Public Health England

Protecting and improving the nation's health

National Cancer Intelligence Network

Factors influencing survival from melanoma in England, Northern Ireland and Scotland

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.

Public Health England
Wellington House
133-155 Waterloo Road
London SE1 8UG
Tel: 020 7654 8000
www.gov.uk/phe
Twitter: @PHE_uk
Facebook: www.facebook.com/PublicHealthEngland

Authors: Tim Jones, Alex Ives, Veronique Poirier, Julia Newton-Bishop, Julia Verne
For queries relating to this document, please contact: (Veronique.poirier@phe.gov.uk)

Published October 2015
PHE publications gateway number: 2015409

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 standards of cancer care 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 Network provides information and intelligence to improve decision-making for high-quality, cost-effective services. Its work supports policy makers, commissioners, managers, regulators, and other health stakeholders working on children's, young people's and maternal health.

National Mental Health, Dementia and Neurology Intelligence Network

The National Mental Health Intelligence Networks (NMHDNIN) brings together the distinct National Mental Health Intelligence Network, the Dementia Intelligence Network and the Neurology Intelligence Network under a single programme. The Networks work in partnership with key stakeholder organisations. The Networks seeks to put information and intelligence into the hands of decision makers to improve mental health and wellbeing, support the reduction of risk and improve the lives of people living with dementia and improve neurology services.

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.

Contents

About Public Health England 2
The intelligence networks 2
Contents 4
Executive summary 5
1. Introduction 7
2. Method 8
3. Results 12
4. Conclusion 25
5. References 26

Executive summary

Melanoma is amongst the top ten most common cancers in the UK, and is associated with higher mortality than other skin cancers. In 2010, around 12,800 people in the UK were diagnosed with melanoma, and around 2,200 people died from it (United Kingdom Cancer Information Service (UKCIS*)).

Given the large numbers of people diagnosed with melanomas, it is important to understand what influences someone's chances of survival once they have been diagnosed. This can help us to focus on interventions or targeted campaigns that are likely to maximise improvements in survival. This report explores the impact of various factors (sex, age, tumour thickness, anatomical location, morphology, ethnicity, and income deprivation) on the chances of surviving for five years after being diagnosed with melanoma in England, Northern Ireland, and Scotland.

Information about the cohort of patients to be used in the survival analysis (Table 1) was extracted from the Celtic National Cancer Data Repository 2010 (Celtic NCDR 2010), and includes those patients with a first primary diagnosis of melanoma (ICD-10 Code: C43) in England, Northern Ireland, and Scotland, in the years 2002 to 2010.

Relative five-year survival was used for the analysis and estimated separately within each country for sub-groups of the overall cohort, categorised according to the factors of interest: sex, age, tumour thickness, anatomical location, morphology. Some data limitations were experienced due to differences in registering and reporting the data between England, Northern Ireland and Scotland. Although requested to take part, Wales felt that their data was not suited for such a project.

The main results were as follows:

- men had significantly poorer five-year relative survival than women in all three countries and overall those aged 60+ in England and Scotland had a significantly worse five-year survival than those aged below 60. This was not the case in Northern Ireland
- the thickest tumours were more common among older males, and had a greater tendency to be on the head and neck, of nodular morphology and overall the five-year survival was poorer
- Northern Ireland had the worst five-year survival for tumours thicker than 4mm, although not significantly lower that Scotland
- across all three countries five-year survival was poorer for head and neck, and trunk tumours, compared to those on the limbs – patients with a tumour of unspecified anatomical site had significantly better survival in Northern Ireland; it seems that the recording of this category may differ across the countries

- nodular melanomas were associated with a poorer prognosis compared to lentigo and superficial spreading melanomas across the three countries
- five-year survival was poorer in more deprived areas in England, even when controlling for the effect of deprivation on mortality in the background population; data for Northern Ireland and Scotland was not available

The impact of various factors on the five-year relative survival from melanoma was broadly the same between countries, making the findings robust, although a lack of power (particularly due to smaller cohorts in Scotland and Northern Ireland) sometimes prevented effects from being detected.

*notes: United Kingdom Cancer Information Service has now been replaced by the NHS CancerStats portal

1. Introduction

Malignant melanoma is a skin cancer involving the melanocytes, cells that form a pigment in the skin protecting us from ultra-violet (UV) radiation. Melanoma is among the top ten most common cancers in the UK, and is associated with higher mortality than other skin cancers. In 2010, around 12,800 people in the UK were diagnosed with melanoma, and around 2,200 people died from it (UK CIS).

The incidence of melanoma in the UK has been increasing steadily and has roughly doubled over the last 20 years (UK CIS). Despite advice to use sun cream and avoid over-exposure to the sun by covering up with clothes or finding shade[1], this increasing trend looks set to continue for some time into the future, before the change in behaviours has an impact[2] .Epidemiological studies have shown very strong evidence that melanoma is associated with vocational/recreational sun exposure and sunburn at a young age[1]. Exposure to ultra-violet (UV) radiation due to sunbed useage is a common and potentially avoidable source of UV radiation, and has been classed as a carcinogen[3] by the International Agency for Research on Cancer.

Data from the Office of National Statistics shows that UK residents have taken an increasing number of, sunny holidays in recent years[4]. In 1980 14.6 million Britons took holidays elsewhere in Europe and in 2010, 42.6 million did so. It seems likely, therefore, that the increasing incidence reflects this increased mobility of the UK population.

Given the large numbers of people diagnosed with melanomas, it is important to understand what influences someone's chances of survival once they have been diagnosed. This can help us to focus on interventions or targeted campaigns that are likely to maximise improvements in survival. This report explores the impact of various factors (sex, age, tumour thickