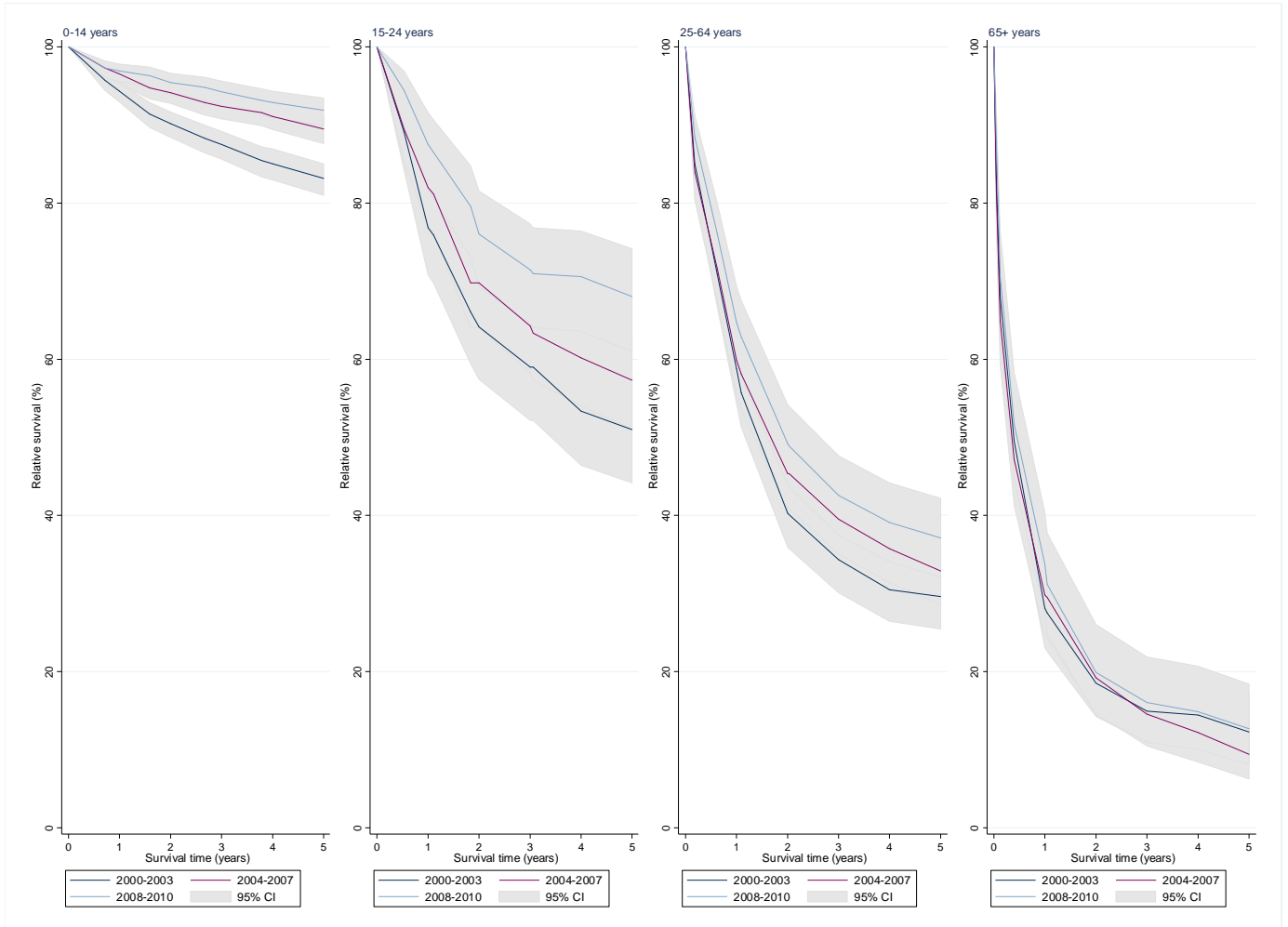


Table 2-7. Trends in relative survival rates for acute lymphoblastic leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
0 - 14 years	1	94.4	93.0	95.5	1509	73	96.6	95.4	97.4	1455	44	96.9	95.6	97.9	1150	29
	2	90.2	88.4	91.7	1509	127	94.2	92.8	95.4	1455	74	95.5	93.9	96.7	1150	42
	3	87.6	85.6	89.2	1509	161	92.4	90.8	93.8	1455	97	94.3	92.6	95.6	1150	53
	4	85.1	83.0	86.9	1509	193	91.1	89.4	92.6	1455	114	92.9	91.0	94.4	1150	66
	5	83.1	81.0	85.1	1509	218	89.5	87.7	91.1	1455	134	91.9	89.9	93.5	1150	75
15 - 24 years	1	76.9	70.8	81.9	254	52	81.9	77.0	85.9	317	52	87.5	81.8	91.5	211	23
	2	64.2	57.5	70.2	254	79	69.8	64.1	74.8	317	86	76.1	69.3	81.5	211	45
	3	59.0	52.1	65.2	254	90	64.2	58.2	69.6	317	100	71.5	64.5	77.3	211	55
	4	53.3	46.5	59.7	254	102	60.2	54.0	65.8	317	109	70.6	63.6	76.5	211	57
	5	51.0	44.1	57.4	254	107	57.4	51.1	63.1	317	115	68.1	61.0	74.1	211	62
25 - 64 years	1	58.8	54.3	63.0	523	209	59.9	55.4	64.2	509	196	64.7	59.6	69.4	394	133
	2	40.3	35.9	44.6	523	298	45.4	40.8	49.8	509	264	49.2	44.0	54.2	394	190
	3	34.3	30.1	38.6	523	326	39.5	35.0	44.0	509	290	42.5	37.4	47.6	394	214
	4	30.5	26.4	34.7	523	343	35.7	31.4	40.1	509	308	39.1	34.0	44.2	394	226
	5	29.6	25.5	33.8	523	348	32.9	28.6	37.2	509	320	37.1	32.1	42.2	394	233
65+ years	1	28.1	23.1	33.3	316	231	29.8	24.6	35.3	305	213	33.8	27.3	40.4	209	142
	2	18.5	14.3	23.2	316	262	19.2	14.7	24.1	305	244	19.9	14.4	26.0	209	169
	3	14.9	10.9	19.5	316	274	14.5	10.5	19.2	305	258	16.0	11.0	21.9	209	179
	4	14.5	10.4	19.1	316	276	12.1	8.4	16.6	305	265	14.8	9.9	20.7	209	182
	5	12.3	8.1	17.4	316	280	9.4	6.2	13.4	305	275	12.7	8.1	18.4	209	187

3. Acute myeloid leukaemia

Acute myeloid leukaemia is most common in people over the age of 60 and age-standardised incidence is higher in men. Over the period 2001-2010 there was little or no change in the age-standardised incidence and mortality. While relative survival among older adults (65+ years) diagnosed with AML was unchanged over this period, a small improvement in outcome was seen in the 25-64 year age range, with an increase in relative survival at five years among males and females combined from 30% (95% CI 28 to 31%) for individuals diagnosed in 2000-03 to 38% (95% CI: 36-40%) for those diagnosed in 2008-10.

Treatment for AML takes several months, and involves several drugs and many days in hospital. There were some alterations to the standard treatment for adults over this time and many of the patients, especially younger patients, participated in clinical trials. Some progress was made in identifying patients more likely to benefit from intensive chemotherapy, and those in whom this approach was likely to do more harm than good. Using this approach, decisions can be made at diagnosis about which patients have a reasonable chance of good response to standard chemotherapy, and which are unlikely to benefit.

New, more experimental approaches are being used in the younger patients and it is possible that allogeneic transplantation may improve outcomes. In older patients less toxic chemotherapy, which offers a fair chance of prolonged survival with less toxicity, may be selected, knowing that it will not cure the leukaemia but may extend survival.

Trends in incidence and mortality (males)

Figure 3-1. Age-standardised incidence and mortality rates for acute myeloid leukaemia in males in the period 2001-2010 in England (3 year moving average)

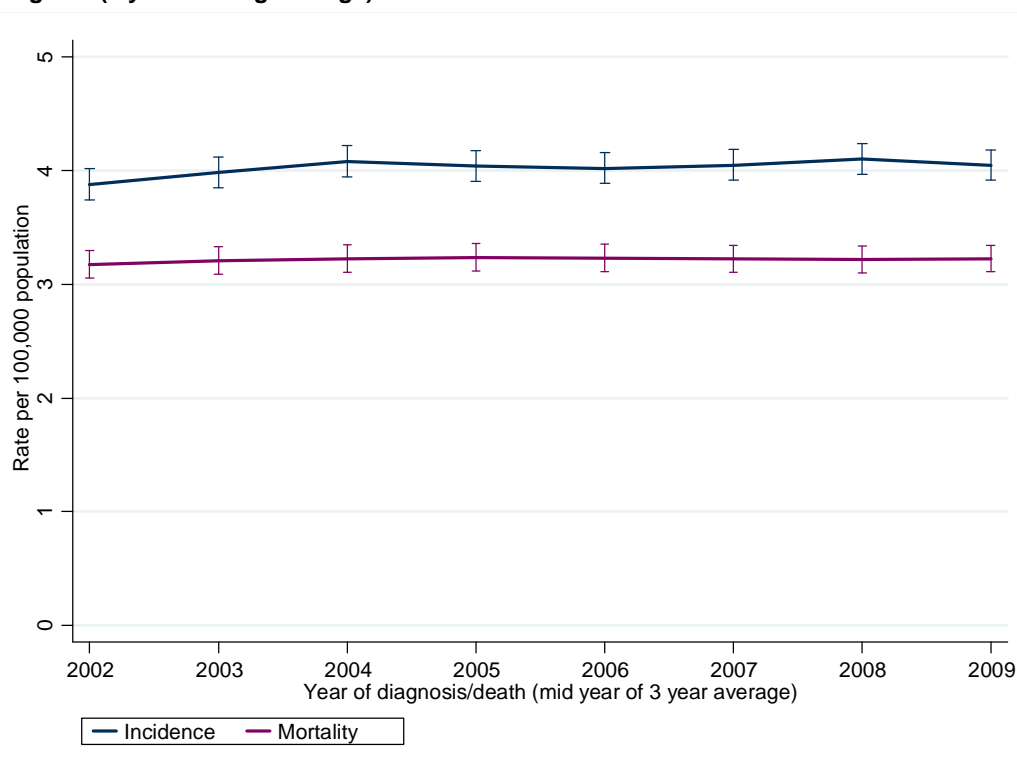


Table 3-1. Age-standardised incidence and mortality rates for acute myeloid leukaemia in males in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	1086	3.9	3.7 4.0	914	3.2	3.1 3.3
2002-2004	1130	4.0	3.8 4.1	941	3.2	3.1 3.3
2003-2005	1176	4.1	3.9 4.2	962	3.2	3.1 3.3
2004-2006	1179	4.0	3.9 4.2	980	3.2	3.1 3.4
2005-2007	1197	4.0	3.9 4.2	999	3.2	3.1 3.4
2006-2008	1222	4.0	3.9 4.2	1013	3.2	3.1 3.3
2007-2009	1264	4.1	4.0 4.2	1040	3.2	3.1 3.3
2008-2010	1267	4.0	3.9 4.2	1065	3.2	3.1 3.3

*3 year moving average

Trends in incidence and mortality (females)

Figure 3-2. Age-standardised incidence and mortality rates for acute myeloid leukaemia in females in the period 2001-2010 in England (3 year moving average)

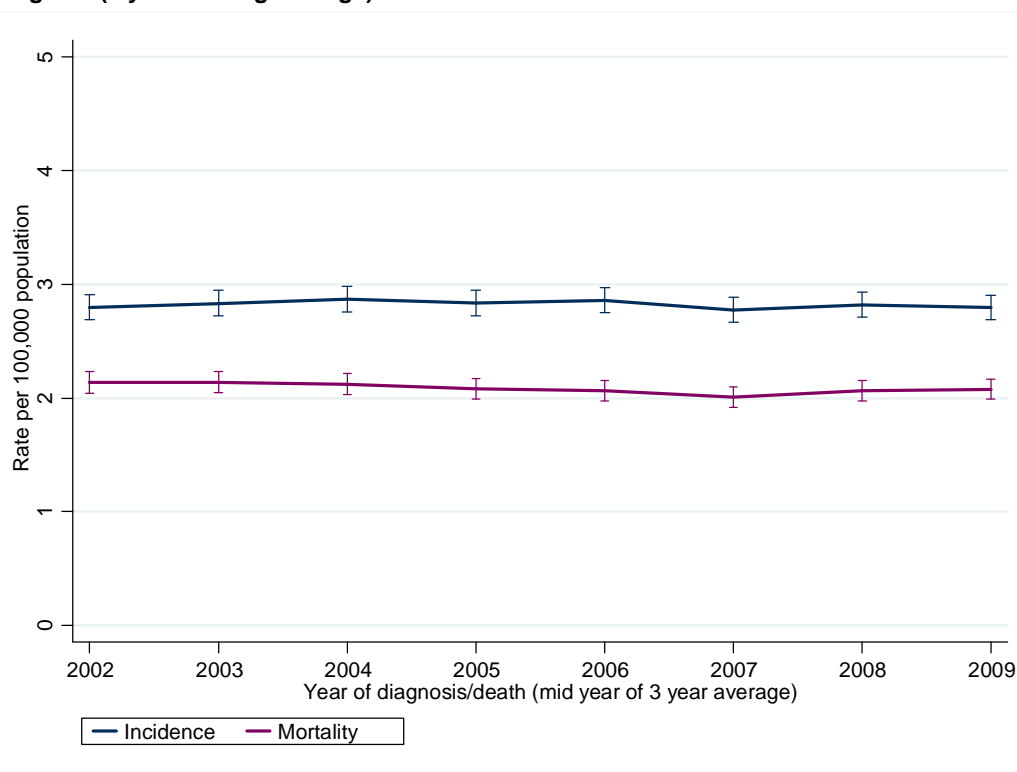


Table 3-2. Age-standardised incidence and mortality rates for acute myeloid leukaemia in females in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	945	2.8	2.7 2.9	778	2.1	2.0 2.2
2002-2004	972	2.8	2.7 2.9	792	2.1	2.0 2.2
2003-2005	990	2.9	2.8 3.0	799	2.1	2.0 2.2
2004-2006	998	2.8	2.7 2.9	800	2.1	2.0 2.2
2005-2007	1010	2.9	2.7 3.0	808	2.1	2.0 2.2
2006-2008	1003	2.8	2.7 2.9	805	2.0	1.9 2.1
2007-2009	1029	2.8	2.7 2.9	836	2.1	2.0 2.2
2008-2010	1038	2.8	2.7 2.9	863	2.1	2.0 2.2

*3 year moving average

Trends in survival (males)

Figure 3-3. Trends in relative survival rates for acute myeloid leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

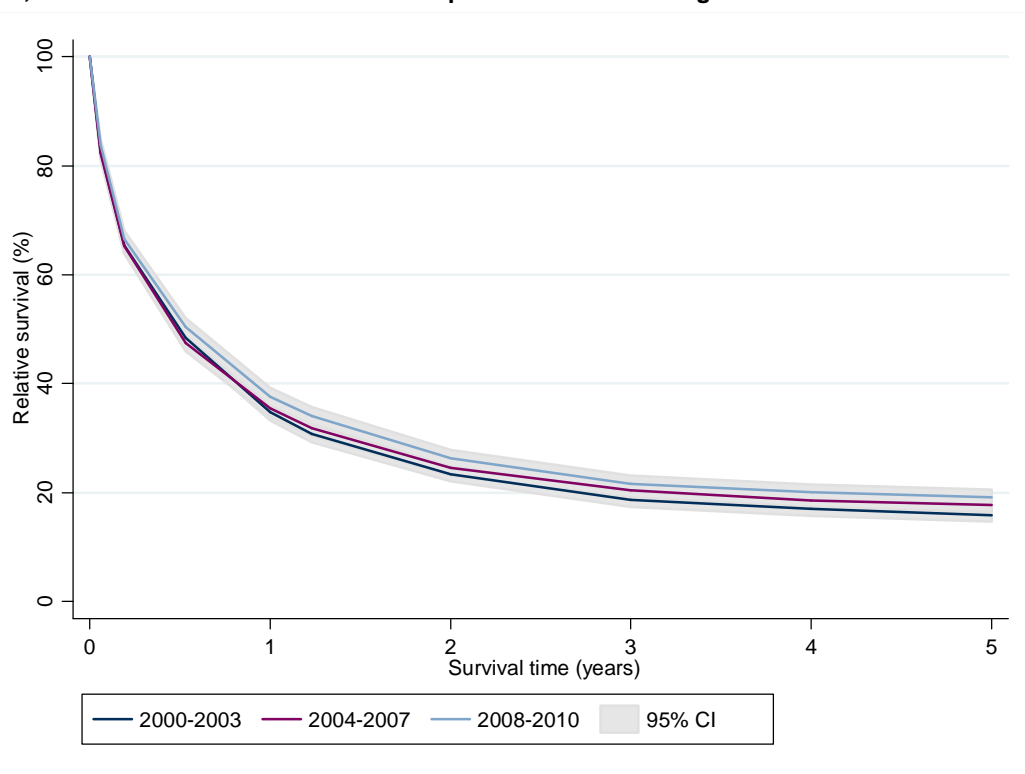


Table 3-3. Trends in relative survival rates for acute myeloid leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003					2004-2007					2008-2010				
	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths
1	34.8	33.3	36.4	3966	2564	35.5	34.0	36.9	4418	2853	37.6	36.0	39.2	3672	2289
2	23.4	22.0	24.9	3966	2992	24.5	23.2	25.9	4418	3329	26.3	24.8	27.8	3672	2679
3	18.7	17.4	20.0	3966	3172	20.4	19.1	21.7	4418	3501	21.6	20.2	23.1	3672	2832
4	17.0	15.8	18.3	3966	3245	18.6	17.4	19.9	4418	3578	20.1	18.6	21.5	3672	2890
5	15.9	14.7	17.2	3966	3294	17.7	16.5	19.0	4418	3618	19.1	17.7	20.6	3672	2924

Trends in survival (females)

Figure 3-4. Trends in relative survival rates for acute myeloid leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

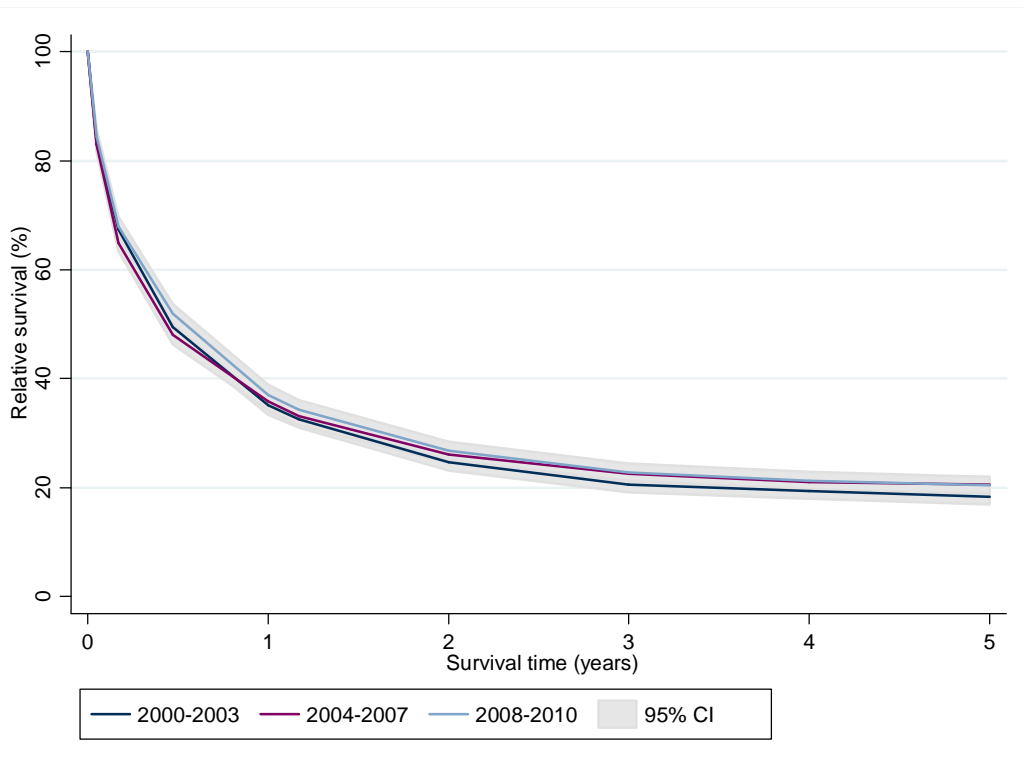


Table 3-4. Trends in relative survival rates for acute myeloid leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010			
	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths
1	35.1	33.4 - 36.7	3425	2210	35.8	34.2 - 37.4	3722	2398	37.1	35.3 - 38.8	2988	1878
2	24.6	23.1 - 26.2	3425	2556	26.1	24.6 - 27.6	3722	2748	26.8	25.1 - 28.5	2988	2177
3	20.6	19.2 - 22.0	3425	2692	22.6	21.2 - 24.0	3722	2867	22.8	21.2 - 24.4	2988	2295
4	19.4	18.0 - 20.8	3425	2732	21.0	19.6 - 22.5	3722	2925	21.3	19.7 - 22.9	2988	2342
5	18.3	17.0 - 19.7	3425	2766	20.6	19.2 - 22.0	3722	2945	20.4	18.9 - 22.0	2988	2369

Trends in survival by age (males)

Figure 3-5. Trends in relative survival rates for acute myeloid leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

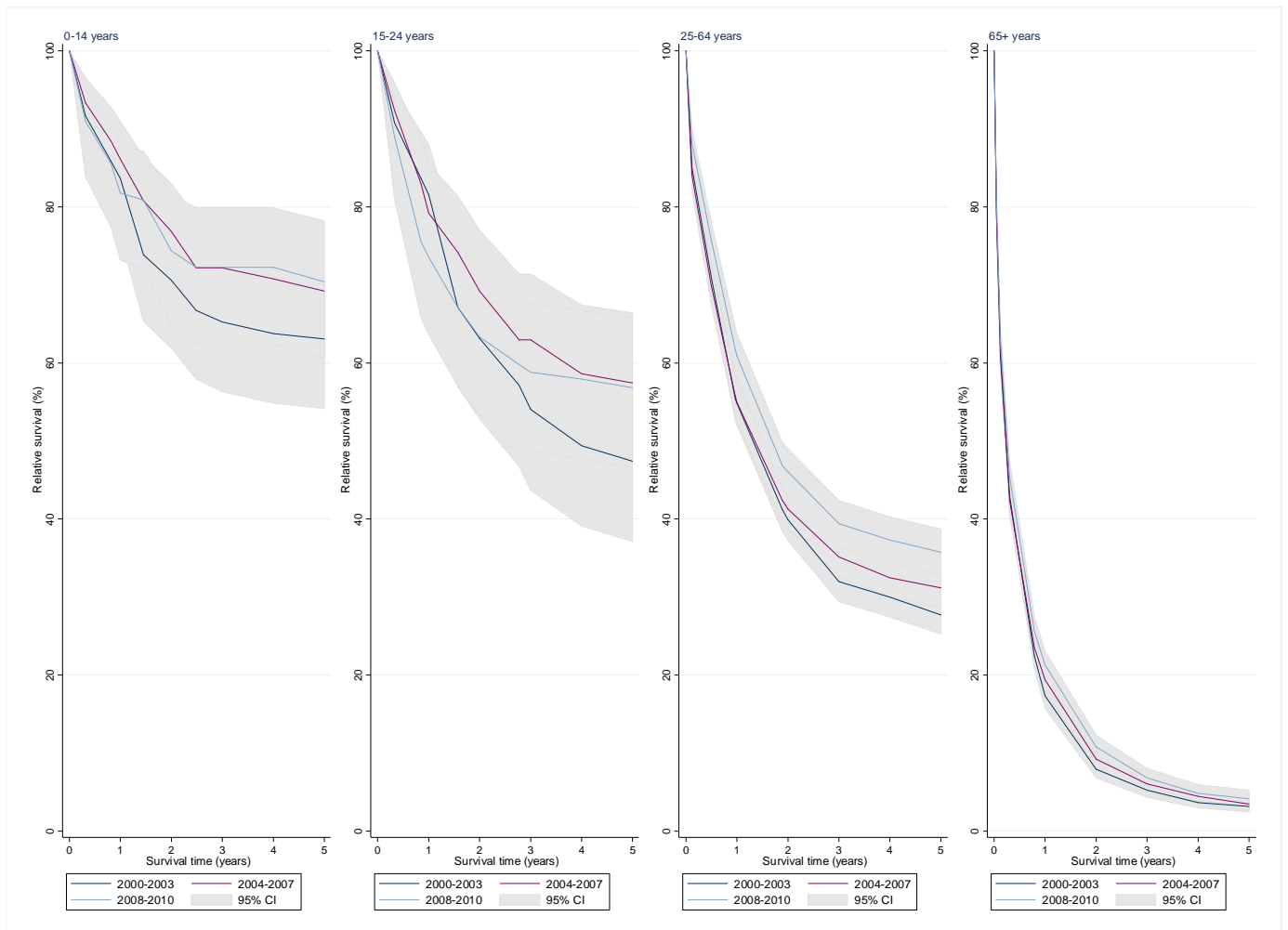


Table 3-5. Trends in relative survival rates for acute myeloid leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
0 - 14 years	1	83.7	76.3	89.0	149	22	86.2	79.2	91.0	145	19	81.8	73.2	87.9	121	20
	2	70.6	61.9	77.7	149	38	76.9	69.0	83.0	145	33	74.4	64.8	81.7	121	27
	3	65.3	56.4	72.8	149	45	72.2	64.1	78.8	145	40	74.4	64.8	81.7	121	27
	4	63.8	54.9	71.4	149	47	70.8	62.6	77.5	145	42	72.2	62.4	79.9	121	29
	5	63.1	54.1	70.8	149	48	69.2	60.9	76.1	145	44	70.4	60.6	78.3	121	31
15 - 24 years	1	81.6	72.3	88.0	108	18	79.2	70.6	85.6	127	24	73.6	63.7	81.2	113	26
	2	63.2	52.8	71.9	108	36	69.2	59.6	77.0	127	34	63.4	53.2	71.9	113	37
	3	54.0	43.7	63.3	108	45	62.9	52.9	71.4	127	40	58.8	48.7	67.6	113	42
	4	49.4	39.1	59.0	108	49	58.6	48.4	67.4	127	44	57.9	47.7	66.8	113	43
	5	47.4	37.1	57.0	108	51	57.4	47.1	66.4	127	45	56.8	46.6	65.8	113	44
25 - 64 years	1	54.8	52.1	57.5	1365	597	55.0	52.4	57.5	1472	649	60.9	57.9	63.7	1166	440
	2	39.9	37.2	42.6	1365	789	41.3	38.7	43.8	1472	846	46.0	43.0	49.0	1166	602
	3	32.0	29.4	34.6	1365	893	35.2	32.6	37.7	1472	930	39.4	36.4	42.4	1166	671
	4	30.0	27.4	32.5	1365	923	32.5	30.0	35.0	1472	967	37.4	34.4	40.3	1166	693
	5	27.7	25.3	30.3	1365	955	31.2	28.7	33.7	1472	985	35.7	32.7	38.7	1166	711
65+ years	1	17.3	15.7	18.9	2367	1927	19.4	17.9	21.0	2711	2161	21.3	19.6	23.1	2289	1803
	2	7.9	6.8	9.2	2367	2129	9.2	8.1	10.4	2711	2416	10.8	9.5	12.3	2289	2013
	3	5.2	4.3	6.3	2367	2189	6.0	5.1	7.1	2711	2491	6.8	5.7	8.0	2289	2090
	4	3.7	2.9	4.6	2367	2226	4.4	3.6	5.4	2711	2525	4.8	3.8	5.9	2289	2125
	5	3.2	2.4	4.0	2367	2240	3.5	2.7	4.4	2711	2544	4.1	3.2	5.2	2289	2138

Trends in survival by age (females)

Figure 3-6. Trends in relative survival rates for acute myeloid leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

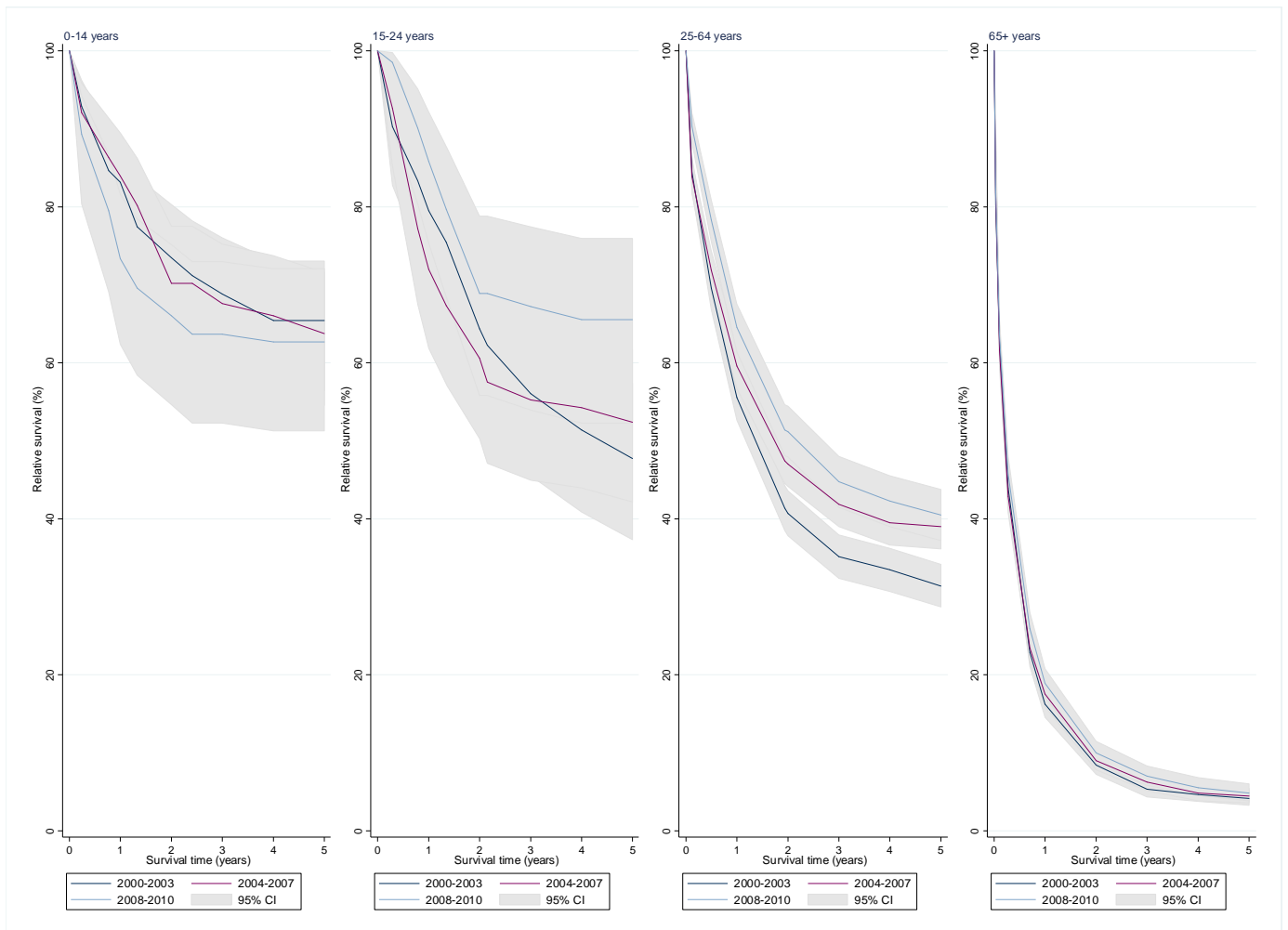


Table 3-6. Trends in relative survival rates for acute myeloid leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
0 - 14 years	1	83.1	75.5	88.6	138	22	84.0	76.0	89.5	126	19	73.4	62.4	81.6	96	22
	2	73.5	64.9	80.3	138	34	70.2	61.2	77.5	126	36	66.0	54.7	75.2	96	28
	3	68.8	59.9	76.0	138	40	67.7	58.5	75.2	126	39	63.6	52.3	73.0	96	30
	4	65.5	56.5	73.0	138	44	66.1	56.9	73.8	126	41	62.7	51.3	72.1	96	31
	5	65.5	56.5	73.0	138	44	63.7	54.5	71.6	126	44	62.7	51.3	72.1	96	31
15 - 24 years	1	79.5	70.3	86.1	111	21	72.0	61.9	79.9	103	27	85.9	75.4	92.2	84	10
	2	64.4	54.0	73.0	111	35	60.6	50.3	69.4	103	39	68.9	55.8	78.8	84	20
	3	56.0	45.5	65.2	111	43	55.3	44.9	64.4	103	44	67.2	54.0	77.4	84	21
	4	51.4	40.9	60.9	111	47	54.3	44.0	63.5	103	45	65.6	52.3	76.0	84	22
	5	47.7	37.3	57.5	111	50	52.4	42.1	61.7	103	47	65.6	52.3	76.0	84	22
25 - 64 years	1	55.5	52.6	58.3	1214	524	59.6	56.8	62.3	1247	488	64.6	61.4	67.6	962	329
	2	40.7	37.9	43.5	1214	696	47.0	44.1	49.9	1247	635	51.2	47.9	54.4	962	451
	3	35.1	32.4	37.9	1214	762	41.9	39.0	44.7	1247	691	44.7	41.5	48.0	962	511
	4	33.5	30.7	36.2	1214	783	39.5	36.6	42.3	1247	718	42.3	39.0	45.5	962	534
	5	31.4	28.7	34.1	1214	805	39.0	36.2	41.9	1247	724	40.5	37.3	43.8	962	550
65+ years	1	16.2	14.5	17.9	1987	1643	17.5	15.9	19.2	2280	1864	18.9	17.1	20.8	1877	1517
	2	8.4	7.2	9.7	1987	1791	9.0	7.8	10.3	2280	2038	10.0	8.6	11.5	1877	1678
	3	5.3	4.3	6.4	1987	1847	6.2	5.1	7.3	2280	2093	7.0	5.8	8.3	1877	1733
	4	4.7	3.7	5.8	1987	1858	4.8	3.9	5.9	2280	2121	5.6	4.5	6.8	1877	1755
	5	4.1	3.2	5.3	1987	1867	4.4	3.5	5.5	2280	2130	4.8	3.8	6.0	1877	1766

Trends in survival by age (persons)

Figure 3-7. Trends in relative survival rates for acute myeloid leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

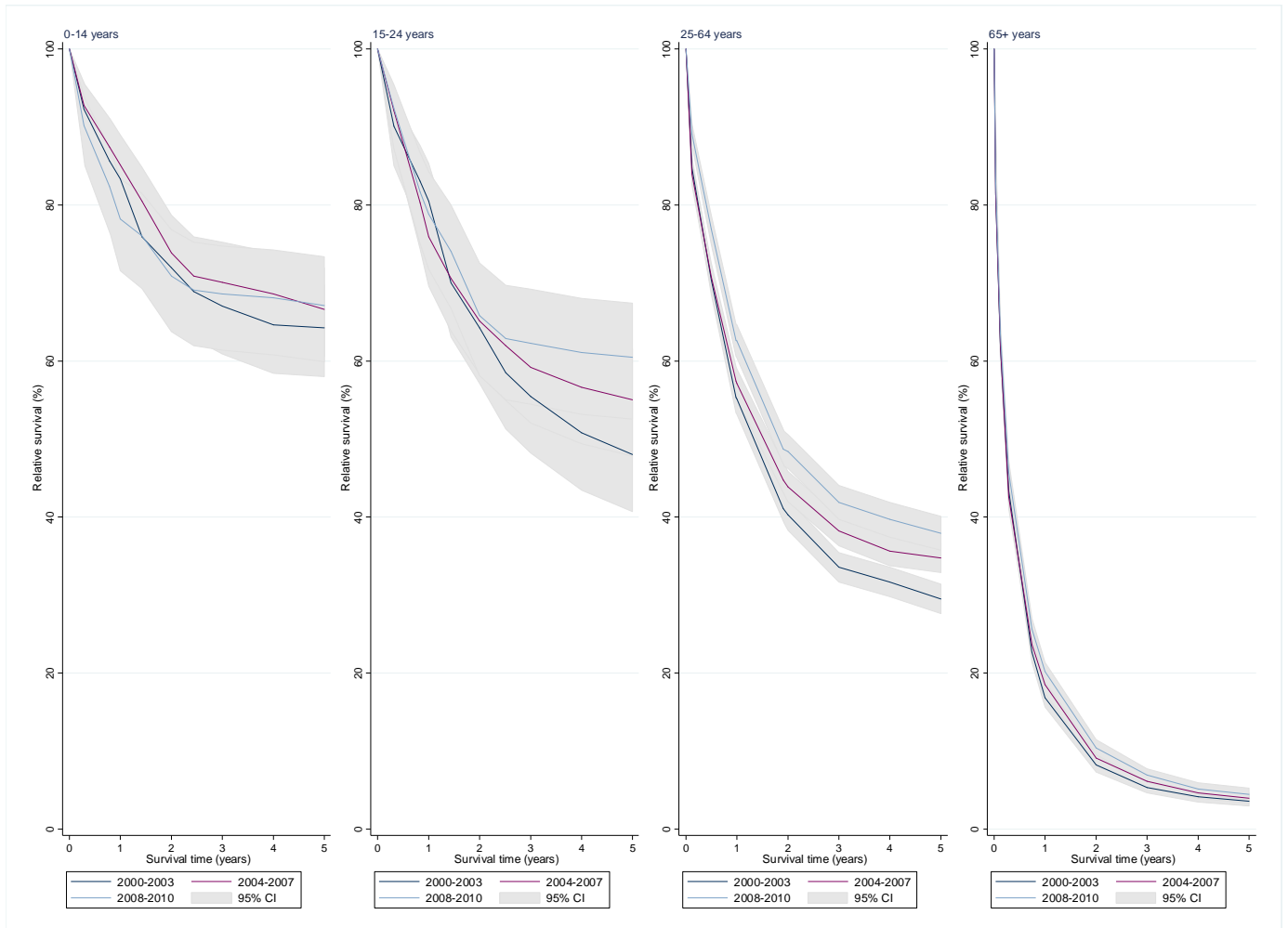


Table 3-7. Trends in Relative survival rates for acute myeloid leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
0 - 14 years	1	83.4	78.3	87.4	289	44	85.2	80.2	89.0	272	38	78.2	71.6	83.4	217	42
	2	72.0	66.1	77.1	289	72	73.9	68.1	78.7	272	69	70.9	63.8	76.8	217	55
	3	67.0	60.9	72.4	289	85	70.1	64.2	75.3	272	79	68.6	61.4	74.7	217	59
	4	64.6	58.4	70.2	289	91	68.6	62.7	73.9	272	83	68.1	60.8	74.3	217	60
	5	64.3	58.1	69.8	289	92	66.7	60.6	72.0	272	88	67.1	59.9	73.4	217	62
15 - 24 years	1	80.6	74.4	85.4	220	39	76.0	69.6	81.2	229	51	78.8	71.8	84.2	190	36
	2	64.2	57.1	70.5	220	71	65.2	58.3	71.2	229	73	65.9	58.1	72.6	190	57
	3	55.4	48.2	62.1	220	88	59.2	52.1	65.6	229	84	62.3	54.4	69.2	190	63
	4	50.8	43.5	57.6	220	96	56.6	49.4	63.1	229	89	61.1	53.2	68.1	190	65
	5	48.0	40.7	54.9	220	101	55.0	47.8	61.6	229	92	60.5	52.6	67.5	190	66
25 - 64 years	1	55.2	53.2	57.1	2579	1121	57.1	55.2	59.0	2719	1137	62.6	60.4	64.6	2128	769
	2	40.3	38.4	42.3	2579	1485	43.9	41.9	45.8	2719	1481	48.4	46.2	50.6	2128	1053
	3	33.5	31.6	35.4	2579	1655	38.2	36.3	40.1	2719	1621	41.9	39.7	44.1	2128	1182
	4	31.7	29.8	33.5	2579	1706	35.7	33.8	37.6	2719	1685	39.7	37.5	41.8	2128	1227
	5	29.5	27.7	31.4	2579	1760	34.8	32.9	36.7	2719	1709	37.9	35.7	40.1	2128	1261
65+ years	1	16.8	15.7	18.0	4341	3570	18.5	17.4	19.7	4987	4025	20.1	18.9	21.4	4160	3320
	2	8.2	7.3	9.1	4341	3920	9.1	8.3	10.0	4987	4454	10.4	9.4	11.4	4160	3691
	3	5.3	4.6	6.0	4341	4036	6.1	5.4	6.8	4987	4584	6.9	6.1	7.7	4160	3823
	4	4.1	3.5	4.8	4341	4084	4.6	4.0	5.3	4987	4646	5.2	4.4	6.0	4160	3880
	5	3.6	3.0	4.3	4341	4107	3.9	3.3	4.6	4987	4674	4.5	3.8	5.2	4160	3904

4. Chronic lymphocytic leukaemia

Chronic lymphocytic leukaemia (CLL) is predominantly a disease of the elderly, with higher age-standardised incidence in males. There were no marked changes across the period reported in the age-standardised incidence or mortality of CLL and no statistically significant improvement in survival.

CLL is a relatively indolent cancer for which histopathology laboratories will not necessarily be involved in diagnosis and where treatment can be delivered in an outpatient setting, factors which combine to reduce the likelihood of notification to cancer registries. There is evidence of wide variation in registration rates at a sub-national level for CLL,¹ and improvements in ascertainment over time, particularly in the North West since 2008 (see appendix 2). Both absolute levels of incidence and trends in incidence should be treated with caution. In addition, as variable levels of ascertainment of CLL may be related to the stage of disease at presentation (with the most indolent cancers probably those least likely to be registered), changes in survival may also be subject to artefact.

The time period covered by the analysis produced great advances in our understanding of this disease, but no overall improvement in survival is shown in the data in this report. In more recent years clinical management has been changing for patients with CLL. Two important new drugs have been introduced into the treatment of CLL: fludarabine and rituximab. Fludarabine was being used in some patients in the period reported, sometimes for disease progression after first line therapy, and sometimes as initial treatment. Both treatments (usually given with cyclophosphamide) have now been shown to improve survival in randomised clinical trials and it is likely that patients diagnosed since 2008 will experience further improvements in long term survival. The use of autologous and allogeneic transplantation as part of treatment gradually increased during the period reported, and their place in clinical practice is now clearer. Other drugs: alemtuzumab, bendamustine and ofatumumab have also now been introduced into clinical practice in the UK. Looking to the future, a number of new targeted therapies including BTK inhibitors, BCL2 anti-sense molecules and P13 K inhibitors, as well as more potent antibodies, have shown encouraging early outcome data.

¹ http://www.ncin.org.uk/publications/data_briefings/understanding_outcomes_in_leukaemia.aspx

Trends in incidence and mortality (males)

Figure 4-1. Age-standardised incidence and mortality rates for chronic lymphocytic leukaemia in males (all ages) in the period 2001-2010 in England (3 year moving average)

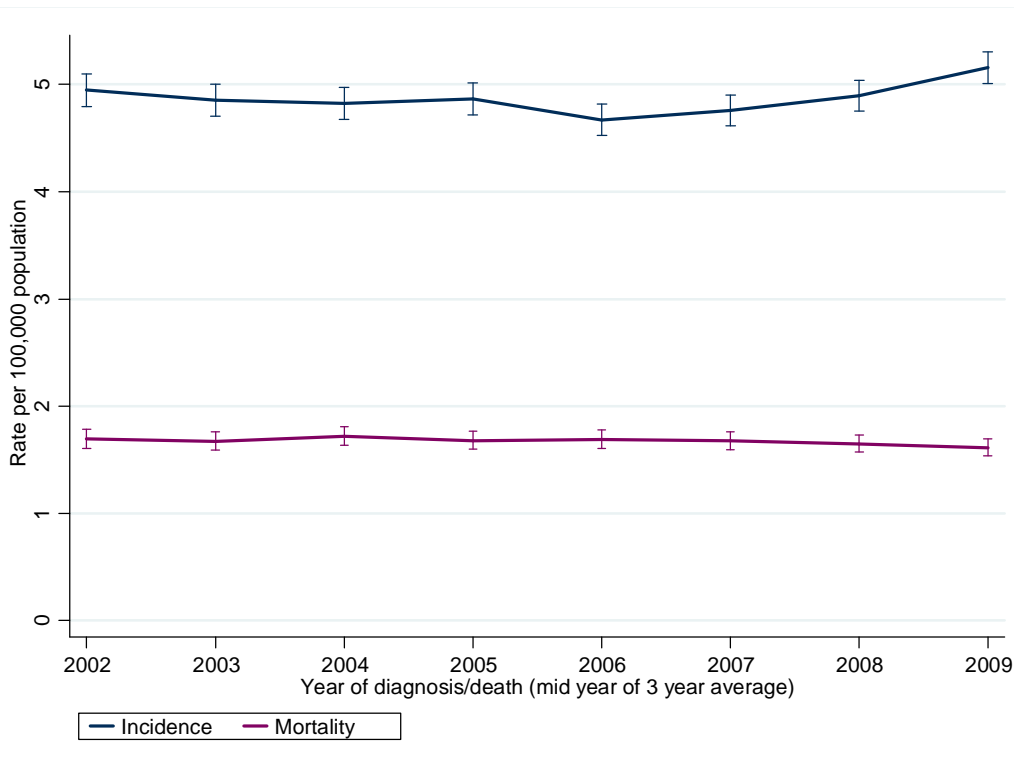


Table 4-1. Age-standardised incidence and mortality rates for chronic lymphocytic leukaemia in males (all ages) in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	1413	4.9	4.8 5.1	509	1.7	1.6 1.8
2002-2004	1413	4.9	4.7 5.0	508	1.7	1.6 1.8
2003-2005	1423	4.8	4.7 5.0	534	1.7	1.6 1.8
2004-2006	1458	4.9	4.7 5.0	535	1.7	1.6 1.8
2005-2007	1423	4.7	4.5 4.8	552	1.7	1.6 1.8
2006-2008	1483	4.8	4.6 4.9	560	1.7	1.6 1.8
2007-2009	1555	4.9	4.8 5.0	565	1.6	1.6 1.7
2008-2010	1666	5.2	5.0 5.3	566	1.6	1.5 1.7

*3 year moving average

Trends in incidence and mortality (females)

Figure 4-2. Age-standardised incidence and mortality rates for chronic lymphocytic leukaemia in females (all ages) in the period 2001-2010 in England (3 year moving average)

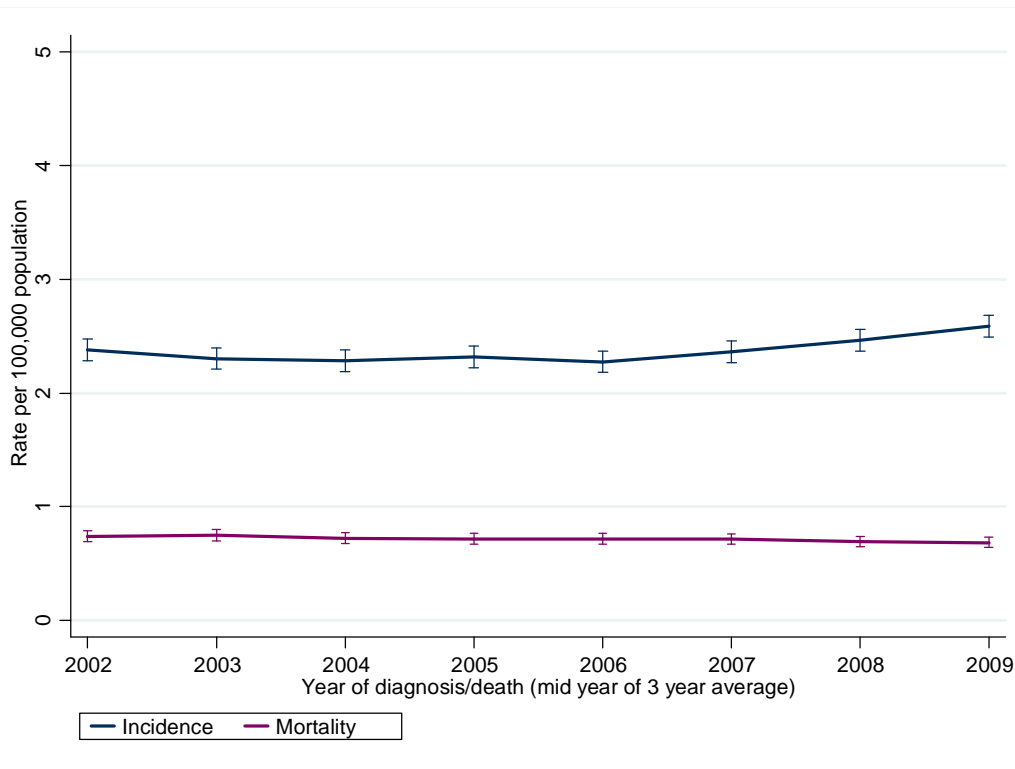


Table 4-2. Age-standardised incidence and mortality rates for chronic lymphocytic leukaemia in females (all ages) in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	946	2.4	2.3 2.5	371	0.7	0.7 0.8
2002-2004	913	2.3	2.2 2.4	374	0.7	0.7 0.8
2003-2005	918	2.3	2.2 2.4	366	0.7	0.7 0.8
2004-2006	940	2.3	2.2 2.4	366	0.7	0.7 0.8
2005-2007	923	2.3	2.2 2.4	378	0.7	0.7 0.8
2006-2008	958	2.4	2.3 2.5	378	0.7	0.7 0.8
2007-2009	1007	2.5	2.4 2.6	369	0.7	0.6 0.7
2008-2010	1060	2.6	2.5 2.7	369	0.7	0.6 0.7

*3 year moving average

Trends in survival (males)

Figure 4-3. Trends in relative survival rates for chronic lymphocytic leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

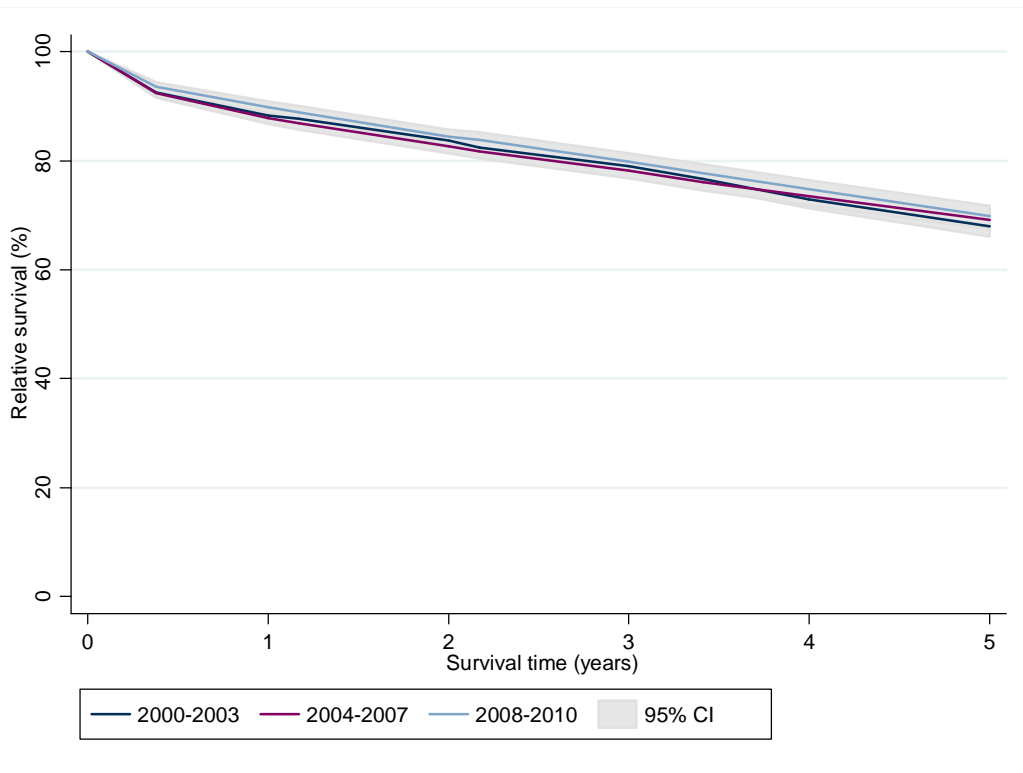


Table 4-3. Trends in relative survival rates for chronic lymphocytic leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003					2004-2007					2008-2010				
	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths
1	88.3	87.2	89.3	5796	919	87.9	86.8	88.9	5745	927	89.8	88.7	90.9	5284	740
2	83.7	82.4	84.9	5796	1370	82.7	81.4	83.9	5745	1394	84.5	83.1	85.8	5284	1141
3	79.0	77.5	80.4	5796	1758	78.2	76.8	79.6	5745	1800	79.8	78.2	81.4	5284	1450
4	73.0	71.3	74.6	5796	2139	73.5	71.9	75.0	5745	2184	74.8	73.0	76.5	5284	1728
5	68.0	66.2	69.7	5796	2440	69.2	67.5	70.8	5745	2526	69.9	67.9	71.7	5284	1990

Trends in survival (females)

Figure 4-4. Trends in relative survival rates for chronic lymphocytic leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

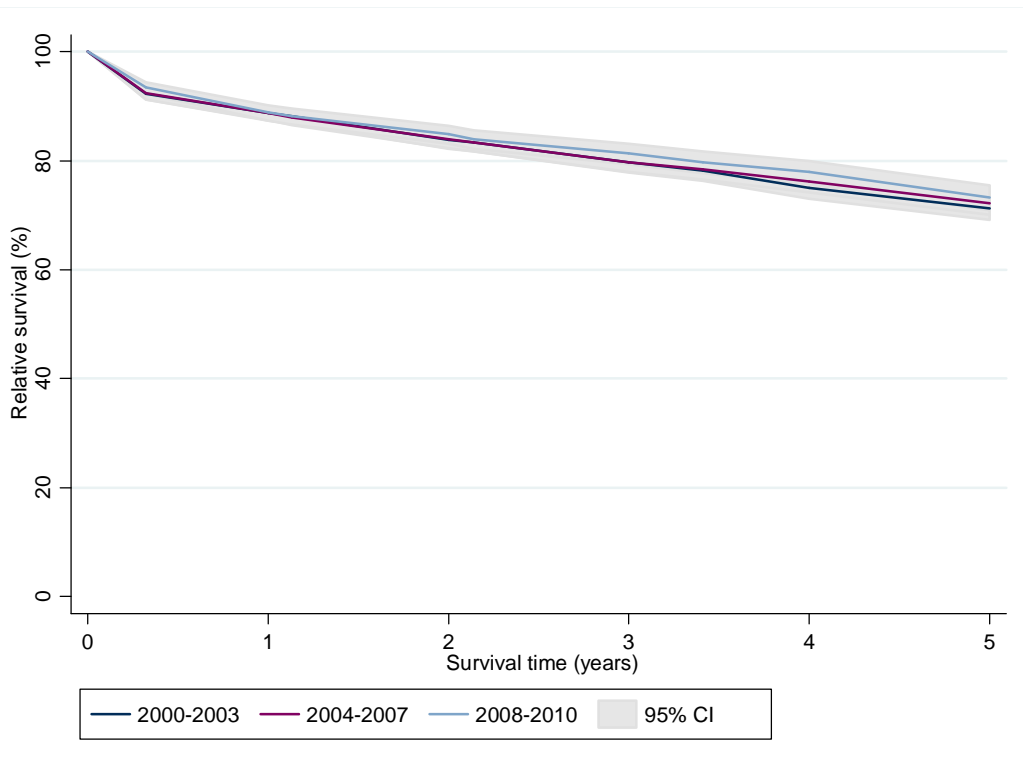


Table 4-4. Trends in relative survival rates for chronic lymphocytic leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010			
	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths
1	88.7	87.4 - 90.0	3782	611	88.8	87.4 - 90.0	3633	576	88.9	87.4 - 90.2	3256	482
2	83.8	82.2 - 85.3	3782	933	84.0	82.4 - 85.5	3633	870	84.9	83.1 - 86.5	3256	698
3	79.7	77.9 - 81.4	3782	1193	79.8	78.0 - 81.5	3633	1120	81.4	79.4 - 83.2	3256	870
4	75.1	73.1 - 77.0	3782	1429	76.2	74.2 - 78.0	3633	1341	78.0	75.8 - 80.0	3256	1027
5	71.3	69.1 - 73.3	3782	1624	72.2	70.1 - 74.2	3633	1559	73.3	70.9 - 75.5	3256	1191

Trends in survival by age (males)

Figure 4-5. Trends in relative survival rates for chronic lymphocytic leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

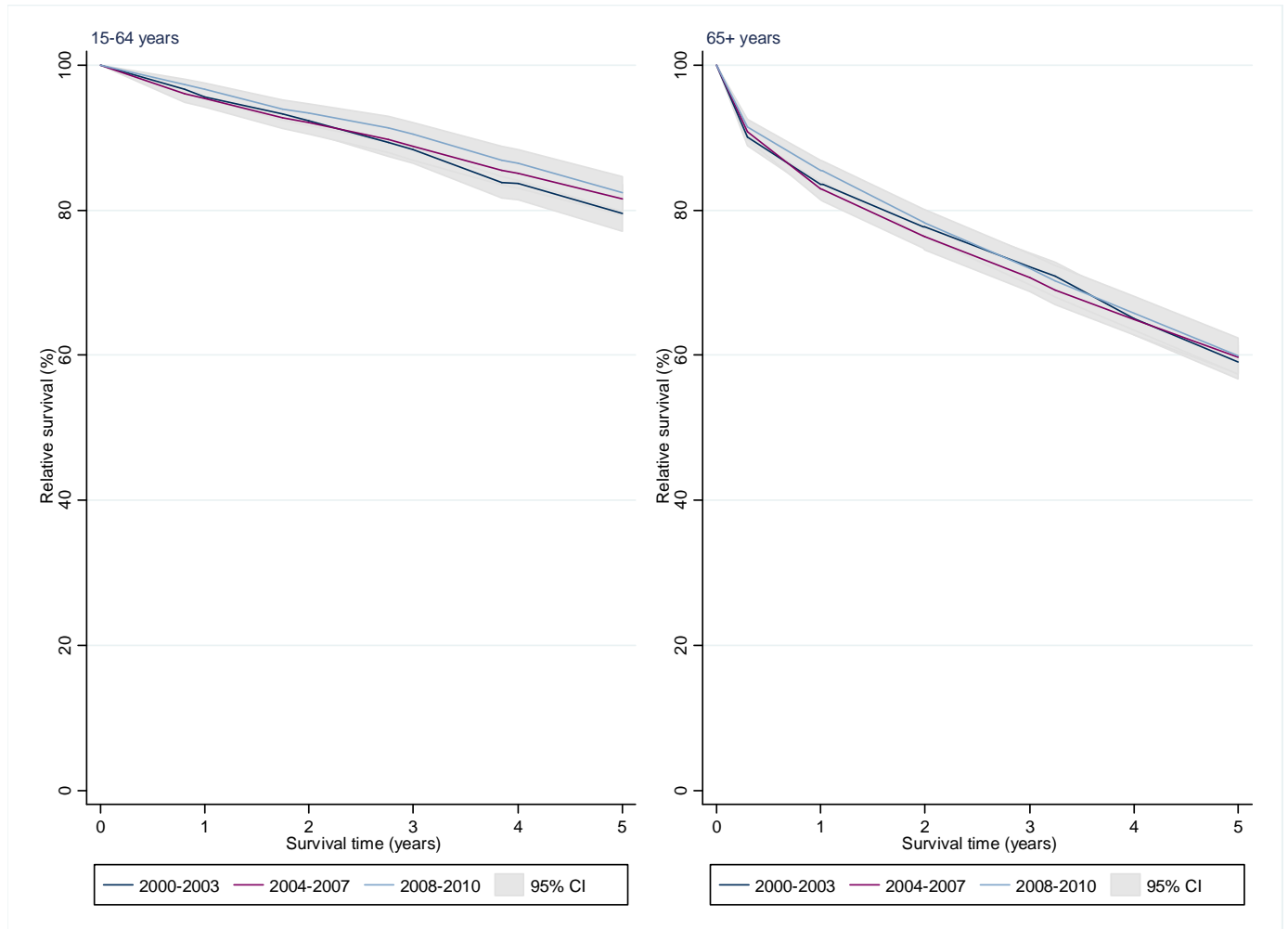


Table 4-5. Trends in relative survival rates for chronic lymphocytic leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	95.6	94.3	96.5	1949	88	95.4	94.2	96.4	1971	89	96.6	95.4	97.6	1768	60
	2	92.3	90.7	93.7	1949	156	92.0	90.4	93.4	1971	157	93.4	91.7	94.7	1768	114
	3	88.4	86.5	90.1	1949	230	88.7	86.9	90.4	1971	222	90.5	88.5	92.1	1768	160
	4	83.7	81.4	85.6	1949	310	85.1	83.0	86.9	1971	297	86.4	84.2	88.4	1768	220
	5	79.5	77.0	81.7	1949	377	81.5	79.3	83.6	1971	370	82.4	79.8	84.6	1768	278
65+ years	1	83.6	82.1	85.0	3941	831	83.0	81.5	84.4	3894	838	85.5	83.9	86.8	3614	680
	2	77.7	76.0	79.4	3941	1214	76.3	74.6	78.0	3894	1237	78.3	76.4	80.0	3614	1027
	3	72.2	70.2	74.1	3941	1528	70.7	68.7	72.6	3894	1578	71.9	69.7	74.0	3614	1290
	4	65.0	62.8	67.2	3941	1829	65.0	62.8	67.0	3894	1887	65.8	63.4	68.1	3614	1508
	5	59.1	56.7	61.5	3941	2063	59.7	57.5	61.9	3894	2156	60.0	57.4	62.4	3614	1712

Trends in survival by age (females)

Figure 4-6. Trends in relative survival rates for chronic lymphocytic leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

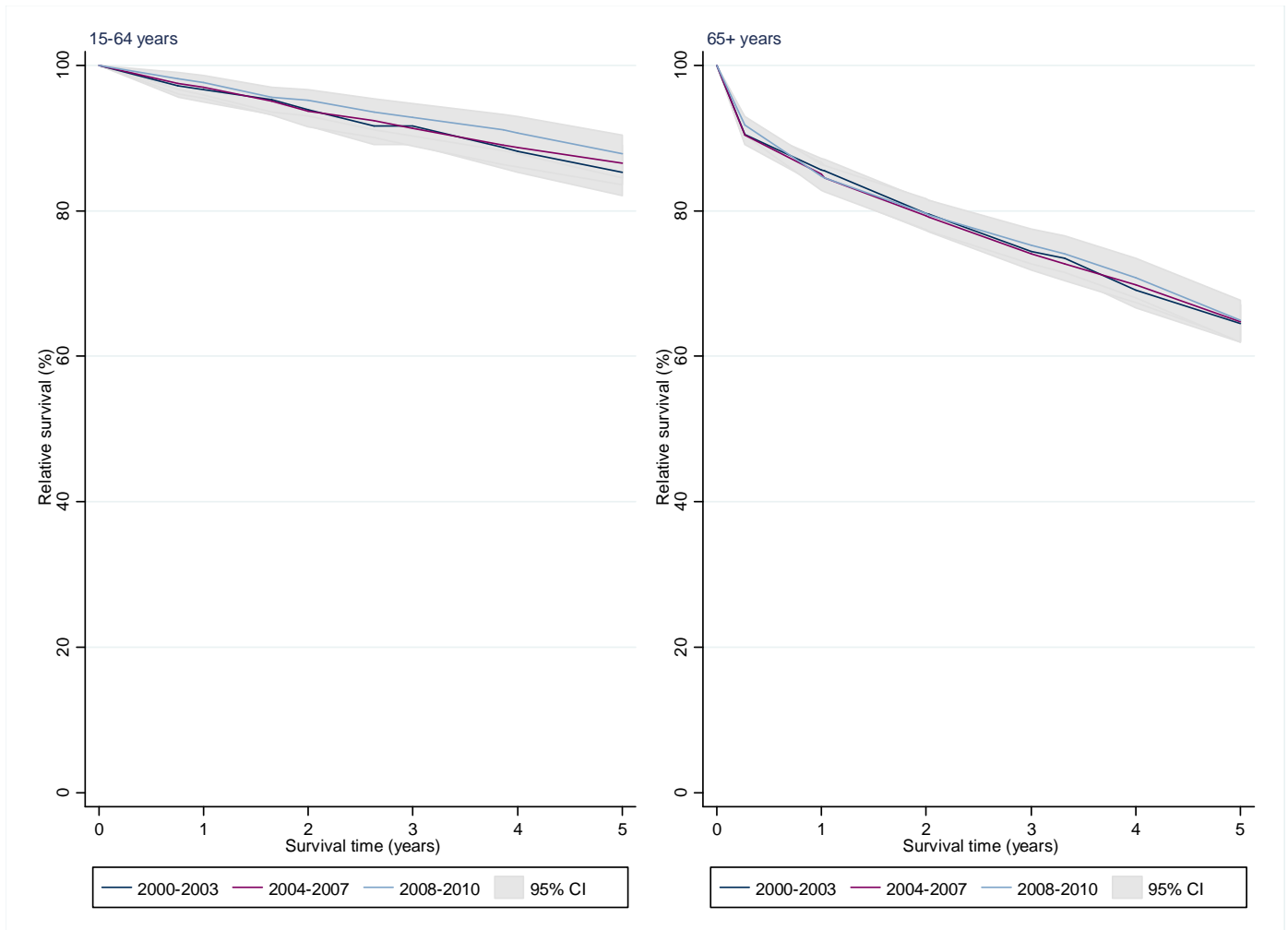


Table 4-6. Trends in relative survival rates for chronic lymphocytic leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	96.7	94.9	97.8	894	30	97.0	95.4	98.1	949	28	97.6	96.0	98.6	887	21
	2	93.8	91.6	95.5	894	55	93.7	91.6	95.3	949	58	95.2	93.0	96.7	887	41
	3	91.6	89.1	93.6	894	75	91.3	88.8	93.2	949	81	92.9	90.3	94.8	887	59
	4	88.2	85.3	90.5	894	103	88.7	86.0	90.9	949	105	90.7	87.8	92.9	887	75
	5	85.3	82.1	87.9	894	127	86.5	83.6	89.0	949	126	87.8	84.6	90.4	887	95
65+ years	1	85.6	84.0	87.2	2946	581	85.1	83.3	86.6	2737	548	84.7	82.8	86.4	2425	461
	2	79.7	77.7	81.5	2946	878	79.4	77.3	81.3	2737	812	79.7	77.4	81.7	2425	657
	3	74.4	72.2	76.5	2946	1118	74.1	71.8	76.2	2737	1039	75.2	72.7	77.5	2425	811
	4	69.1	66.6	71.4	2946	1326	69.8	67.4	72.1	2737	1236	70.8	68.1	73.4	2425	952
	5	64.6	61.9	67.1	2946	1497	64.8	62.2	67.2	2737	1433	64.9	62.0	67.7	2425	1096

Trends in survival by age (persons)

Figure 4-7. Trends in relative survival rates for chronic lymphocytic leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

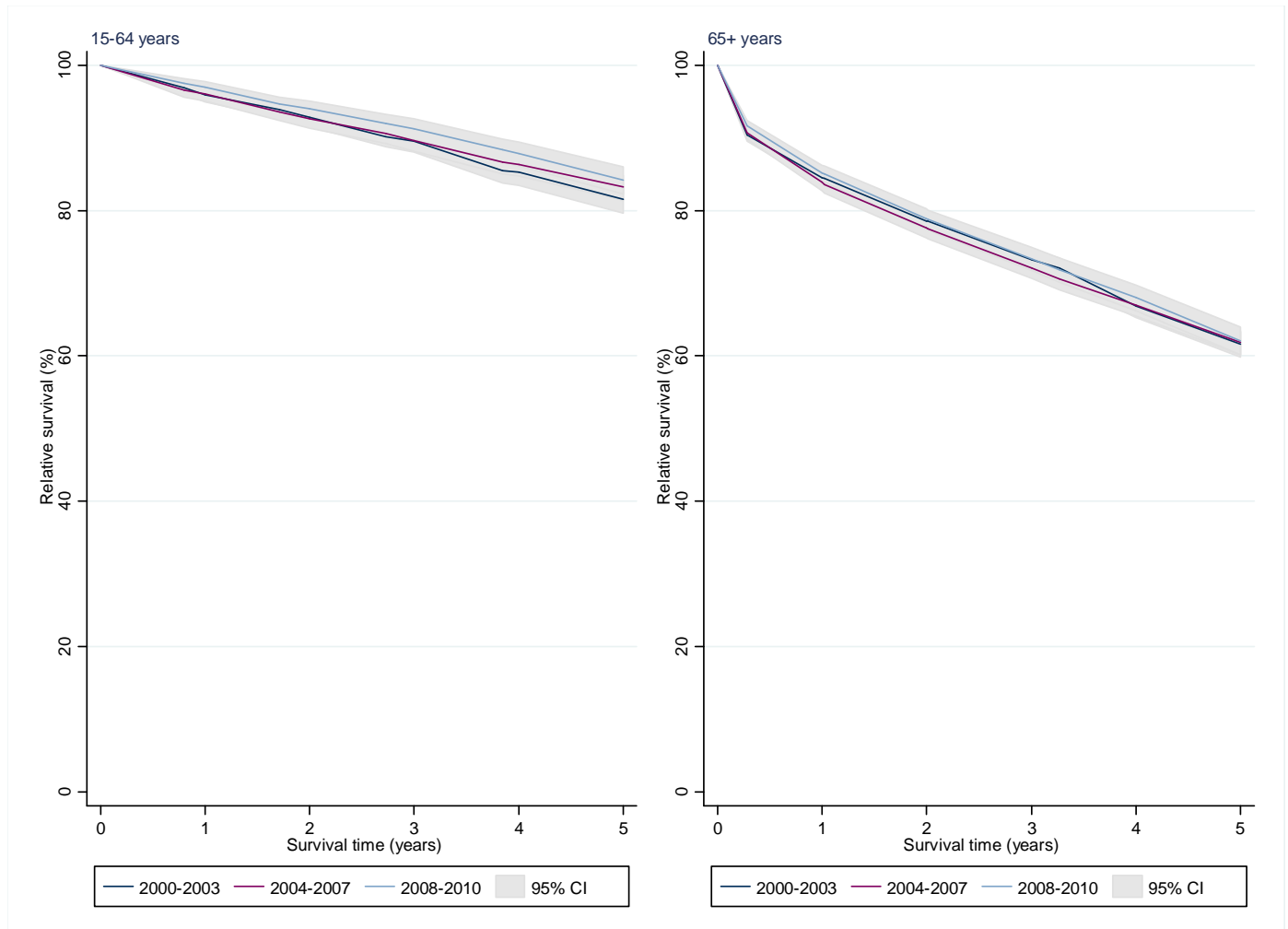


Table 4-7. Trends in relative survival rates for chronic lymphocytic leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	95.9	95.0	96.7	2849	118	96.0	95.0	96.8	2922	117	97.0	96.0	97.7	2660	81
	2	92.8	91.6	93.9	2849	211	92.6	91.4	93.7	2922	215	94.0	92.7	95.0	2660	155
	3	89.5	88.0	90.9	2849	305	89.6	88.2	90.9	2922	303	91.3	89.8	92.6	2660	219
	4	85.2	83.5	86.8	2849	413	86.3	84.7	87.8	2922	402	87.9	86.1	89.4	2660	295
	5	81.5	79.6	83.3	2849	504	83.3	81.5	84.9	2922	496	84.2	82.3	86.0	2660	373
65+ years	1	84.5	83.4	85.5	6882	1412	83.8	82.7	84.9	6622	1386	85.1	84.0	86.2	6025	1141
	2	78.6	77.3	79.8	6882	2092	77.6	76.3	78.9	6622	2049	78.9	77.4	80.2	6025	1684
	3	73.2	71.7	74.6	6882	2646	72.1	70.6	73.5	6622	2617	73.4	71.7	74.9	6025	2101
	4	66.9	65.2	68.5	6882	3155	67.0	65.4	68.5	6622	3123	68.0	66.2	69.7	6025	2460
	5	61.6	59.9	63.3	6882	3560	61.9	60.2	63.5	6622	3589	62.1	60.2	64.0	6025	2808

5. Chronic myeloid leukaemia

Chronic myeloid leukaemia (CML) is a relatively rare cancer, predominantly affecting people over the age of 60, with higher age-standardised incidence in males. There were no changes in the incidence of CML between 2001 and 2010; but there have been marked changes in mortality and survival over this time.

Relative survival curves comparing consecutive diagnostic cohorts show a substantial improvement, in both males and females. For patients aged 15-64 years relative survival at five years among males and females combined rose from 59% (95% CI: 56-63%) for individuals diagnosed in 2000-03 to 87% (95% CI: 84-90%) for those diagnosed in 2008-10. Improvement in outcomes has also been observed in older individuals, for patients aged 65 and over relative survival at five years among males and females combined rose from 22% (95% CI 19-26%) for individuals diagnosed in 2000-03 to 44% (95% CI 39-48%) for those diagnosed in 2008-10. However, the observation that reported CML survival in older people remains low, in the absence of any evidence of either differences in treatment efficacy or uptake of treatment, raises questions as to the accuracy of cancer registration for CML in older patients.

The improvement in prognosis is due to the introduction of a new drug – the tyrosine-kinase inhibitors, (imatinib, nilotinib, dasatinb and others) which were being used increasingly to treat patients with CML over the period 2001-10. The drug imatinib received a licence for use in the UK in November 2001, with NICE Technology appraisals in October 2002 and 2003 extending its use so that from 2003 onwards most patients newly diagnosed with CML were treated with imatinib or alternative tyrosine-kinase inhibitors, and most patients already on other drugs were switched to the new drug.

Until the 1990's cancer registrations for CML were not distinguished from chronic myelomonocytic leukaemia (CMML). While CMML is now registered separately from CML there is a possibility, particularly in the elderly, that registrations for CML may include some cases of CMML. This may contribute to the high rates of incidence reported in the elderly, and, as CMML has a poorer prognosis than CML, may result in an under-estimate of relative survival in older patients following a diagnosis of CML. The difference in survival observed between younger and older patients with CML in these English cancer registry data was not observed in a recent paper based on data from the Haematological Malignancy Research Network, which has the advantage of very high quality diagnostic data.² In that study, 5 year relative survival was over 87% in both patients <60 years and ≥60 years.

² Smith AG, Painter D, Howell DA, et al. Determinants of survival in patients with chronic myeloid leukaemia treated in the new era of oral therapy: findings from a UK population-based patient cohort. *BMJ Open* 2014;4:e004266.doi:10.1136/bmjopen-2013-004266

Trends in incidence and mortality (males)

Figure 5-1. Age-standardised incidence and mortality rates for chronic myeloid leukaemia in males in the period 2001-2010 in England (3 year moving average)

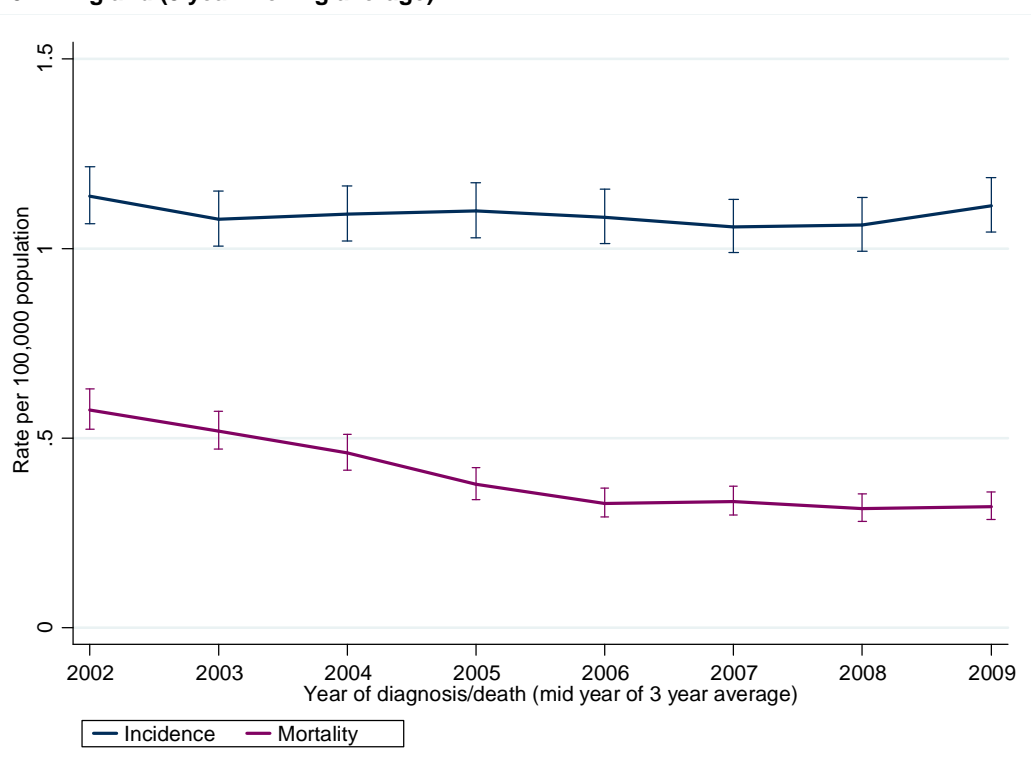


Table 5-1. Age-standardised incidence and mortality rates for chronic myeloid leukaemia in males in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	307	1.1	1.1 1.2	163	0.6	0.5 0.6
2002-2004	299	1.1	1.0 1.2	149	0.5	0.5 0.6
2003-2005	307	1.1	1.0 1.2	136	0.5	0.4 0.5
2004-2006	313	1.1	1.0 1.2	114	0.4	0.3 0.4
2005-2007	310	1.1	1.0 1.2	102	0.3	0.3 0.4
2006-2008	306	1.1	1.0 1.1	105	0.3	0.3 0.4
2007-2009	308	1.1	1.0 1.1	102	0.3	0.3 0.4
2008-2010	328	1.1	1.0 1.2	107	0.3	0.3 0.4

*3 year moving average

Trends in incidence and mortality (females)

Figure 5-2. Age-standardised incidence and mortality rates for chronic myeloid leukaemia in females in the period 2001-2010 in England (3 year moving average)

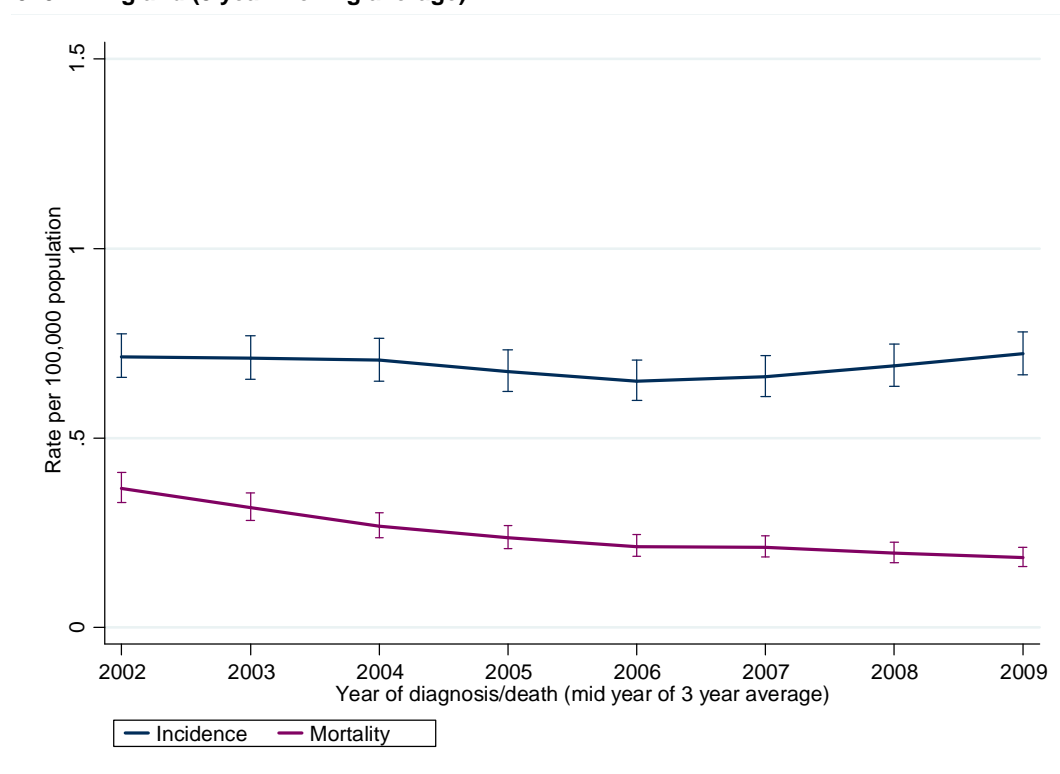


Table 5-2. Age-standardised incidence and mortality rates for chronic myeloid leukaemia in females in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	239	0.7	0.7 0.8	140	0.4	0.3 0.4
2002-2004	236	0.7	0.7 0.8	126	0.3	0.3 0.4
2003-2005	238	0.7	0.7 0.8	110	0.3	0.2 0.3
2004-2006	234	0.7	0.6 0.7	101	0.2	0.2 0.3
2005-2007	230	0.7	0.6 0.7	92	0.2	0.2 0.2
2006-2008	232	0.7	0.6 0.7	96	0.2	0.2 0.2
2007-2009	234	0.7	0.6 0.7	90	0.2	0.2 0.2
2008-2010	243	0.7	0.7 0.8	91	0.2	0.2 0.2

*3 year moving average

Trends in survival (males)

Figure 5-3. Trends in relative survival rates for chronic myeloid leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

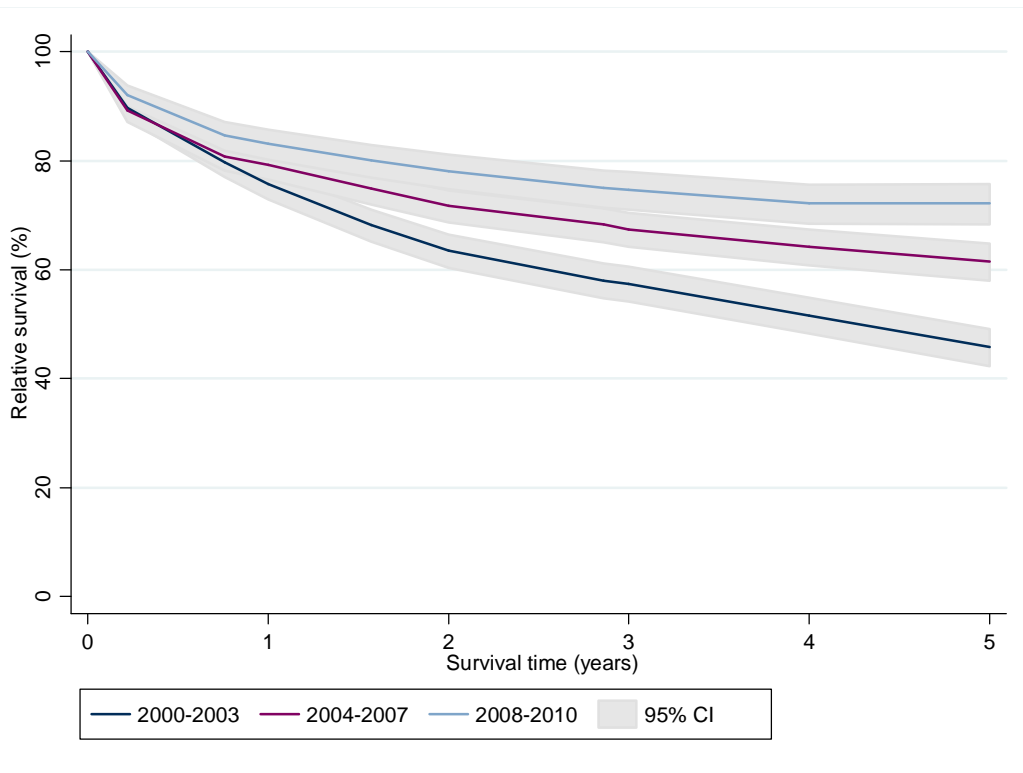


Table 5-3. Trends in relative survival rates for chronic myeloid leukaemia in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010						
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths
1	75.7	72.9	78.3	1192	320	79.3	76.5	81.7	1204	282	83.2	80.2	85.7	998	199
2	63.5	60.4	66.5	1192	480	71.8	68.7	74.6	1204	391	78.1	74.8	81.1	998	266
3	57.4	54.1	60.6	1192	562	67.5	64.2	70.5	1204	461	74.7	71.1	77.9	998	310
4	51.6	48.2	54.9	1192	633	64.2	60.8	67.4	1204	511	72.2	68.5	75.6	998	340
5	45.8	42.3	49.1	1192	696	61.6	58.1	64.9	1204	551	72.2	68.3	75.7	998	360

Trends in survival (females)

Figure 5-4. Trends in relative survival rates for chronic myeloid lymphocytic leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

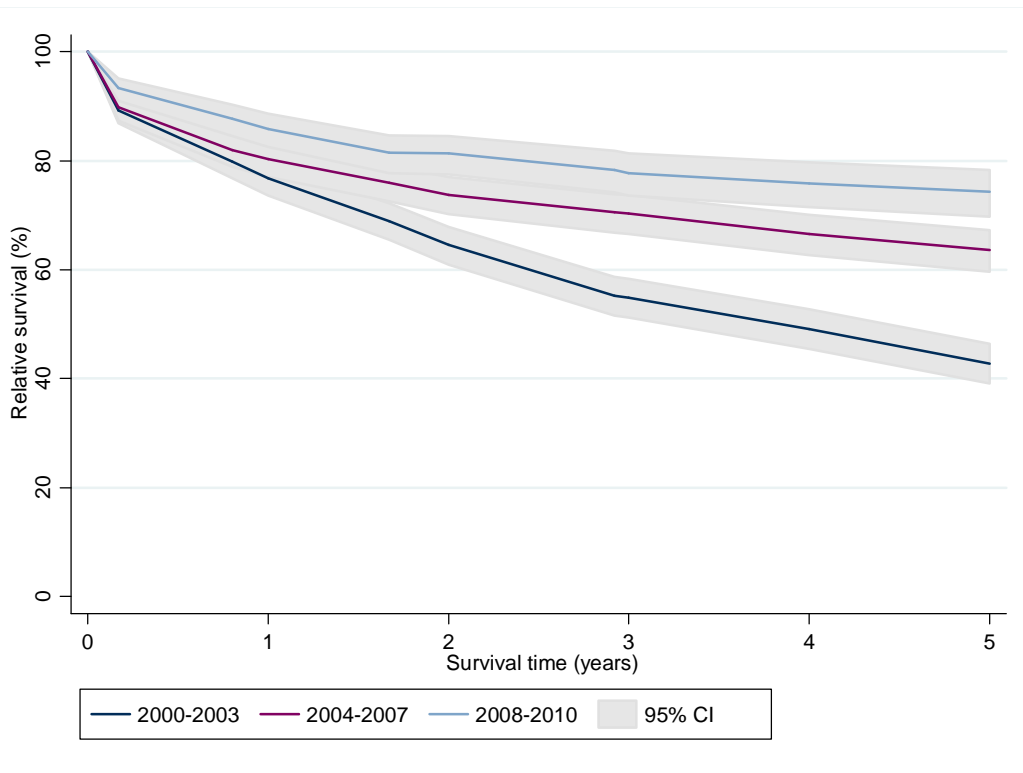


Table 5-4. Trends in relative survival rates for chronic myeloid lymphocytic leukaemia in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003					2004-2007					2008-2010				
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths
1	76.9	73.6	79.7	929	245	80.3	77.1	83.1	875	205	85.9	82.5	88.6	733	129
2	64.6	61.0	67.9	929	369	73.8	70.3	77.0	875	279	81.3	77.5	84.5	733	175
3	54.9	51.2	58.4	929	470	70.3	66.6	73.7	875	326	77.8	73.6	81.3	733	210
4	49.1	45.4	52.8	929	528	66.6	62.7	70.2	875	367	75.9	71.5	79.7	733	234
5	42.8	39.1	46.4	929	587	63.6	59.6	67.3	875	396	74.3	69.7	78.3	733	256

Trends in survival by age (males)

Figure 5-5. Trends in relative survival rates for chronic myeloid leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

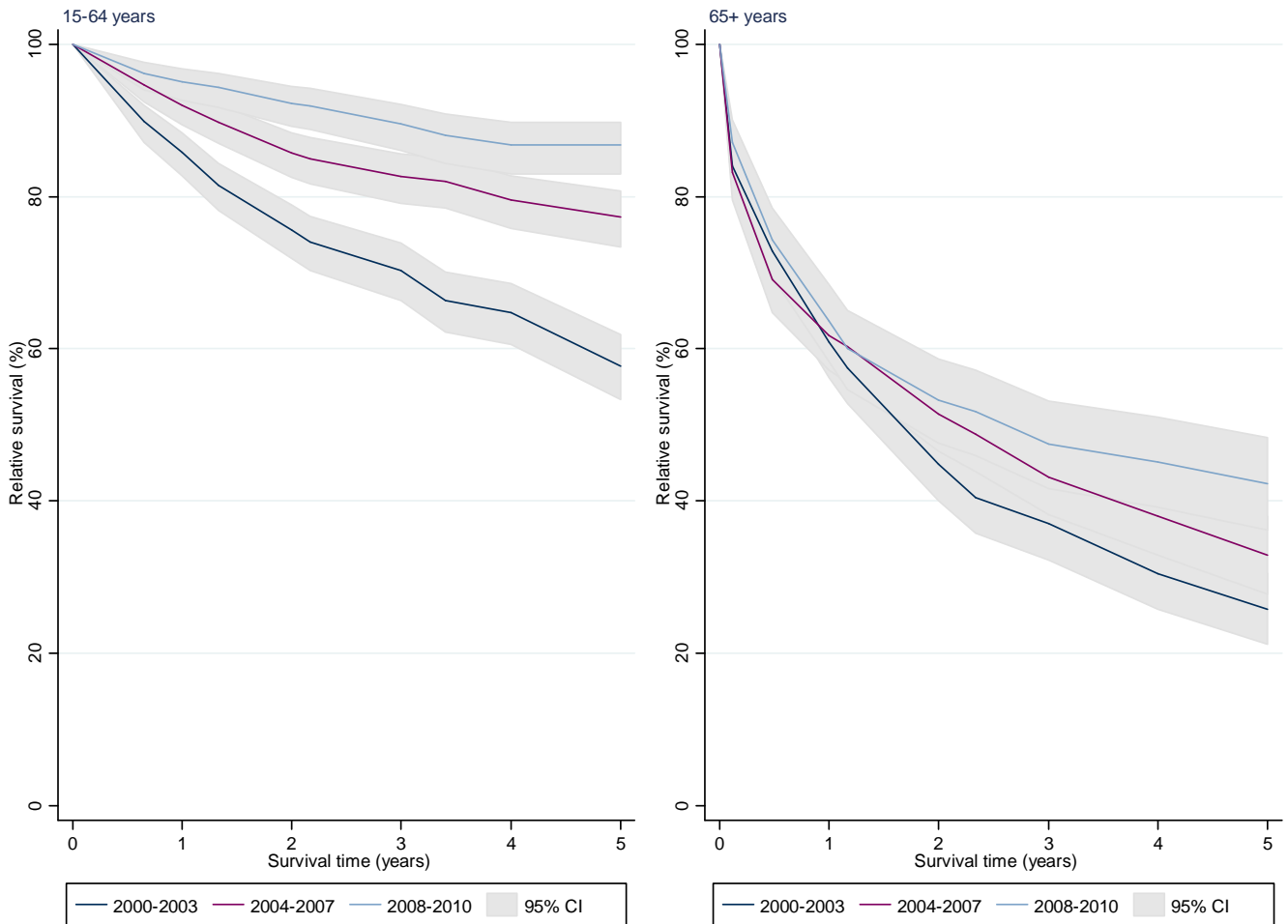


Table 5-5. Trends in relative survival rates for chronic myeloid leukaemia diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	85.8	82.7	88.3	697	91	92.0	89.4	94.0	680	50	95.1	92.7	96.8	598	28
	2	75.6	71.9	78.9	697	155	85.7	82.5	88.4	680	90	92.2	89.2	94.4	598	44
	3	70.3	66.4	73.9	697	188	82.6	79.1	85.6	680	111	89.5	86.0	92.1	598	58
	4	64.7	60.5	68.5	697	220	79.5	75.8	82.8	680	132	86.7	82.9	89.8	598	71
	5	57.7	53.3	61.8	697	258	77.3	73.3	80.7	680	147	86.7	82.9	89.8	598	72
65+ years	1	60.9	56.2	65.3	522	226	61.8	57.1	66.0	555	231	63.6	58.4	68.5	441	171
	2	44.8	40.0	49.5	522	322	51.4	46.6	56.0	555	300	53.3	47.6	58.6	441	222
	3	37.0	32.3	41.8	522	370	43.2	38.2	48.0	555	349	47.5	41.7	53.1	441	252
	4	30.4	25.8	35.2	522	408	38.0	32.9	43.0	555	378	45.1	39.1	50.9	441	269
	5	25.7	21.2	30.5	522	433	32.9	27.8	38.1	555	403	42.3	36.2	48.3	441	288

Trends in survival by age (females)

Figure 5-6. Trends in relative survival rates for chronic myeloid leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

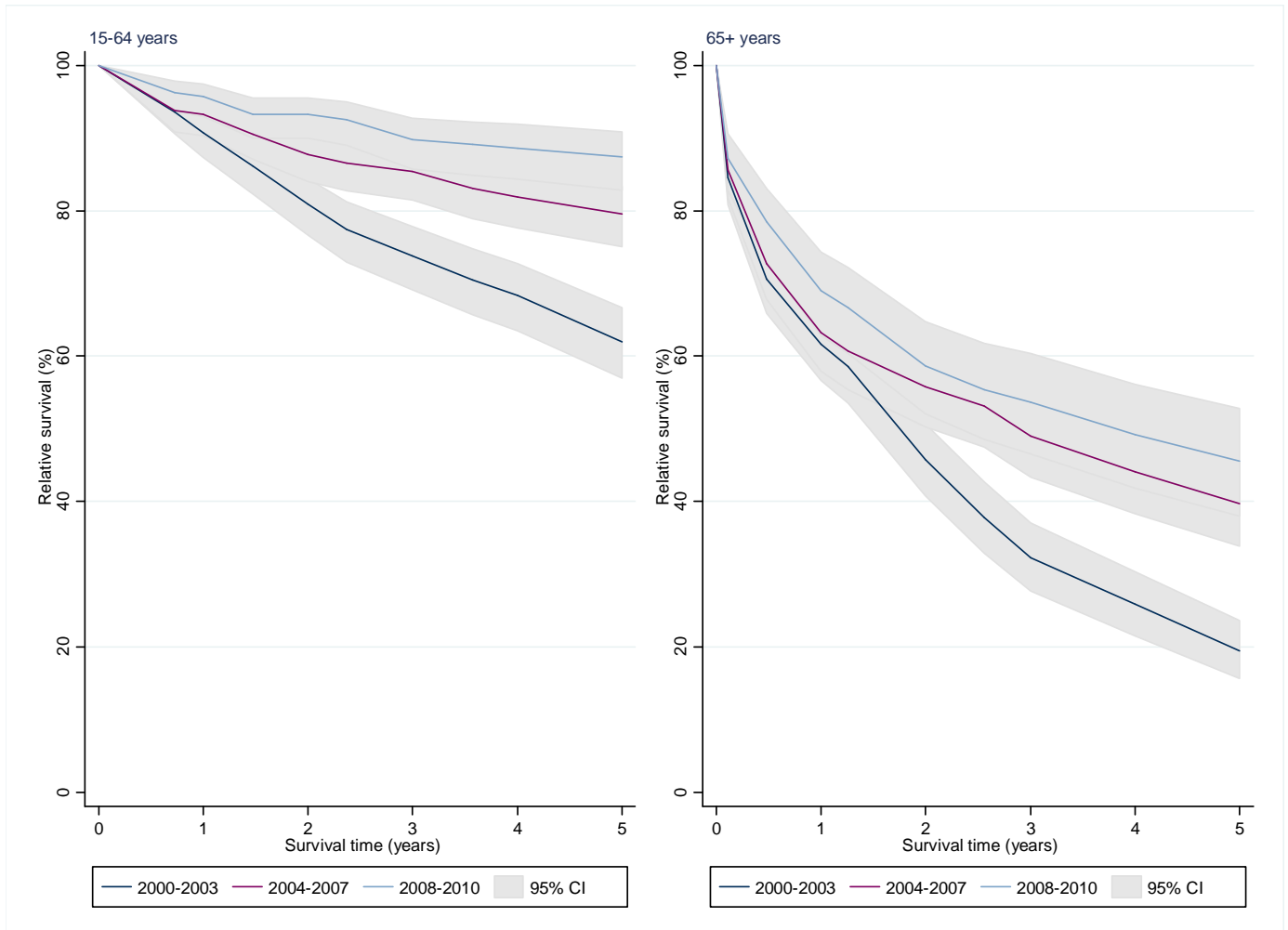


Table 5-6. Trends in relative survival rates for chronic myeloid leukaemia diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003						2004-2007				2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	90.7	87.3	93.2	480	39	93.3	90.3	95.4	482	29	95.7	92.9	97.5	441	17
	2	80.9	76.7	84.5	480	80	87.7	84.0	90.6	482	53	93.3	89.9	95.5	441	26
	3	73.8	69.1	77.8	480	111	85.4	81.4	88.5	482	63	89.8	85.7	92.7	441	38
	4	68.4	63.5	72.7	480	134	81.8	77.6	85.4	482	79	88.6	84.3	91.8	441	43
	5	62.0	56.9	66.7	480	160	79.5	75.0	83.3	482	89	87.4	82.8	90.8	441	48
65+ years	1	61.6	56.6	66.2	480	205	63.2	58.0	68.0	436	176	69.0	62.8	74.3	323	112
	2	45.8	40.8	50.7	480	287	55.7	50.2	60.9	436	223	58.7	52.1	64.7	323	149
	3	32.3	27.7	37.0	480	356	49.0	43.3	54.4	436	260	53.7	46.5	60.3	323	172
	4	25.8	21.5	30.4	480	391	44.1	38.3	49.7	436	285	49.2	41.9	56.1	323	191
	5	19.5	15.7	23.7	480	424	39.7	33.9	45.5	436	303	45.5	38.0	52.8	323	208

Trends in survival by age (persons)

Figure 5-7. Trends in relative survival rates for chronic myeloid leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

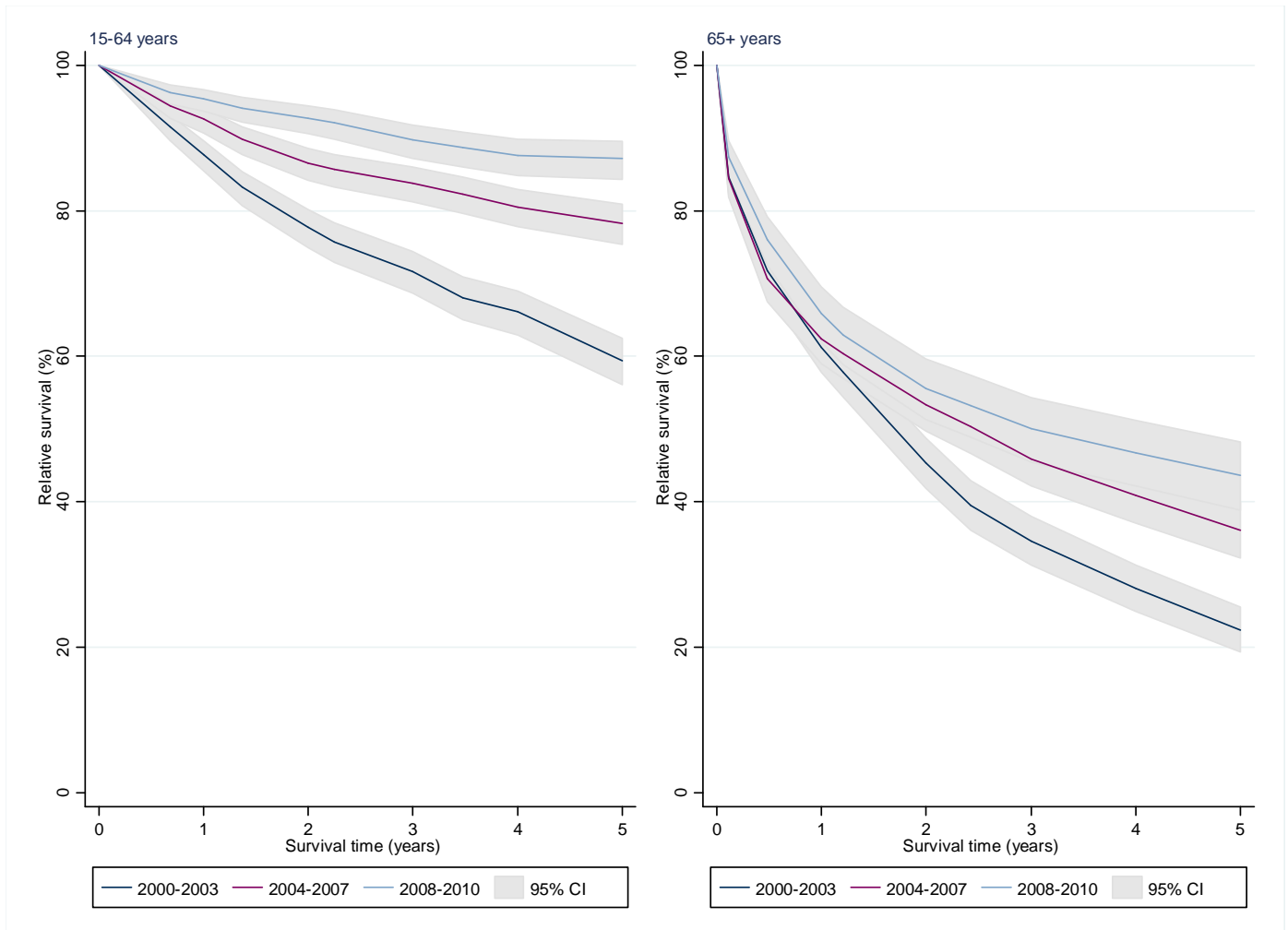


Table 5-7. Trends in relative survival rates for chronic myeloid leukaemia diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	87.7	85.5	89.6	1170	130	92.6	90.7	94.1	1163	79	95.4	93.7	96.7	1038	45
	2	77.7	75.0	80.2	1170	235	86.6	84.2	88.6	1163	143	92.8	90.6	94.4	1038	70
	3	71.6	68.7	74.4	1170	299	83.8	81.3	86.1	1163	174	89.7	87.2	91.8	1038	96
	4	66.1	63.0	69.0	1170	354	80.5	77.8	83.0	1163	211	87.6	84.8	89.9	1038	114
	5	59.4	56.1	62.5	1170	418	78.3	75.4	80.9	1163	236	87.2	84.4	89.5	1038	120
65+ years	1	61.3	57.9	64.5	1002	431	62.4	59.0	65.6	990	407	65.9	61.9	69.5	764	283
	2	45.3	41.9	48.7	1002	609	53.3	49.7	56.8	990	523	55.6	51.3	59.6	764	371
	3	34.6	31.3	38.0	1002	726	45.9	42.2	49.5	990	609	50.0	45.5	54.3	764	424
	4	28.1	24.9	31.4	1002	799	40.8	37.0	44.6	990	663	46.8	42.2	51.2	764	460
	5	22.4	19.4	25.5	1002	857	36.1	32.2	40.0	990	706	43.6	38.9	48.2	764	496

6. Hodgkin lymphoma

The age distribution for Hodgkin lymphoma has two peaks, the first in young adults and the second in old age. In the age range 15-24 years the incidence of disease is higher in females, but at all other ages the disease is more common in males.

Over the period reported, incidence has risen in both males and females. Mortality from Hodgkin lymphoma did not change between 2001 and 2010. Relative survival did not change for females or males in any age group over this time period. Survival is good in children and young adults, but a poorer outcome is seen for elderly patients.

Treatment is with chemotherapy for most patients, radiotherapy with or without chemotherapy for a few. While great advances were made in treatment of this disease in the 1970s and 1980s, progress has slowed since then. For younger patients, where survival is very good, there is considerable interest in minimising any long term adverse effects of treatment.

Trends in incidence and mortality (males)

Figure 6-1. Age-standardised incidence and mortality rates for Hodgkin lymphoma in males in the period 2001-2010 in England (3 year moving average)

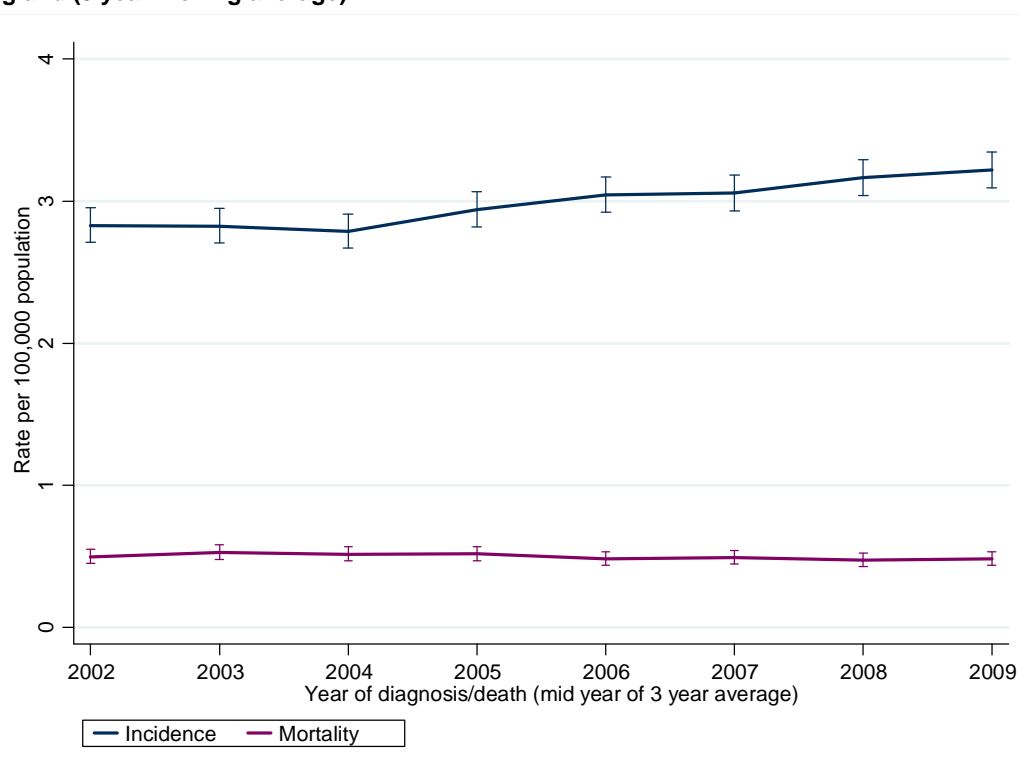


Table 6-1. Age-standardised incidence and mortality rates for Hodgkin lymphoma in males in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	707	2.8	2.7 3.0	135	0.5	0.4 0.5
2002-2004	714	2.8	2.7 2.9	147	0.5	0.5 0.6
2003-2005	715	2.8	2.7 2.9	146	0.5	0.5 0.6
2004-2006	758	2.9	2.8 3.1	148	0.5	0.5 0.6
2005-2007	790	3.0	2.9 3.2	140	0.5	0.4 0.5
2006-2008	800	3.1	2.9 3.2	144	0.5	0.4 0.5
2007-2009	839	3.2	3.0 3.3	142	0.5	0.4 0.5
2008-2010	860	3.2	3.1 3.3	146	0.5	0.4 0.5

*3 year moving average

Trends in incidence and mortality (females)

Figure 6-2. Age-standardised incidence and mortality rates for Hodgkin lymphoma in females in the period 2001-2010 in England (3 year moving average)

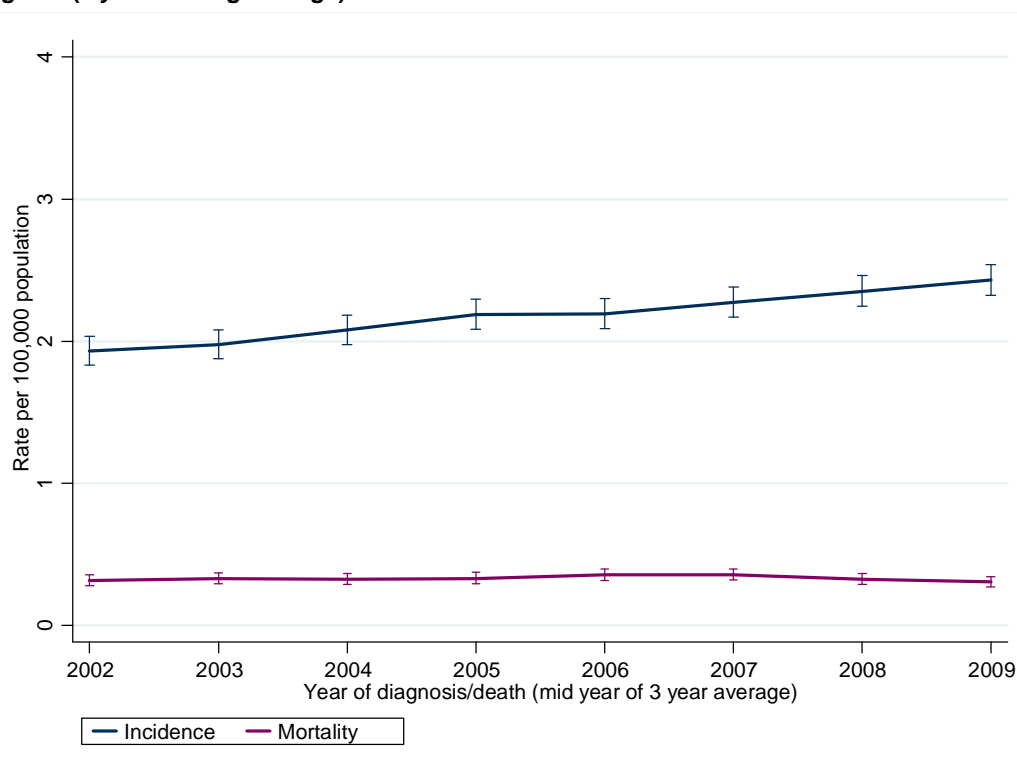


Table 6-2. Age-standardised incidence and mortality rates for Hodgkin lymphoma in females in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	509	1.9	1.8 2.0	103	0.3	0.3 0.4
2002-2004	521	2.0	1.9 2.1	108	0.3	0.3 0.4
2003-2005	552	2.1	2.0 2.2	107	0.3	0.3 0.4
2004-2006	592	2.2	2.1 2.3	111	0.3	0.3 0.4
2005-2007	602	2.2	2.1 2.3	120	0.4	0.3 0.4
2006-2008	627	2.3	2.2 2.4	125	0.4	0.3 0.4
2007-2009	646	2.4	2.2 2.5	117	0.3	0.3 0.4
2008-2010	669	2.4	2.3 2.5	111	0.3	0.3 0.3

*3 year moving average

Trends in survival (males)

Figure 6-3. Trends in relative survival rates for Hodgkin lymphoma in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

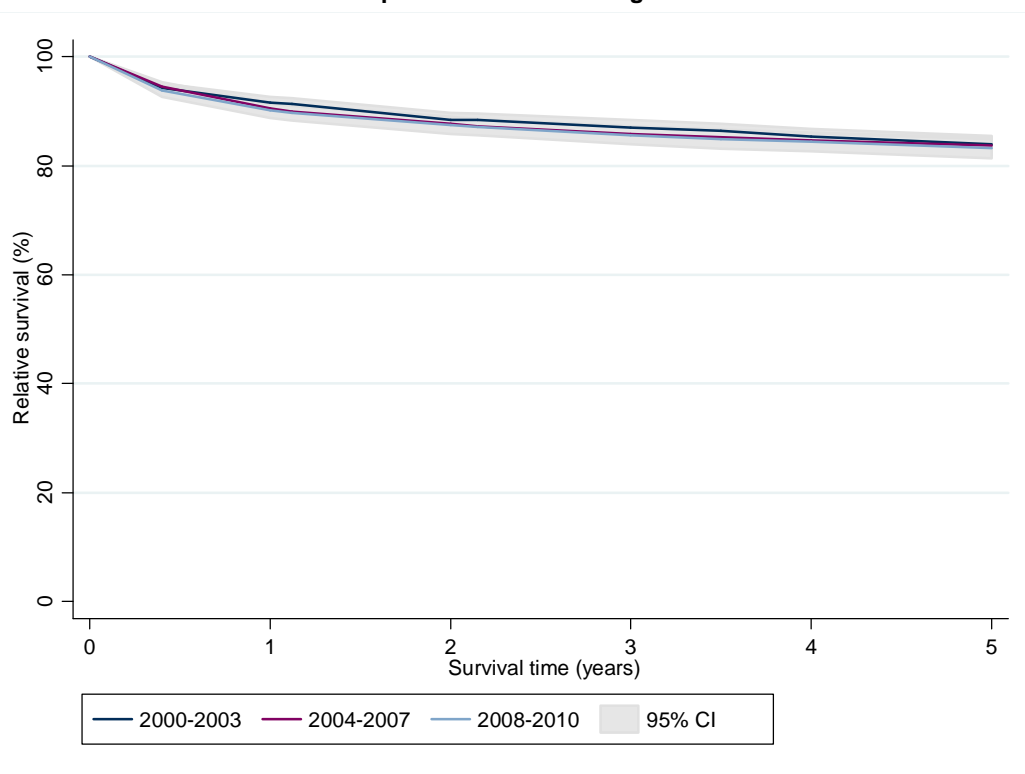


Table 6-3. Trends in relative survival rates for Hodgkin lymphoma in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010						
	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths
1	91.6	90.4	92.7	3099	309	90.5	89.2	91.6	3287	366	90.2	88.8	91.4	2864	315
2	88.5	87.1	89.7	3099	428	87.7	86.3	89.0	3287	482	87.4	85.9	88.8	2864	406
3	87.1	85.6	88.4	3099	497	85.9	84.3	87.2	3287	557	85.7	84.0	87.1	2864	468
4	85.4	83.8	86.8	3099	567	84.7	83.1	86.1	3287	620	84.4	82.7	86.0	2864	515
5	84.0	82.3	85.5	3099	625	83.7	82.1	85.2	3287	676	83.2	81.4	84.8	2864	557

Trends in survival (females)

Figure 6-4. Trends in relative survival rates for Hodgkin lymphoma in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

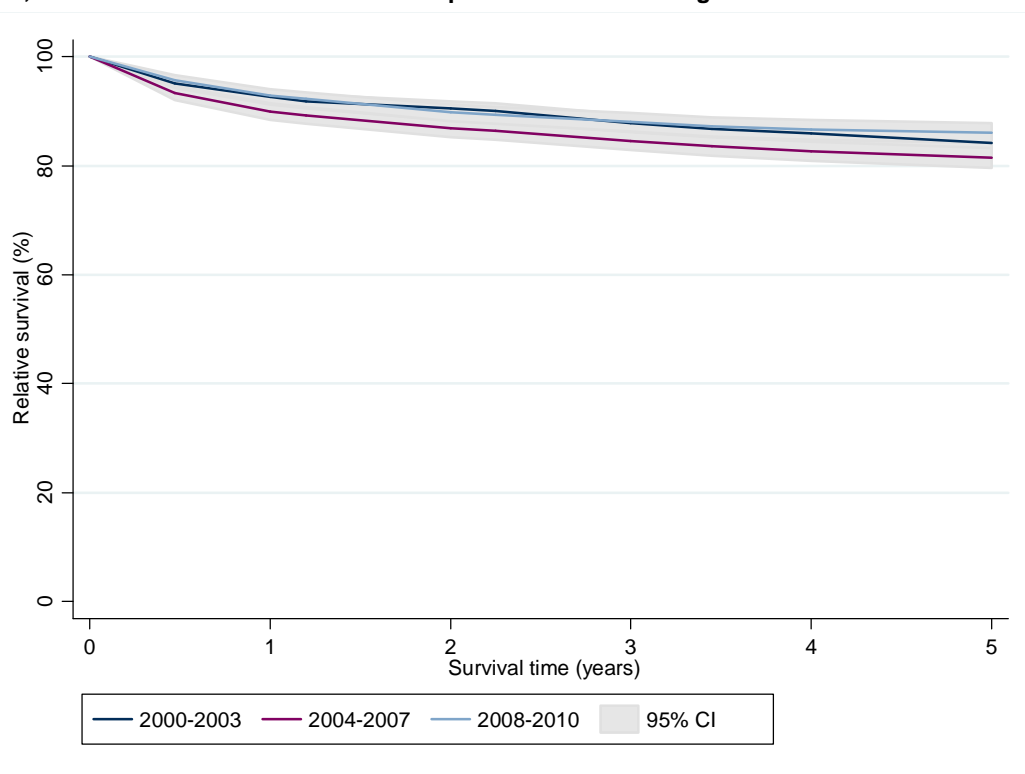


Table 6-4. Trends in relative survival rates for Hodgkin lymphoma in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010			
	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths
1	92.7	91.3 - 93.9	2236	201	89.9	88.5 - 91.2	2563	290	92.9	91.5 - 94.1	2266	186
2	90.5	88.9 - 91.9	2236	275	86.9	85.2 - 88.3	2563	376	89.8	88.2 - 91.3	2266	275
3	87.8	86.1 - 89.4	2236	346	84.6	82.8 - 86.2	2563	442	88.1	86.3 - 89.7	2266	327
4	86.0	84.2 - 87.6	2236	397	82.7	80.9 - 84.4	2563	491	86.7	84.8 - 88.4	2266	364
5	84.2	82.3 - 85.9	2236	446	81.5	79.6 - 83.3	2563	530	86.1	84.1 - 87.8	2266	389

Trends in survival by age (males)

Figure 6-5. Trends in relative survival rates for Hodgkin lymphoma diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

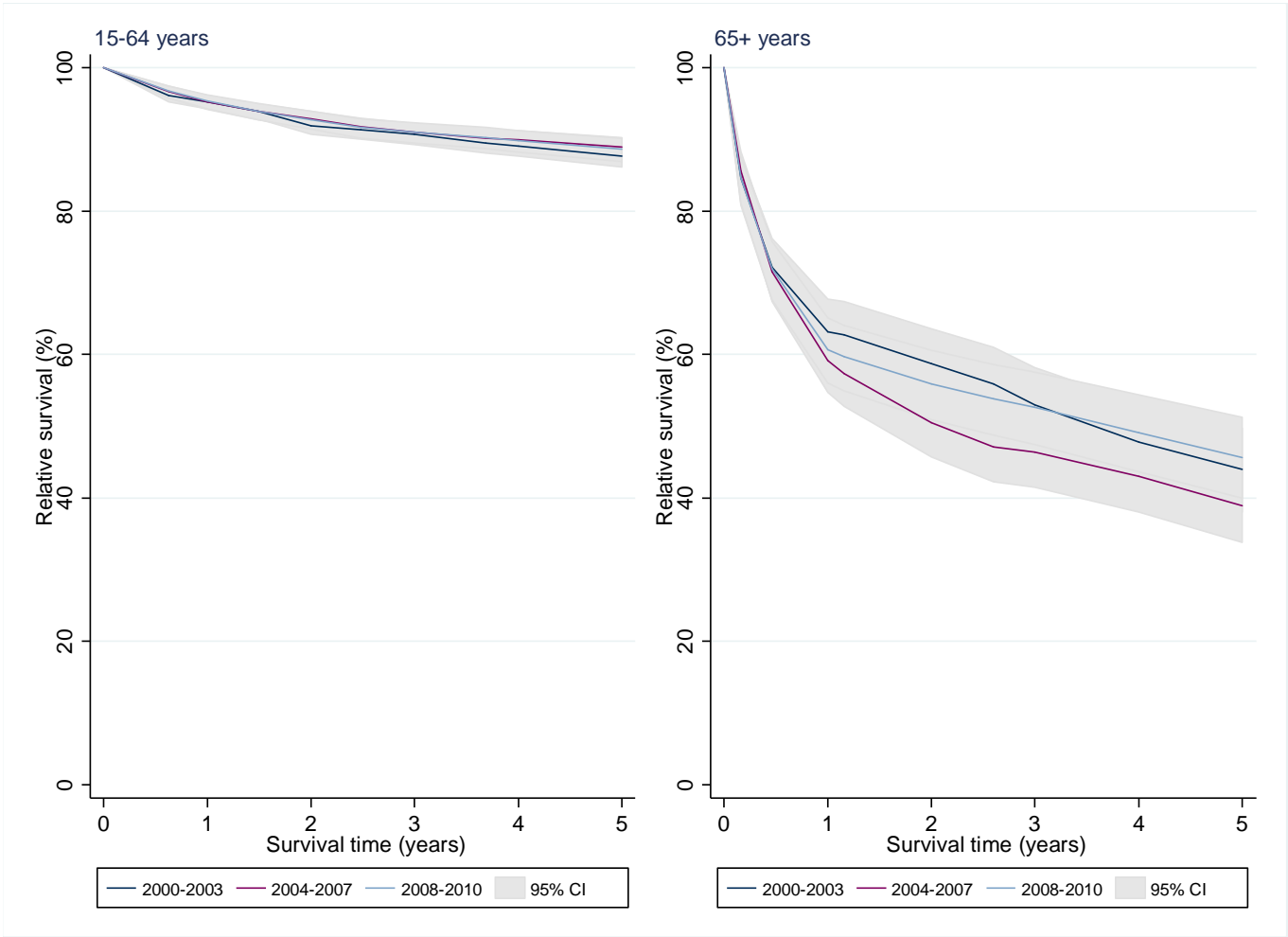


Table 6-5. Trends in relative survival rates for Hodgkin lymphoma diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	95.3	94.3	96.1	2563	120	95.2	94.2	96.1	2621	122	95.4	94.2	96.3	2307	98
	2	91.9	90.7	93.0	2563	206	92.9	91.6	93.9	2621	180	92.8	91.5	94.0	2307	153
	3	90.7	89.3	91.9	2563	241	91.1	89.7	92.3	2621	225	91.0	89.5	92.3	2307	191
	4	89.1	87.7	90.4	2563	282	89.9	88.5	91.2	2621	260	89.8	88.2	91.2	2307	219
	5	87.7	86.1	89.1	2563	320	89.0	87.5	90.3	2621	290	88.6	87.0	90.1	2307	243
65+ years	1	63.2	58.3	67.7	474	184	59.2	54.7	63.5	582	242	60.7	56.1	65.1	543	216
	2	58.7	53.4	63.6	474	217	50.5	45.7	55.0	582	299	55.9	50.9	60.6	543	249
	3	53.0	47.5	58.2	474	250	46.3	41.5	51.1	582	328	52.6	47.4	57.6	543	272
	4	47.8	42.1	53.2	474	277	43.1	38.1	48.0	582	354	49.1	43.7	54.4	543	290
	5	44.0	38.1	49.8	474	296	38.9	33.9	44.0	582	380	45.7	39.9	51.2	543	307

Trends in survival by age (females)

Figure 6-6. Trends in relative survival rates for Hodgkin lymphoma diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

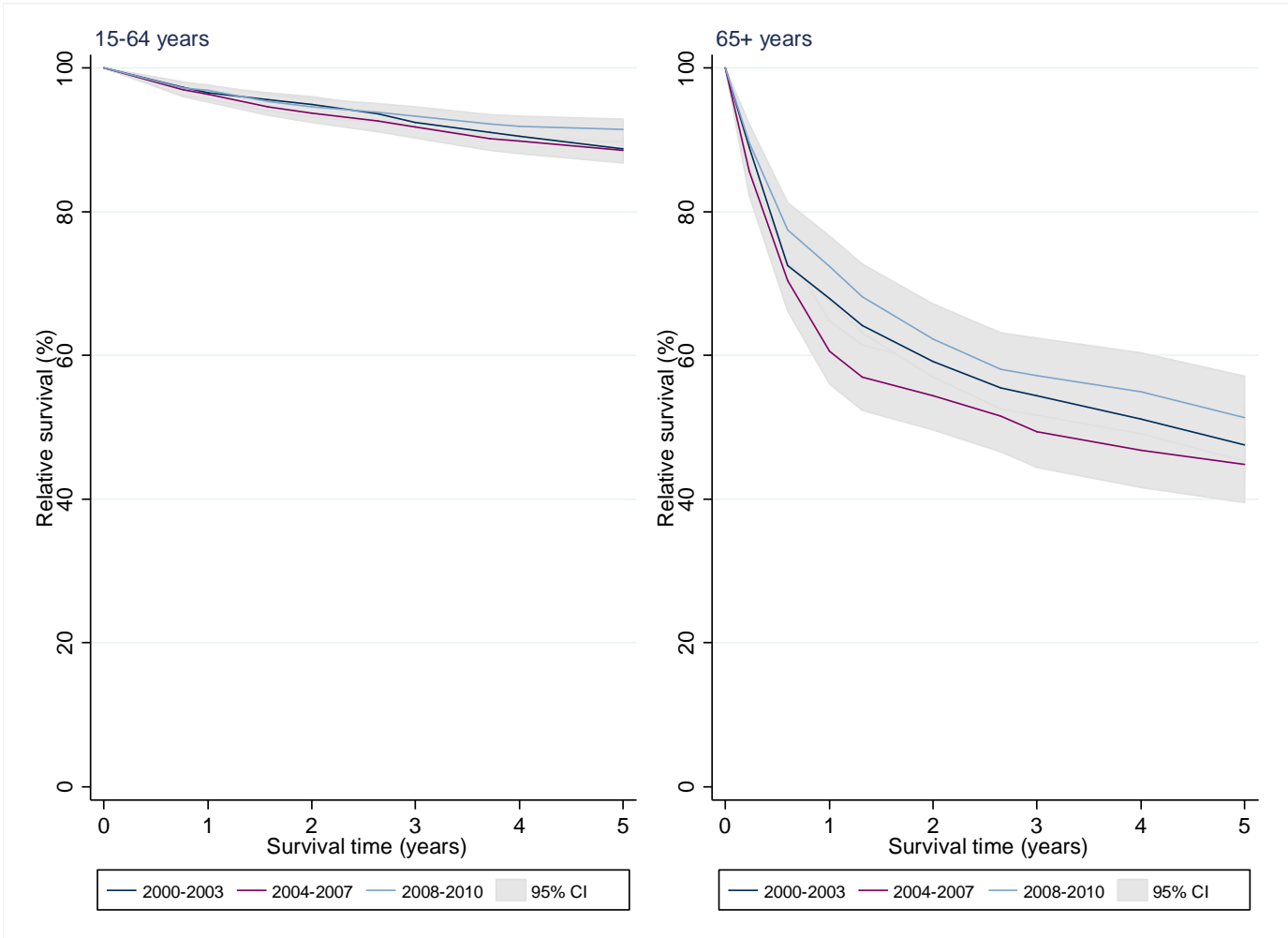


Table 6-6. Trends in relative survival rates for Hodgkin lymphoma diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	96.6	95.5	97.4	1812	58	96.3	95.3	97.2	1987	68	96.8	95.7	97.6	1824	53
	2	94.9	93.7	96.0	1812	86	93.8	92.4	94.9	1987	113	94.6	93.2	95.7	1824	86
	3	92.5	91.0	93.7	1812	130	91.8	90.2	93.1	1987	148	93.3	91.8	94.6	1824	105
	4	90.5	88.9	92.0	1812	163	89.8	88.1	91.2	1987	180	91.9	90.3	93.3	1824	125
	5	88.8	87.0	90.3	1812	194	88.5	86.8	90.1	1987	205	91.5	89.8	92.9	1824	133
65+ years	1	67.9	62.7	72.5	423	143	60.6	56.0	64.8	569	221	72.3	67.5	76.6	456	133
	2	59.2	53.7	64.3	423	188	54.4	49.6	59.0	569	258	62.3	57.0	67.1	456	189
	3	54.4	48.7	59.7	423	213	49.5	44.4	54.3	569	287	57.2	51.7	62.4	456	219
	4	51.2	45.2	56.8	423	231	46.8	41.6	51.8	569	304	54.9	49.1	60.4	456	235
	5	47.6	41.5	53.5	423	248	44.8	39.5	50.0	569	318	51.4	45.3	57.1	456	251

Trends in survival by age (persons)

Figure 6-7. Trends in relative survival rates for Hodgkin lymphoma diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

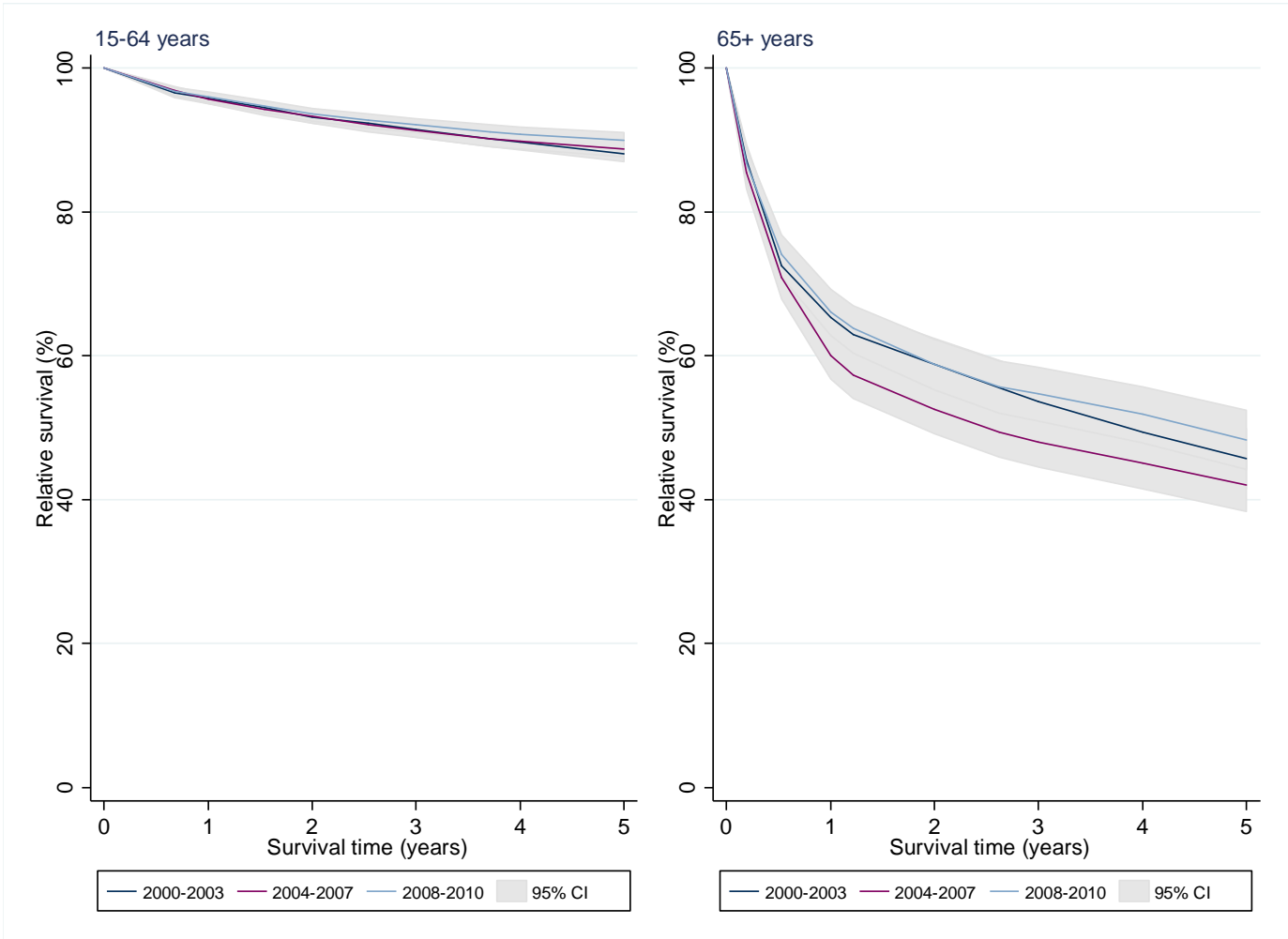


Table 6-7. Trends in relative survival rates for Hodgkin lymphoma diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	95.8	95.1	96.4	4368	178	95.7	95.0	96.3	4610	190	96.0	95.3	96.7	4129	151
	2	93.2	92.3	94.0	4368	292	93.3	92.4	94.1	4610	293	93.6	92.7	94.4	4129	239
	3	91.4	90.4	92.3	4368	371	91.4	90.4	92.3	4610	373	92.1	91.0	93.0	4129	296
	4	89.7	88.6	90.7	4368	445	89.9	88.8	90.8	4610	440	90.8	89.7	91.8	4129	344
	5	88.1	87.0	89.2	4368	514	88.8	87.7	89.8	4610	495	89.9	88.7	91.0	4129	376
65+ years	1	65.3	61.8	68.6	902	327	60.0	56.8	63.0	1151	463	66.1	62.8	69.3	1000	349
	2	58.8	55.0	62.4	902	405	52.5	49.2	55.8	1151	557	58.8	55.2	62.3	1000	438
	3	53.6	49.7	57.4	902	463	48.0	44.5	51.4	1151	615	54.8	51.0	58.4	1000	491
	4	49.4	45.3	53.3	902	508	45.1	41.5	48.6	1151	658	51.9	47.9	55.7	1000	525
	5	45.7	41.5	49.9	902	544	42.0	38.3	45.7	1151	698	48.4	44.2	52.4	1000	558

7. Non-Hodgkin lymphoma

Non-Hodgkin lymphoma (NHL) is not one but several diseases. In this report they have been analysed together, but each of the different NHLs has different behaviour, prognosis and treatment, and observed changes in incidence or outcome are unlikely to apply to all forms of NHL.

The incidence of NHL increases with age, with most cases occurring in the elderly; incidence rates are higher in men at all ages. Age-standardised incidence rates rose over the period reported in men and women and age-standardised mortality fell.

Relative survival improved over the period reported in both sexes and across all ages. There was an increase in relative survival at 5 years among males (all ages) from 54% (95% CI: 53-55%) for individuals diagnosed in 2000-03 to 65% (95% CI: 64-66%) for those diagnosed in 2008-10. Among female patients (all ages) with NHL there was an increase in relative survival at 5 years from 56% (95% CI: 55-56%) for individuals diagnosed in 2000-03 to 67% (95% CI: 66-68%) for those diagnosed in 2008-10.

The improvement in survival is most likely to be due to the introduction of rituximab, which is now used in the treatment of the two commonest lymphomas: Diffuse large B cell lymphoma (DLBCL) and follicular lymphoma (FL) as well as some of the less common lymphomas. This drug was licensed in 1997 (USA) and 1998 (UK) and its use has increased as evidence of benefit in FL and DLBCL emerged.

NICE has released a number of Technology Appraisals (TAs), which have led to the widespread use of this drug in combination with other older chemotherapy drugs. This treatment will have begun to have an effect on survival during the period analysed in this report. It is likely that the improvement in survival has increased since then.

Registration rates for NHL have been rising since the 1970's; it is not clear exactly what the determinants of this apparent increase in incidence are. But it is important to recognise that improvements in the ascertainment of these cancers, with changing thresholds for diagnosis and greater access to diagnostic testing particularly in the elderly, is likely to contribute at least in part to this trend.

Trends in incidence and mortality (males)

Figure 7-1. Age-standardised incidence and mortality rates for Non-Hodgkin lymphoma in males in the period 2001-2010 in England (3 year moving average)

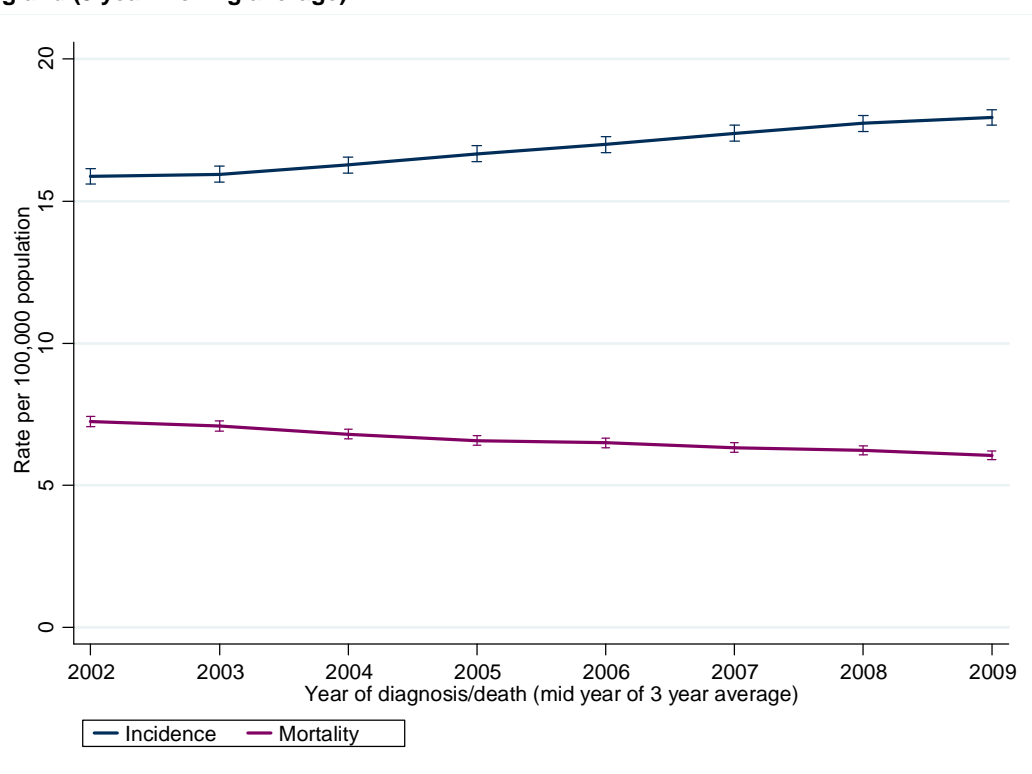


Table 7-1. Age-standardised incidence and mortality rates for Non-Hodgkin lymphoma in males in the period 2001-2010 in England (3 year moving average)

Year	Incidence				Mortality			
	Cases*	ASR	95% CI		Deaths*	ASR	95% CI	
2001-2003	4361	15.9	15.6	16.1	2073	7.3	7.1	7.4
2002-2004	4447	15.9	15.7	16.2	2056	7.1	6.9	7.3
2003-2005	4597	16.3	16.0	16.5	2011	6.8	6.6	7.0
2004-2006	4772	16.7	16.4	16.9	1983	6.6	6.4	6.7
2005-2007	4936	17.0	16.7	17.3	2010	6.5	6.3	6.7
2006-2008	5132	17.4	17.1	17.7	2012	6.3	6.2	6.5
2007-2009	5343	17.7	17.5	18.0	2030	6.2	6.1	6.4
2008-2010	5499	17.9	17.7	18.2	2024	6.1	5.9	6.2

*3 year moving average

Trends in incidence and mortality (females)

Figure 7-2. Age-standardised incidence and mortality rates for Non-Hodgkin lymphoma in females in the period 2001-2010 in England (3 year moving average)

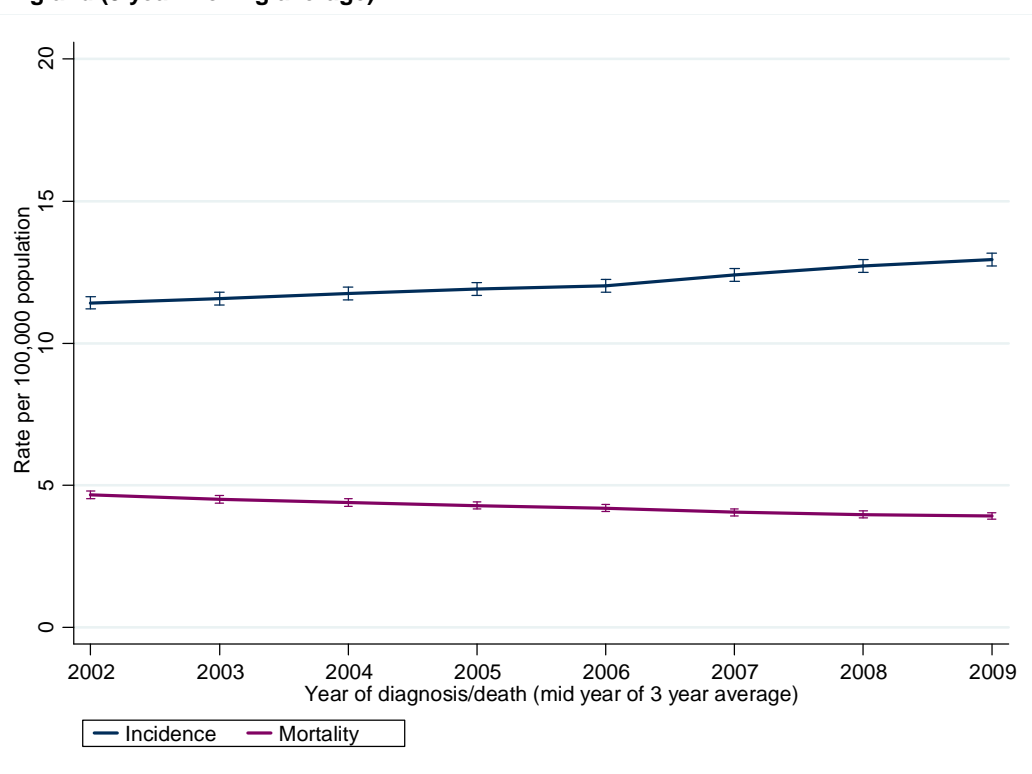


Table 7-2. Age-standardised incidence and mortality rates for Non-Hodgkin lymphoma in females in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	3874	11.4	11.2 11.6	1818	4.7	4.5 4.8
2002-2004	3950	11.6	11.3 11.8	1796	4.5	4.4 4.6
2003-2005	4034	11.7	11.5 12.0	1767	4.4	4.3 4.5
2004-2006	4105	11.9	11.7 12.1	1748	4.3	4.2 4.4
2005-2007	4184	12.0	11.8 12.3	1742	4.2	4.1 4.3
2006-2008	4379	12.4	12.2 12.6	1724	4.0	3.9 4.2
2007-2009	4549	12.7	12.5 12.9	1713	4.0	3.9 4.1
2008-2010	4680	12.9	12.7 13.2	1706	3.9	3.8 4.0

*3 year moving average

Trends in survival (males)

Figure 7-3. Trends in relative survival rates for Non-Hodgkin lymphoma in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

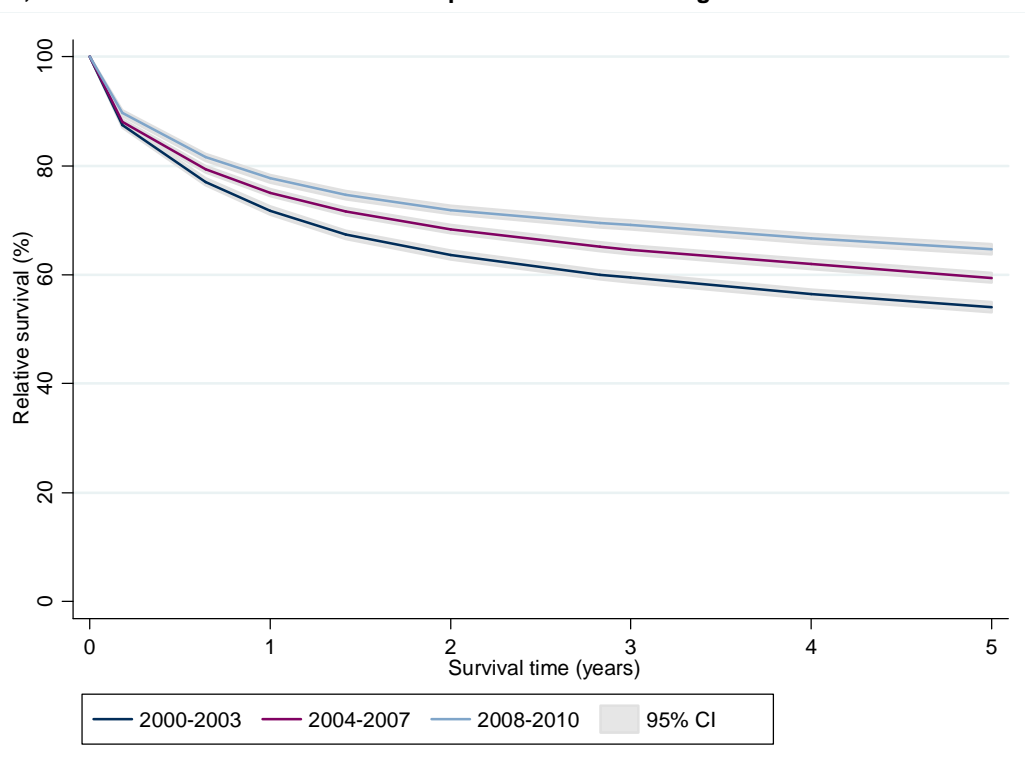


Table 7-3. Trends in relative survival rates for Non-Hodgkin lymphoma in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003				2004-2007				2008-2010			
	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths	RS	95 % CI	Cohort	Deaths
1	71.8	71.0 72.5	17230	5150	75.1	74.4 75.7	19380	5177	77.7	77.0 78.4	16872	4070
2	63.6	62.8 64.5	17230	6751	68.4	67.6 69.1	19380	6707	71.9	71.1 72.7	16872	5272
3	59.5	58.6 60.3	17230	7666	64.6	63.8 65.4	19380	7623	69.1	68.3 70.0	16872	5974
4	56.5	55.6 57.4	17230	8346	62.0	61.1 62.8	19380	8307	66.7	65.8 67.5	16872	6555
5	54.0	53.1 54.9	17230	8863	59.5	58.6 60.3	19380	8914	64.8	63.8 65.7	16872	7033

Trends in survival (females)

Figure 7-4. Trends in relative survival rates for Non-Hodgkin lymphoma in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

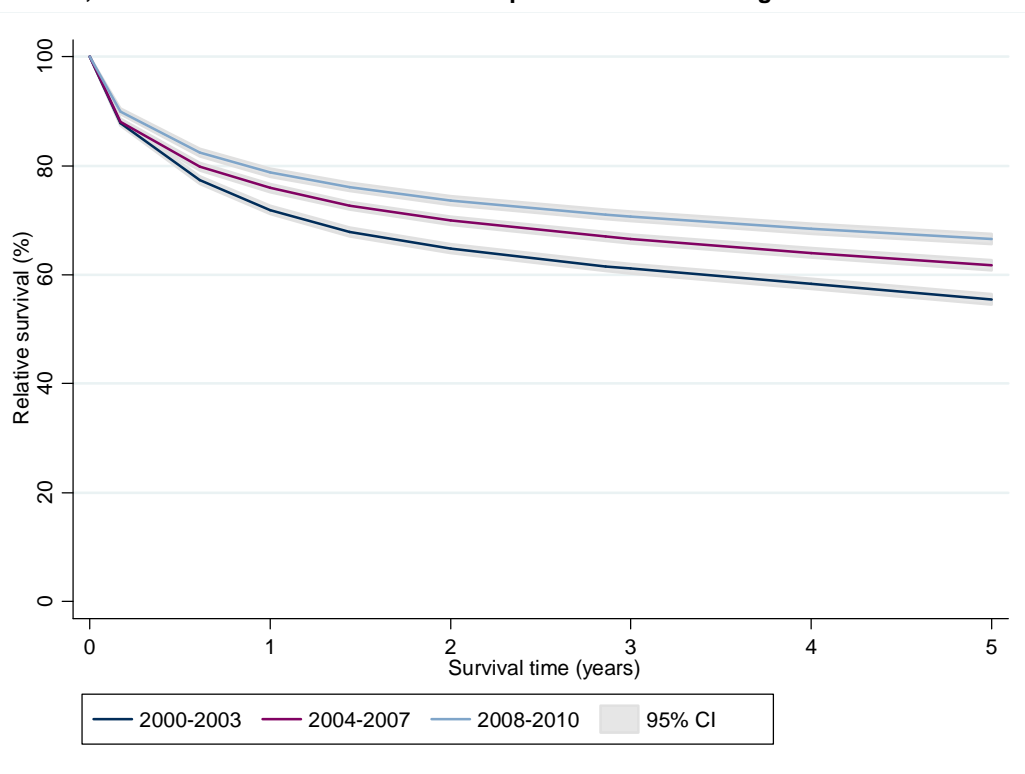


Table 7-4. Trends in relative survival rates for Non-Hodgkin lymphoma in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003					2004-2007					2008-2010				
	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths	RS	95 % CI		Cohort	Deaths
1	71.9	71.1	72.7	15243	4535	75.9	75.2	76.6	16545	4296	78.8	78.0	79.5	14318	3280
2	64.8	64.0	65.7	15243	5788	69.9	69.1	70.7	16545	5488	73.7	72.8	74.5	14318	4188
3	61.2	60.3	62.0	15243	6527	66.6	65.7	67.4	16545	6241	70.7	69.8	71.6	14318	4773
4	58.4	57.5	59.3	15243	7077	64.0	63.1	64.9	16545	6826	68.5	67.5	69.4	14318	5232
5	55.5	54.5	56.4	15243	7589	61.8	60.8	62.7	16545	7331	66.6	65.6	67.5	14318	5616

Trends in survival by age (males)

Figure 7-5. Trends in relative survival rates for Non-Hodgkin lymphoma diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

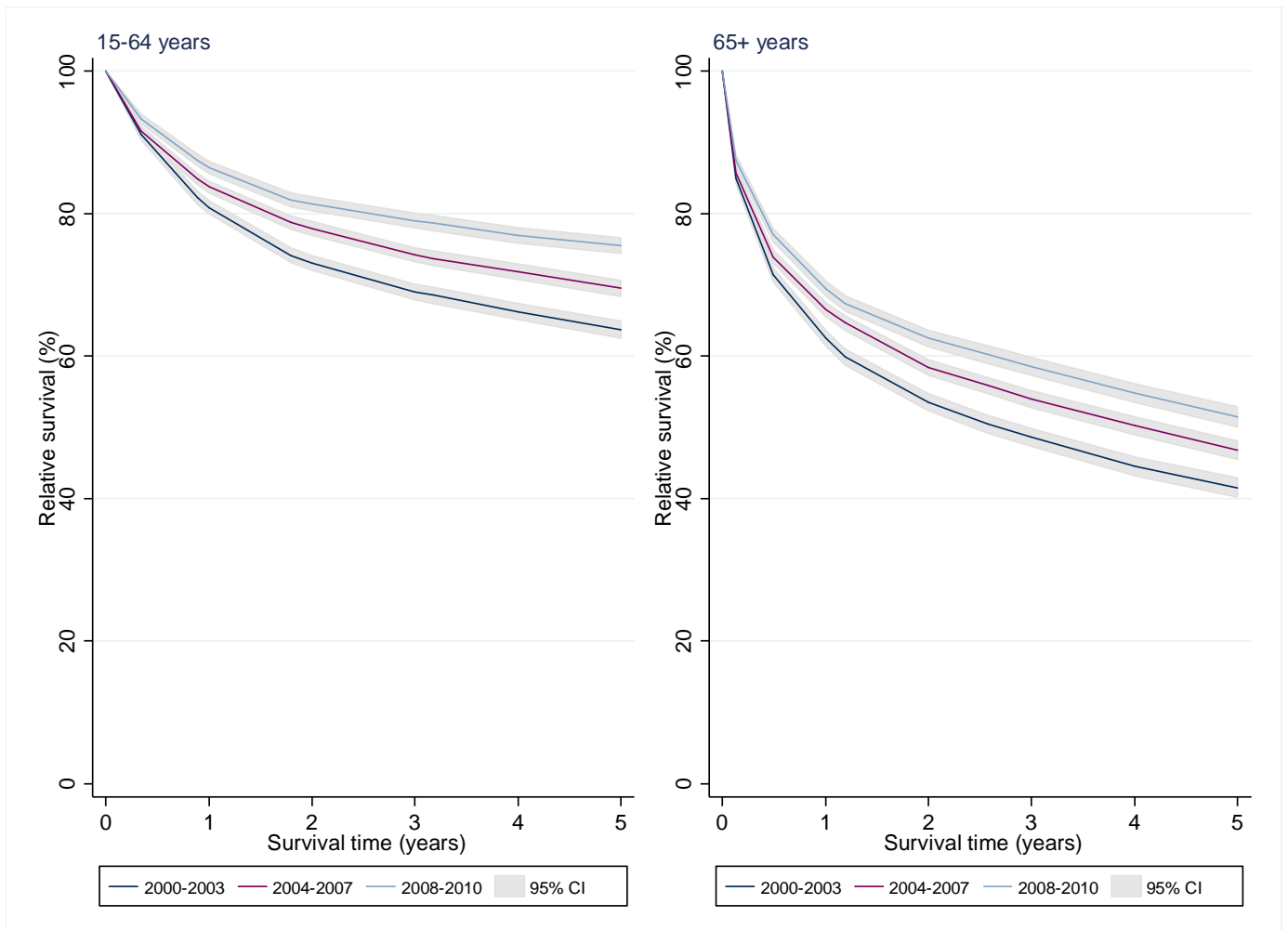


Table 7-5. Trends in relative survival rates for Non-Hodgkin lymphoma diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	80.9	79.9	81.8	8022	1454	83.7	82.9	84.5	8743	1348	86.5	85.6	87.3	7423	935
	2	73.1	72.0	74.1	8022	2057	77.9	77.0	78.8	8743	1835	81.4	80.4	82.3	7423	1301
	3	69.1	67.9	70.1	8022	2389	74.2	73.2	75.2	8743	2147	79.0	78.0	80.1	7423	1482
	4	66.3	65.1	67.4	8022	2618	71.9	70.8	72.9	8743	2361	77.0	75.9	78.1	7423	1640
	5	63.8	62.6	64.9	8022	2816	69.5	68.4	70.6	8743	2567	75.6	74.4	76.7	7423	1756
65+ years	1	62.6	61.5	63.6	9202	3671	66.5	65.5	67.5	10577	3812	69.5	68.4	70.5	9474	3121
	2	53.5	52.3	54.7	9202	4660	58.4	57.3	59.5	10577	4846	62.5	61.3	63.6	9474	3954
	3	48.6	47.4	49.9	9202	5239	53.9	52.8	55.1	10577	5449	58.5	57.3	59.8	9474	4473
	4	44.5	43.2	45.8	9202	5690	50.3	49.0	51.5	10577	5918	54.9	53.5	56.2	9474	4895
	5	41.6	40.2	42.9	9202	6007	46.9	45.5	48.1	10577	6318	51.4	50.0	52.8	9474	5257

Trends in survival by age (females)

Figure 7-6. Trends in relative survival rates for Non-Hodgkin lymphoma diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

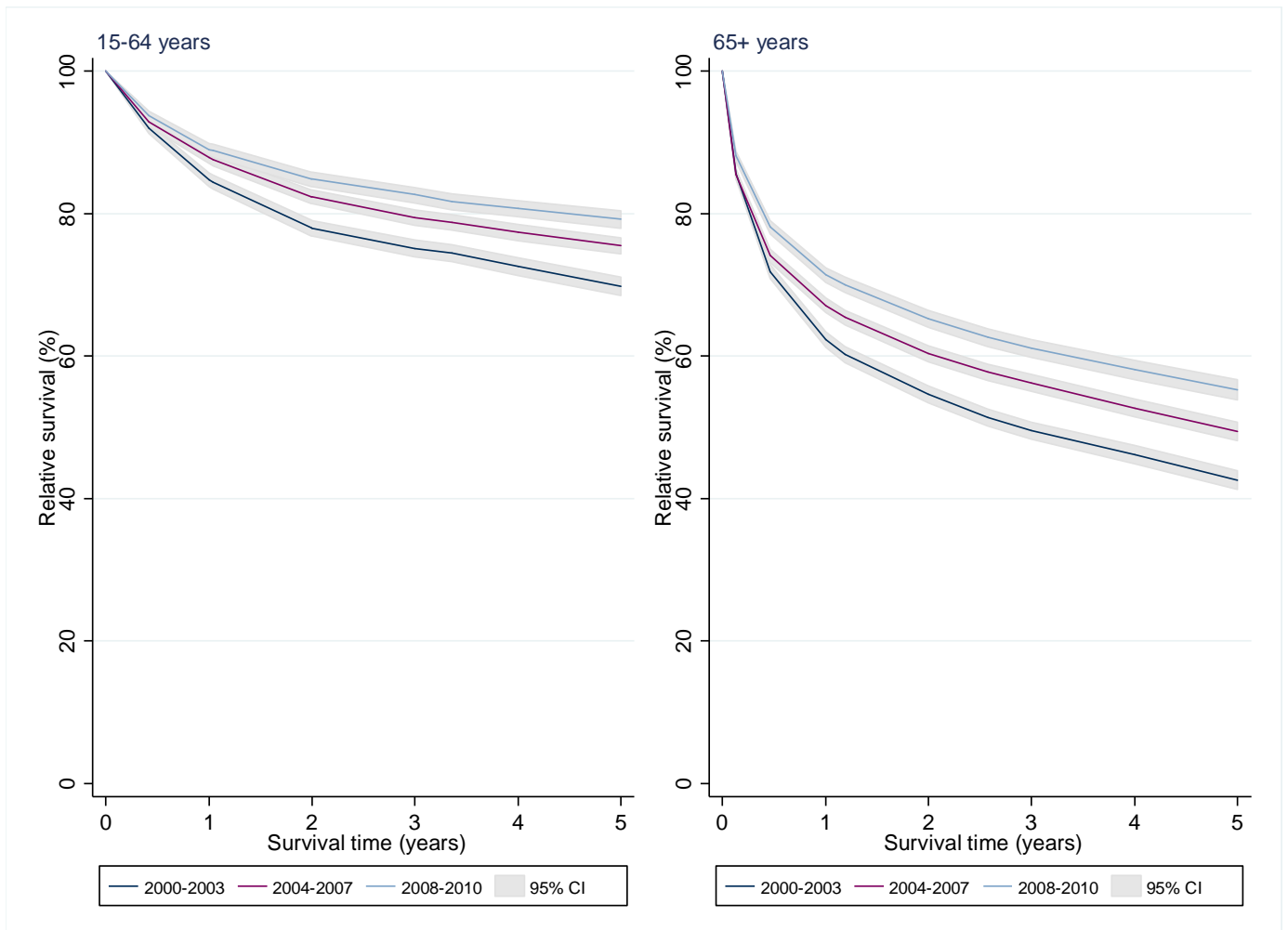


Table 7-6. Trends in relative survival rates for Non-Hodgkin lymphoma diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	84.7	83.8	85.7	6184	879	87.9	87.0	88.7	6690	754	89.0	88.1	89.9	5694	565
	2	78.0	76.8	79.1	6184	1275	82.4	81.4	83.4	6690	1094	84.8	83.7	85.8	5694	787
	3	75.1	73.9	76.3	6184	1450	79.4	78.3	80.5	6690	1285	82.6	81.5	83.7	5694	908
	4	72.6	71.3	73.8	6184	1605	77.4	76.2	78.5	6690	1422	80.7	79.5	81.8	5694	1015
	5	69.8	68.5	71.1	6184	1755	75.5	74.3	76.6	6690	1548	79.2	77.9	80.4	5694	1100
65+ years	1	62.3	61.3	63.4	9227	3641	67.1	66.1	68.1	9988	3533	71.4	70.3	72.4	8839	2714
	2	54.6	53.4	55.8	9227	4496	60.3	59.2	61.4	9988	4382	65.2	64.1	66.4	8839	3399
	3	49.5	48.3	50.7	9227	5060	56.2	55.1	57.4	9988	4944	61.1	59.8	62.3	8839	3863
	4	46.2	44.9	47.4	9227	5454	52.7	51.5	53.9	9988	5391	58.0	56.7	59.4	8839	4215
	5	42.6	41.3	43.8	9227	5816	49.4	48.1	50.7	9988	5770	55.3	53.9	56.7	8839	4514

Trends in survival by age (persons)

Figure 7-7. Trends in relative survival rates for Non-Hodgkin lymphoma diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

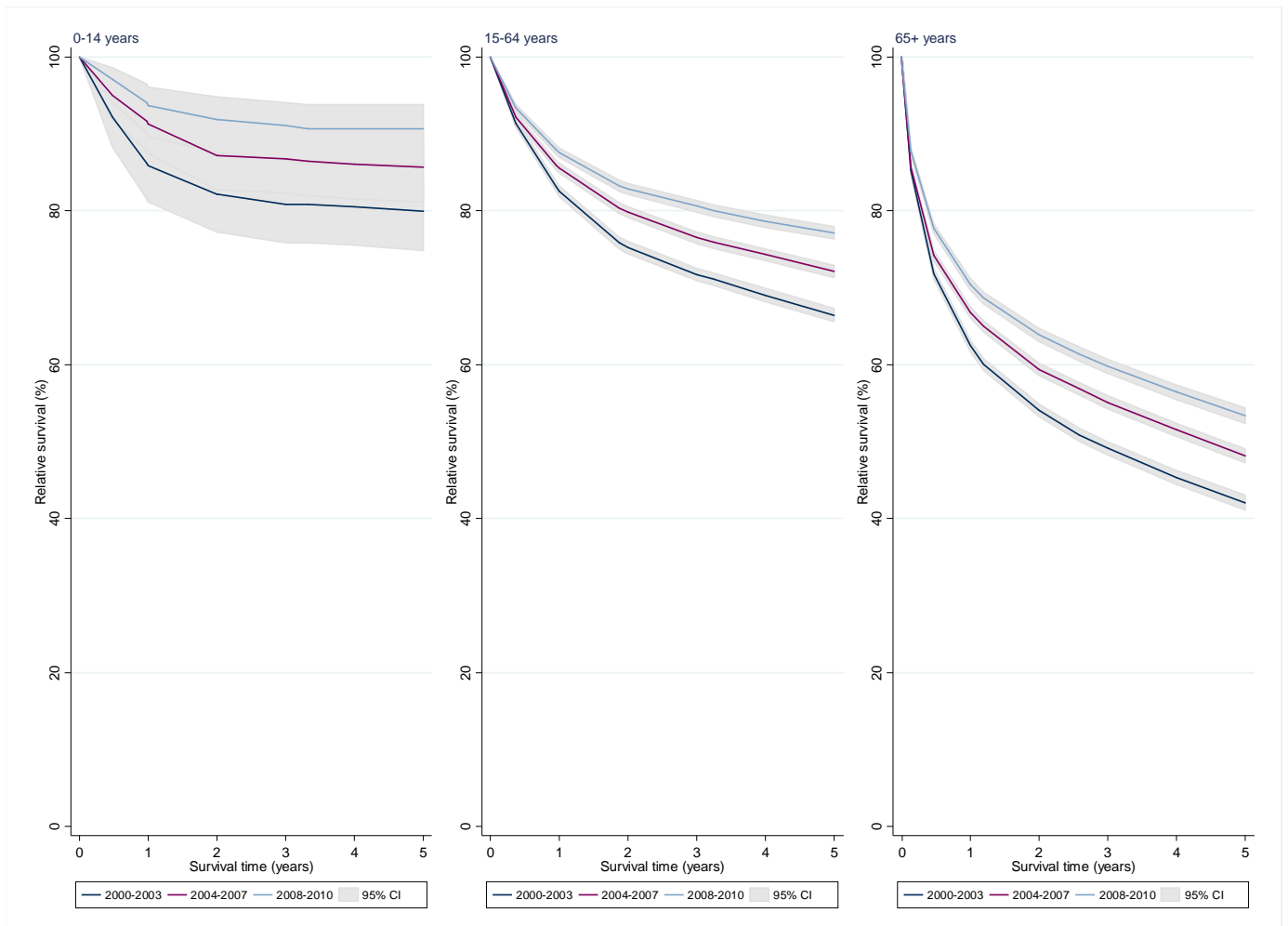


Table 7-7. Trends in relative survival rates for Non-Hodgkin lymphoma diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
0 - 14 years	1	85.8	81.2	89.4	328	40	91.3	87.5	94.0	337	26	93.6	89.6	96.1	287	15
	2	82.2	77.2	86.1	328	51	87.1	82.7	90.5	337	38	91.9	87.6	94.8	287	19
	3	80.9	75.8	85.0	328	55	86.8	82.3	90.2	337	39	91.1	86.6	94.1	287	21
	4	80.6	75.5	84.7	328	56	86.0	81.5	89.6	337	41	91.1	86.6	94.1	287	21
	5	79.9	74.8	84.1	328	58	85.7	81.1	89.2	337	42	91.1	86.6	94.1	287	21
15 - 64 years	1	82.6	81.9	83.2	14187	2333	85.5	84.9	86.1	15433	2102	87.6	87.0	88.2	13092	1500
	2	75.2	74.5	76.0	14187	3332	79.9	79.2	80.5	15433	2929	82.9	82.1	83.6	13092	2088
	3	71.7	70.9	72.5	14187	3839	76.5	75.8	77.2	15433	3432	80.6	79.8	81.4	13092	2390
	4	69.0	68.2	69.9	14187	4223	74.3	73.5	75.0	15433	3783	78.6	77.8	79.4	13092	2655
	5	66.5	65.6	67.3	14187	4571	72.2	71.3	73.0	15433	4115	77.1	76.3	78.0	13092	2856
65+ years	1	62.4	61.7	63.2	18429	7312	66.8	66.1	67.5	20565	7345	70.4	69.7	71.2	18313	5835
	2	54.1	53.2	54.9	18429	9156	59.4	58.6	60.1	20565	9228	63.9	63.0	64.7	18313	7353
	3	49.1	48.2	50.0	18429	10299	55.1	54.3	55.9	20565	10393	59.8	58.9	60.7	18313	8336
	4	45.4	44.5	46.3	18429	11144	51.5	50.6	52.4	20565	11309	56.5	55.5	57.4	18313	9110
	5	42.1	41.1	43.0	18429	11823	48.2	47.3	49.1	20565	12088	53.4	52.4	54.4	18313	9771

8. Myeloma

Myeloma is predominantly a disease of older people, with low incidence before the age of 50 years; the incidence is greater in men at all ages. Over the reported period the age-standardised incidence of disease rose in men and women and age-standardised mortality fell slightly.

The time period covered in this report shows an improvement in relative survival in patients with myeloma. There was an increase in relative survival at 5 years among males (all ages) from 30% (95% CI: 29-31%) for individuals diagnosed in 2000-03 to 43% (95% CI: 41-44%) for those diagnosed in 2008-10. Among female patients (all ages) with myeloma there was an increase in relative survival at 5 years from 28% (95% CI: 27-30%) for individuals diagnosed in 2000-03 to 39% (95% CI: 37-40%) for those diagnosed in 2008-10.

The rising registration rates for myeloma may in part be due to greater ascertainment of cases, particularly in the elderly. There were substantial increases in registration of myeloma in the North West from 2008 onwards (see appendix 2 for more information). The improvements in survival seen in the period reported are likely to be due to the increased use of autologous stem cell transplant in younger (mostly under 70 years) patients, and increasing use of the drugs thalidomide and bortezomib.

Clinical practice was influenced by three clinical trials which showed (in the relatively young patients, mostly aged <70 in whom this potentially toxic treatment could be used) benefit from high dose chemotherapy with autologous stem cell transplant.

Thalidomide was increasingly used after first line chemotherapy had ceased to be beneficial, and Myeloma IX, the UK trial in which half the patients received thalidomide as part of their initial treatment (later shown, by the trial, to be beneficial) started in 2003. More recently lenalidomide has been introduced to clinical practice, with trial evidence of effectiveness, and it is likely that current patient cohorts will experience further improvements in survival.

Trends in incidence and mortality (males)

Figure 8-1. Age-standardised incidence and mortality rates for Myeloma in males in the period 2001-2010 in England (3 year moving average)

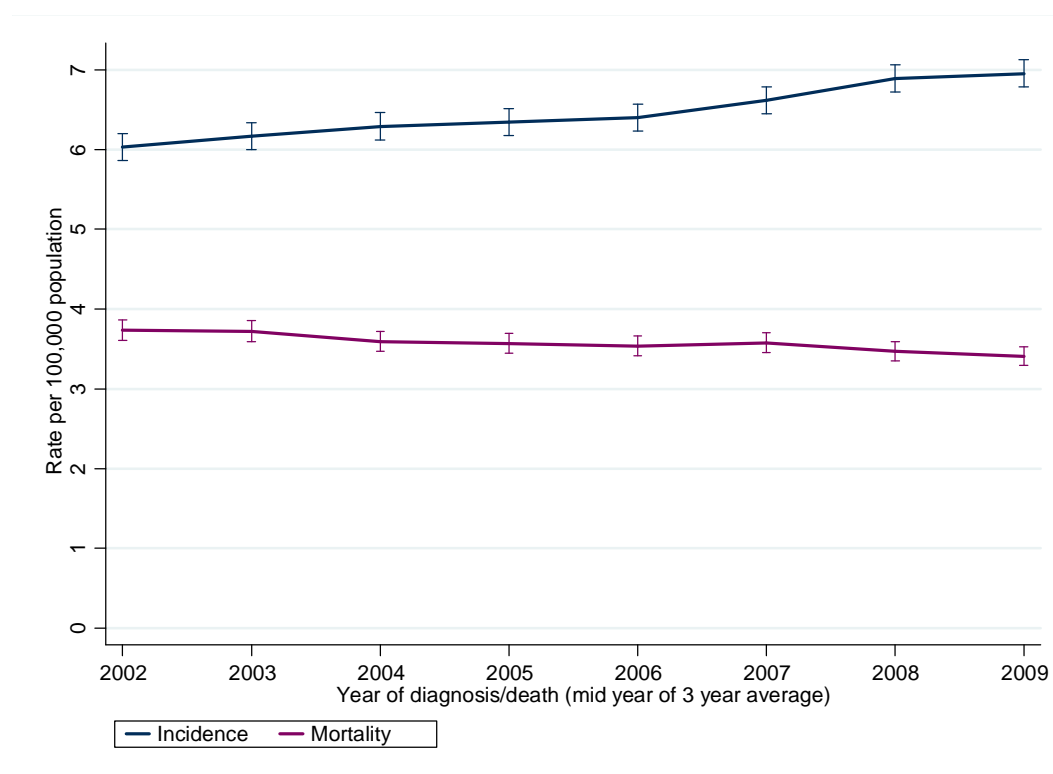


Table 8-1. Age-standardised incidence and mortality rates for Myeloma in males in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	1728	6.0	5.9 6.2	1102	3.7	3.6 3.9
2002-2004	1794	6.2	6.0 6.3	1121	3.7	3.6 3.9
2003-2005	1857	6.3	6.1 6.5	1102	3.6	3.5 3.7
2004-2006	1901	6.3	6.2 6.5	1111	3.6	3.4 3.7
2005-2007	1949	6.4	6.2 6.6	1125	3.5	3.4 3.7
2006-2008	2057	6.6	6.4 6.8	1167	3.6	3.5 3.7
2007-2009	2183	6.9	6.7 7.1	1162	3.5	3.4 3.6
2008-2010	2242	7.0	6.8 7.1	1161	3.4	3.3 3.5

*3 year moving average

Trends in incidence and mortality (females)

Figure 8-2. Age-standardised incidence and mortality rates for Myeloma in females in the period 2001-2010 in England (3 year moving average)

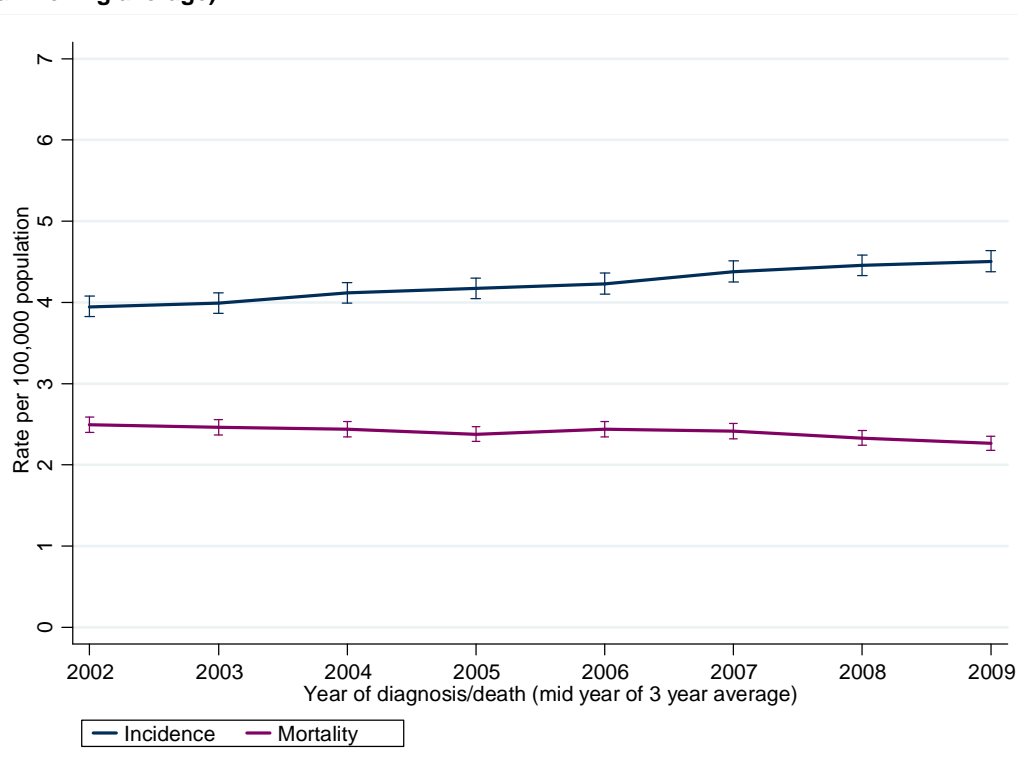


Table 8-2. Age-standardised incidence and mortality rates for Myeloma in females in the period 2001-2010 in England (3 year moving average)

Year	Incidence			Mortality		
	Cases*	ASR	95% CI	Deaths*	ASR	95% CI
2001-2003	1496	3.9	3.8 4.1	1043	2.5	2.4 2.6
2002-2004	1513	4.0	3.9 4.1	1031	2.5	2.4 2.6
2003-2005	1567	4.1	4.0 4.2	1024	2.4	2.3 2.5
2004-2006	1595	4.2	4.0 4.3	1006	2.4	2.3 2.5
2005-2007	1638	4.2	4.1 4.4	1044	2.4	2.4 2.5
2006-2008	1703	4.4	4.3 4.5	1045	2.4	2.3 2.5
2007-2009	1759	4.5	4.3 4.6	1039	2.3	2.2 2.4
2008-2010	1792	4.5	4.4 4.6	1031	2.3	2.2 2.4

*3 year moving average

Trends in survival (males)

Figure 8-3. Trends in relative survival rates for Non-Hodgkin lymphoma in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

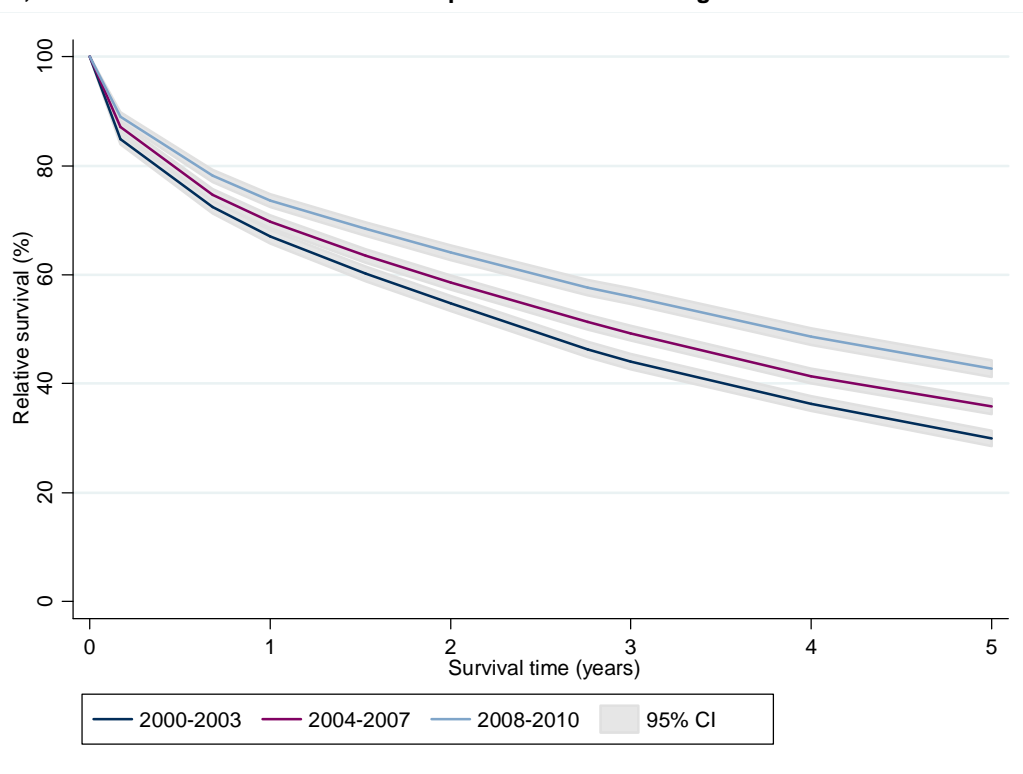


Table 8-3. Trends in relative survival rates for Non-Hodgkin lymphoma in males (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003					2004-2007					2008-2010				
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths
1	67.0	65.8	68.3	6686	2333	69.8	68.6	70.9	7577	2441	73.6	72.4	74.8	6825	1949
2	54.7	53.4	56.1	6686	3201	58.6	57.3	59.9	7577	3331	64.1	62.7	65.4	6825	2659
3	44.1	42.7	45.5	6686	3883	49.2	47.9	50.6	7577	4021	56.1	54.6	57.5	6825	3171
4	36.3	35.0	37.7	6686	4333	41.4	40.0	42.8	7577	4534	48.7	47.1	50.2	6825	3583
5	30.0	28.6	31.3	6686	4662	35.8	34.5	37.2	7577	4866	42.8	41.2	44.3	6825	3875

Trends in survival (females)

Figure 8-4. Trends in relative survival rates for Non-Hodgkin lymphoma in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

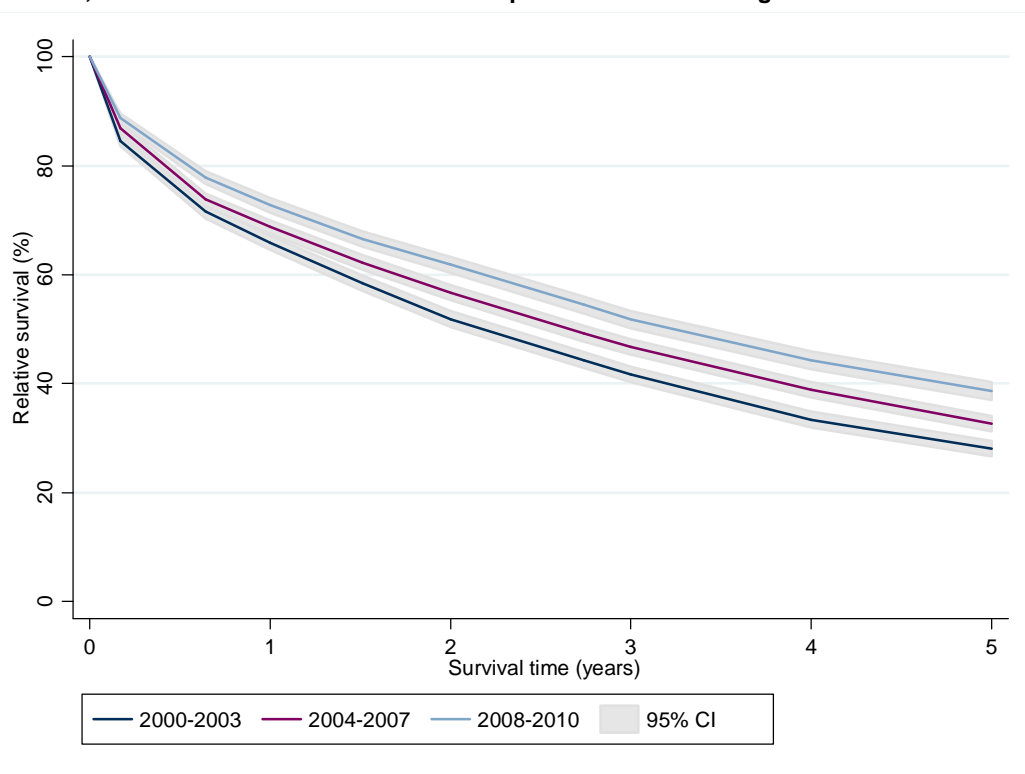


Table 8-4. Trends in relative survival rates for Non-Hodgkin lymphoma in females (all ages) diagnosed in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010 in England

Survival time (years)	2000-2003					2004-2007					2008-2010				
	RS	95 % CI	Cohort	Deaths		RS	95 % CI	Cohort	Deaths		RS	95 % CI	Cohort	Deaths	
1	65.9	64.5	67.2	5921	2115	68.8	67.5	70.0	6263	2071	72.8	71.4	74.1	5417	1576
2	51.9	50.4	53.3	5921	2969	56.7	55.3	58.1	6263	2881	61.9	60.3	63.3	5417	2199
3	41.7	40.3	43.1	5921	3554	46.8	45.3	48.2	6263	3465	51.8	50.2	53.4	5417	2704
4	33.4	32.0	34.8	5921	3990	38.9	37.4	40.3	6263	3896	44.3	42.7	45.9	5417	3042
5	28.1	26.7	29.5	5921	4245	32.7	31.3	34.1	6263	4218	38.6	37.0	40.3	5417	3281

Trends in survival by age (males)

Figure 8-5. Trends in relative survival rates for myeloma diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

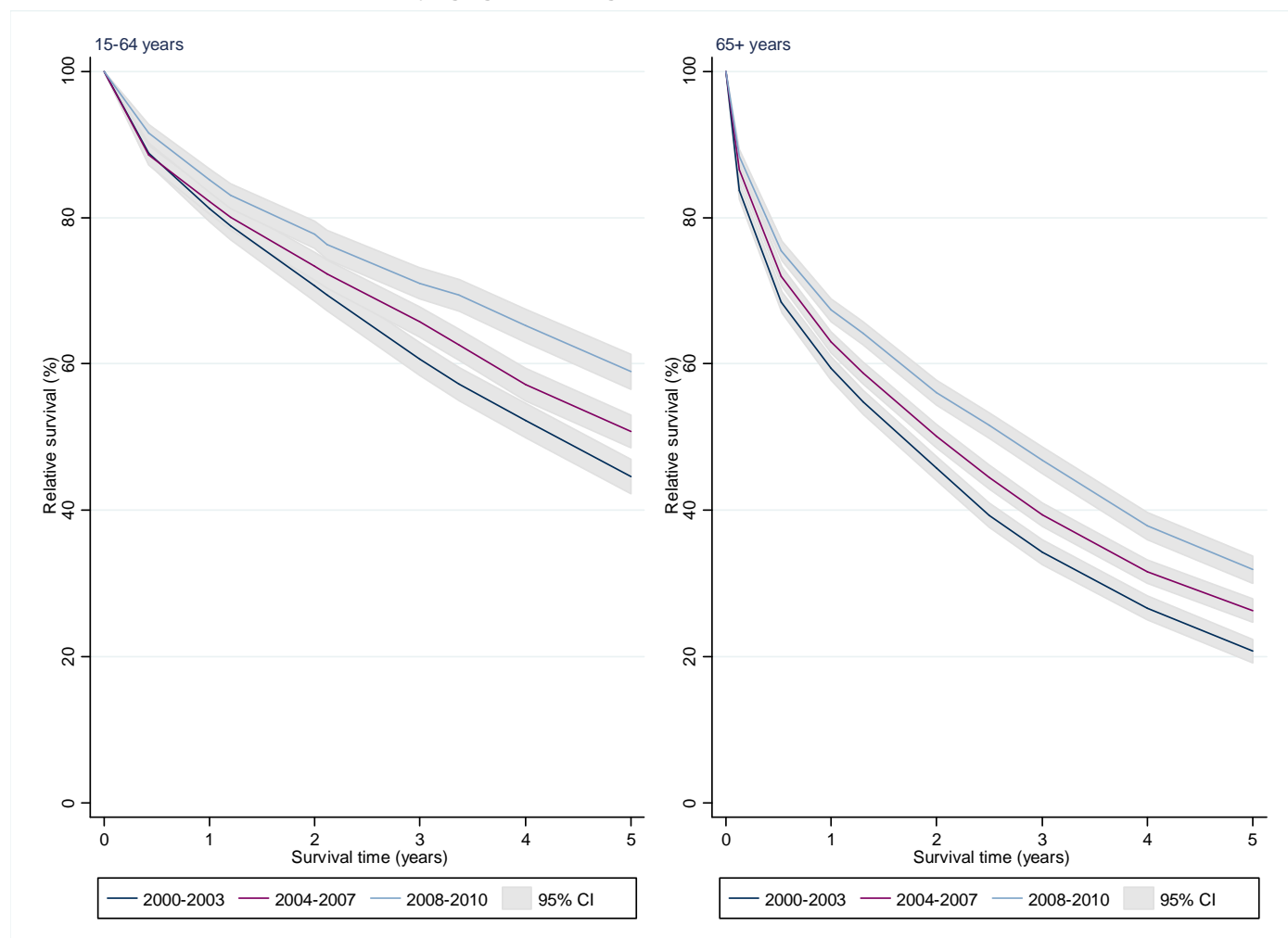


Table 8-5. Trends in relative survival rates for myeloma diagnosed in males in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003						2004-2007					2008-2010				
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	81.3	79.5	83.0	2233	392	82.2	80.5	83.7	2510	420	85.2	83.5	86.7	2261	311
	2	70.7	68.6	72.7	2233	612	73.4	71.5	75.2	2510	624	77.7	75.8	79.6	2261	464
	3	60.7	58.4	62.9	2233	812	65.8	63.6	67.8	2510	794	71.1	68.9	73.1	2261	591
	4	52.3	50.0	54.6	2233	972	57.2	55.0	59.4	2510	972	65.2	62.9	67.5	2261	695
	5	44.6	42.2	46.9	2233	1109	50.8	48.5	53.1	2510	1100	59.0	56.5	61.3	2261	798
65+ years	1	59.4	57.8	61.0	4541	1941	63.0	61.5	64.4	5126	2021	67.4	65.8	68.9	4660	1638
	2	45.8	44.1	47.4	4541	2589	50.2	48.6	51.7	5126	2707	56.2	54.4	57.8	4660	2195
	3	34.3	32.6	36.0	4541	3071	39.4	37.8	41.0	5126	3227	46.8	45.0	48.6	4660	2580
	4	26.7	25.0	28.3	4541	3361	31.6	30.0	33.2	5126	3562	37.9	36.0	39.7	4660	2888
	5	20.8	19.2	22.4	4541	3553	26.3	24.7	27.9	5126	3766	31.9	30.0	33.8	4660	3077

Trends in survival by age (females)

Figure 8-6. Trends in relative survival rates for myeloma diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

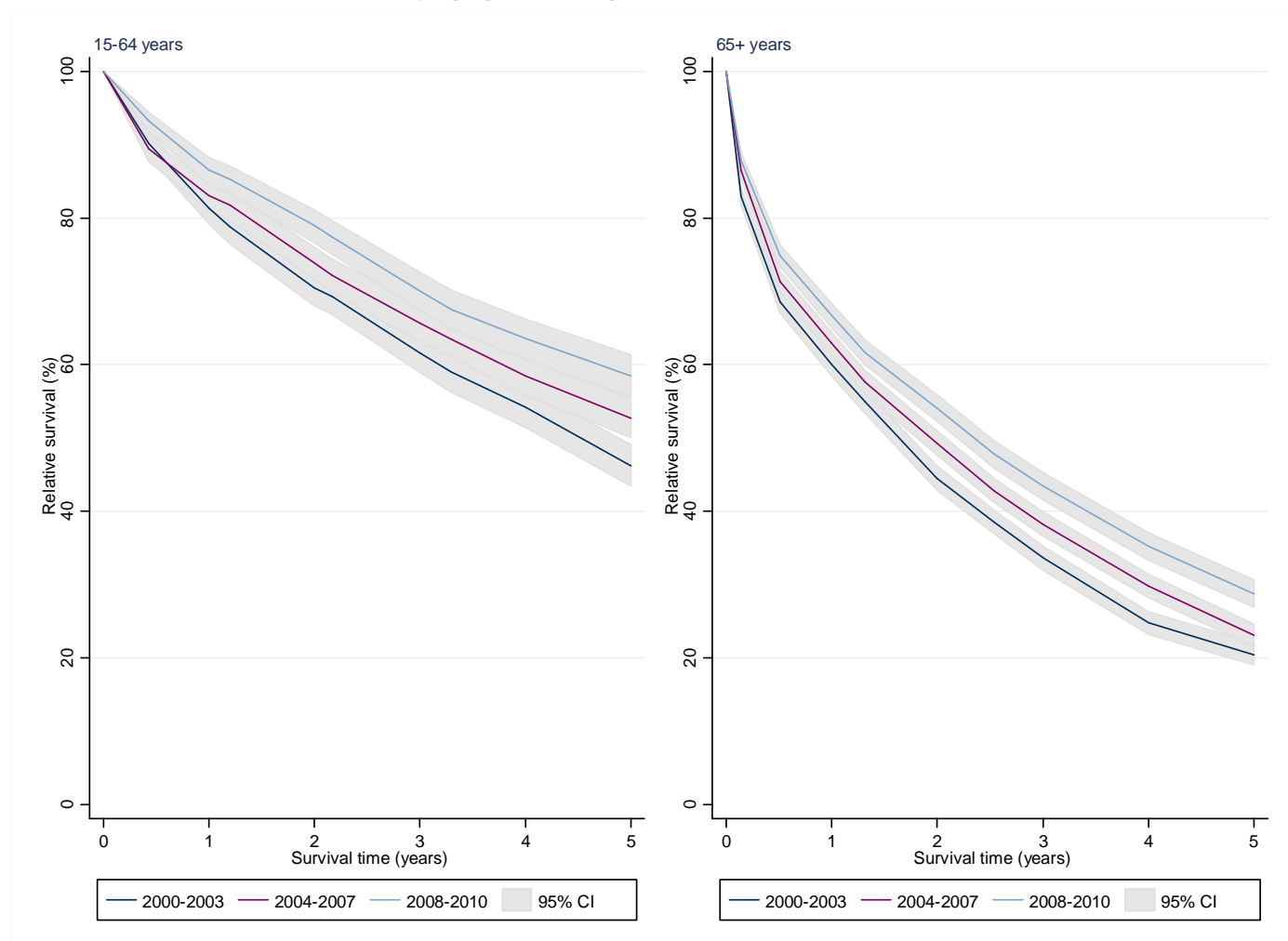


Table 8-6. Trends in relative survival rates for myeloma diagnosed in females in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Deaths		
15 - 64 years	1	81.4	79.2	83.3	1595	273	83.0	81.1	84.8	1749	274	86.5	84.6	88.3	1557	190
	2	70.5	68.0	72.9	1595	426	73.9	71.6	76.1	1749	423	79.0	76.6	81.1	1557	294
	3	61.6	58.9	64.2	1595	550	65.7	63.2	68.0	1749	550	70.1	67.4	72.6	1557	406
	4	54.2	51.4	56.9	1595	647	58.4	55.8	60.9	1749	657	63.5	60.7	66.2	1557	484
	5	46.2	43.4	49.0	1595	740	52.7	50.0	55.3	1749	737	58.5	55.6	61.3	1557	543
65+ years	1	60.0	58.4	61.6	4368	1841	62.9	61.4	64.4	4597	1797	66.7	65.1	68.3	3922	1386
	2	44.5	42.9	46.2	4368	2542	49.3	47.7	50.9	4597	2458	54.1	52.3	55.9	3922	1905
	3	33.6	32.0	35.2	4368	3003	38.3	36.6	39.9	4597	2915	43.4	41.5	45.2	3922	2298
	4	24.8	23.3	26.3	4368	3342	29.8	28.2	31.4	4597	3239	35.2	33.3	37.1	3922	2558
	5	20.5	19.0	22.0	4368	3504	23.1	21.5	24.6	4597	3481	28.8	26.9	30.6	3922	2738

Trends in survival by age (persons)

Figure 8-7. Trends in relative survival rates for myeloma diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

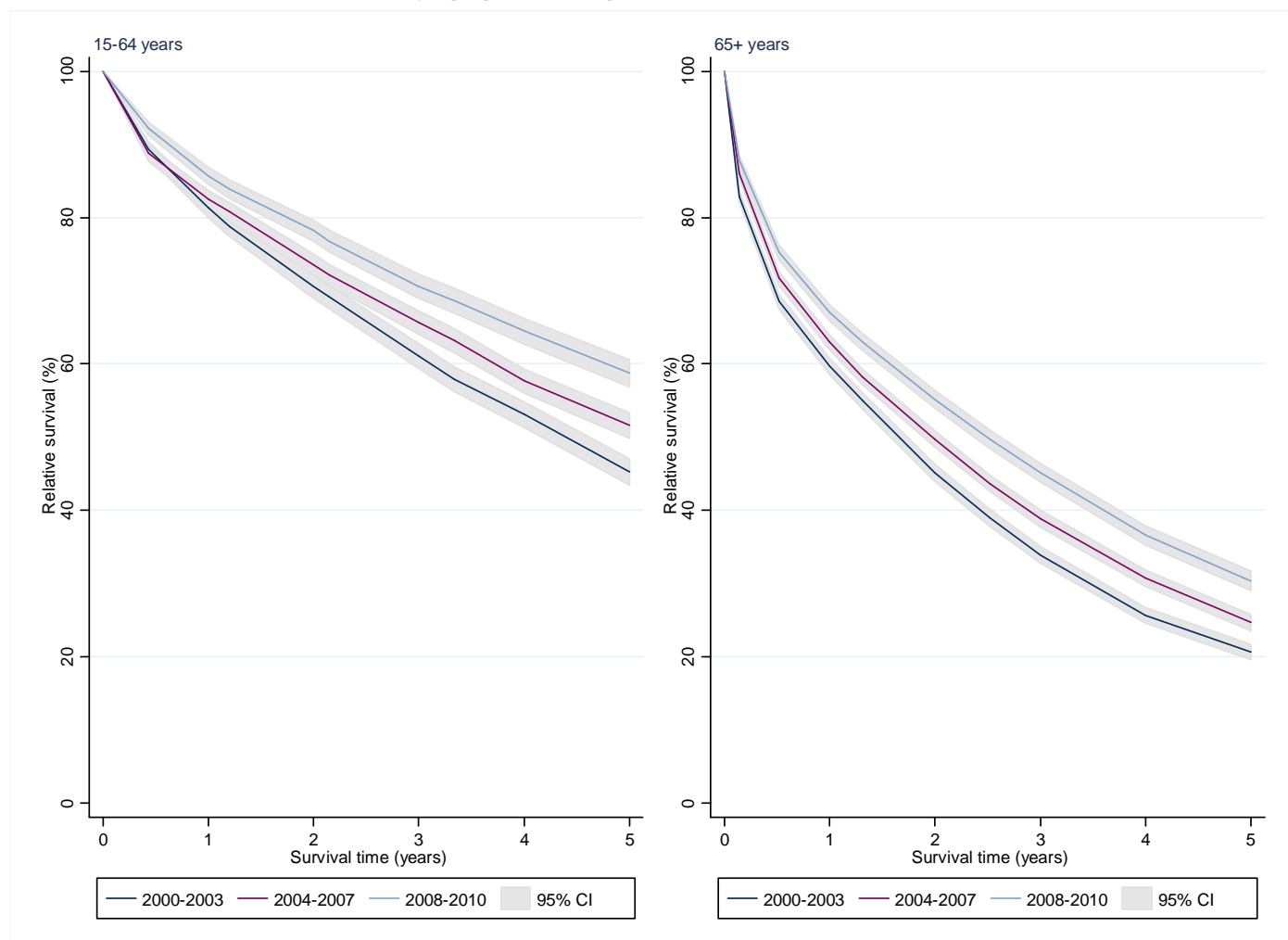


Table 8-7. Trends in relative survival rates for myeloma diagnosed in persons in the periods 2000-2003, 2004-2007 and 2008-2010 followed up to end of 2010, by age group in England

Survival (years)	2000-2003					2004-2007					2008-2010					
	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	RS	95% CI		Cohort	Deaths	
15 - 64 years	1	81.3	79.9	82.6	3830	665	82.5	81.3	83.7	4266	694	85.7	84.5	86.9	3820	501
	2	70.6	69.0	72.2	3830	1038	73.6	72.1	75.0	4266	1047	78.2	76.7	79.6	3820	758
	3	61.1	59.4	62.8	3830	1362	65.7	64.1	67.2	4266	1344	70.6	69.0	72.2	3820	997
	4	53.1	51.3	54.9	3830	1619	57.7	56.0	59.3	4266	1629	64.5	62.7	66.2	3820	1179
	5	45.3	43.5	47.1	3830	1849	51.6	49.9	53.3	4266	1837	58.8	56.9	60.6	3820	1341
65+ years	1	59.7	58.6	60.8	8915	3782	63.0	61.9	64.0	9740	3818	67.1	65.9	68.2	8593	3024
	2	45.1	43.9	46.3	8915	5131	49.8	48.6	50.9	9740	5165	55.2	53.9	56.4	8593	4100
	3	33.9	32.8	35.1	8915	6074	38.9	37.7	40.0	9740	6142	45.2	43.9	46.5	8593	4878
	4	25.7	24.5	26.8	8915	6703	30.7	29.6	31.9	9740	6801	36.6	35.3	37.9	8593	5446
	5	20.6	19.6	21.7	8915	7057	24.7	23.6	25.8	9740	7247	30.4	29.1	31.7	8593	5815

Appendix 1: Statistical methods

Age-standardised rate (ASR)

The direct method of age standardisation was used to produce the theoretical rate that would occur if the observed age specific incidence/mortality rates applied in a standard population. In this report the European Standard Population was used. The European Standardised Rate (ESR) was calculated using the formula:

$$ESR = \frac{\sum_{i=1}^A a_i w_i}{\sum_{i=1}^A w_i}$$

Where

A = the number of age intervals
 a_i = the incidence/mortality rate per 100,000 in age group i
 w_i = the European Standard Population in age group i

Survival

In a cohort of cancer patients, overall (observed) mortality can be divided into two components: the background mortality, also known as the expected mortality representing all-cause deaths in the general population, and the excess mortality due to cancer. Background mortality is calculated from life tables for England.

excess mortality = observed mortality – expected mortality

$$\lambda_c(t) = \lambda(t) - \lambda_e(x+t, z) = \sum_{k=1}^m \alpha_k I_k(t)$$

where α_k = the excess mortality hazard in the k th interval and $I_k(t) = \begin{cases} 1 & \text{kth interval} \\ 0 & \text{otherwise} \end{cases}$

Relative survival reflects the excess mortality among cancer patients, over and above the background mortality in the country or region where they live. It is the ratio of the observed survival rate and the expected survival rate of the general population with a similar age/sex structure to the cancer patients in the study.

The analyses undertaken in this report use relative survival estimated using the maximum likelihood method for individual records, developed by Estève *et al* (1) using the *strel* command in Stata version 11. This method assumes that the hazard is constant within each interval. The cumulative relative survival at time t using the ML method is given by:

$$S_t = \exp\left(-\sum_{k=1}^{i-1} \alpha_k (t_k - t_{k-1}) + (t - t_{i-1})\right)$$

Long term estimates of survival can be out of date and to enable a more relevant recent analysis we have utilised the period approach as defined by Brenner and Gefeller (2). This limits the analysis to a recent time window (the 'period' of interest) and allows inclusion of individuals whose survival spans the period or commences during the period. All cases were followed up for at least five years (unless otherwise stated) or until death. Registrations with zero survival were excluded from the analysis. The age at diagnosis for cases ranged between

0 and 108 years. Age-stratified relative survival analyses for disease groups chronic lymphocytic leukaemia, chronic myeloid leukaemia and myeloma excluded those persons aged less than 15 years at diagnosis.

To enable smooth curves, the intervals adopted in the survival analysis are closer than those used to produce the tables; hence the annual survival point estimates may vary between the graphs and tables. This is most pronounced for age- & sex-stratified analyses of CML and Hodgkin lymphoma.

Confidence intervals

The estimated rates presented (for incidence, mortality and survival) have 95% confidence intervals attached. There is a 95% chance that the true value of the estimated rate will lie within the interval given. The width of the interval is influenced by the number of cases used to estimate the rate. The more cases in the group, the more precise will be the estimate of the rate and the narrower the confidence interval. When comparing two different estimated rates, if their respective confidence intervals overlap, then the true value of both rates could be the same. The apparent difference in the estimates is due to chance. If the two confidence intervals do not overlap, there is evidence to suggest that the difference in the true values of the rates is real. If the difference in two rates could be due to chance (intervals overlap), it is described as not significant. If the intervals suggest that the true rates are different (intervals do not overlap) the difference is described as significant.

Appendix 2: Disease Groups and data quality

ICD10 codes used to group haematological malignancies

The codes used to categorise specific disease groups are shown in the table below.

Table 9-1. Classification of haematological malignancies used in this report

Disease Group	ICD10 code
Acute Lymphoblastic Leukaemia	C91.0
Acute Myeloid Leukaemia	C92.0, C92.4, C92.5, C93.0, C94.0, C94.2
Chronic Lymphoid Leukaemia	C91.1
Chronic Myeloid Leukaemia	C92.1
Hodgkin Lymphoma	C81
Non-Hodgkin Lymphoma	C82, C83, C84, C85
Myeloma	C90
Other	C91.2, C91.3, C91.4, C91.5, C91.7, C91.9, C92.2, C92.3, C92.7, C92.9, C93.1, C93.2, C93.7, C93.9, C94.3, C94.4, C94.5, C94.7, C95.0, C95.1, C95.2, C95.7, C95.9, C96.0, C96.1, C96.2, C96.3, C96.7*, C96.9

Trends in ascertainment of haematological malignancies

In the previous report published in 2013 on trends in haematological malignancies diagnosed in 2001-2008 (4), an issue was noted where registries recording morphology in ICD-O-2 mapped conditions to the ICD10 disease codes D45-47, but for registries using ICD-O-3 the malignant nature of these conditions has been reflected in mapping them to code C96.7. This led to the overall number of haematological malignancies to increase. For this report this issue has been resolved by the dataset used having mapped all ICD-O-3 disease codes back to ICD-O-2 for consistency, so this is no longer an issue. This also means that the definition of 'all cancers' will be slightly different between the two reports, as the D45-47 codes mapped to C96.7 will have been included in the previous report, but will be excluded from these data due to the recoding process.

However, data quality remains an issue when interpreting trends in haematological cancers. As reported in our 2010 'Blood Cancers Data Quality Report' (3) "The completeness of ascertainment of blood cancers by English cancer registries has varied over the period 2000-2010." There have been substantial changes in the numbers of some forms of cancer recorded by, what were at that time, regional cancer registries. The most marked change in the overall registrations for blood cancers was seen in the former North West Cancer Intelligence Service (NWCIS) from 2008 onwards. This has been attributed by NWCIS to access to information from Multidisciplinary team (MDT) data systems at this time, which provided notifications of some blood cancer disease groups which had previously been less completely ascertained through

pathology systems. This particularly affected registration of CLL and myeloma, whilst registration rates for lymphomas were largely unchanged.

The impact of these changes are most apparent in figures 1-1, 1-2 and tables 1-1, 1-2 for all haematological malignancies as these show data for individual years; the tables and trend charts for individual disease groups use three year moving averages which has the effect of 'smoothing' the trend lines.

References

- (1) Esteve J, Benhamou E, Croasdale M, Raymond L. 'Relative survival and the estimation of net survival: elements for further discussion', *Stat Med*, 9, 529-538 (1990).
- (2) Brenner H, Gefeller O. 'An alternative approach to monitoring cancer patient survival', *Cancer*, 78, 2004-2010 (1996).
- (3) NYKIT & NCRS, Blood Cancers Data Quality Report National Cancer Data Repository (NCDR) -2010. (<http://www.ncin.org.uk/view?rid=2382>)
- (4) NCIN, Haematological malignancies in England Cancers Diagnosed 2001-2008 (<http://www.ncin.org.uk/view?rid=1787>)

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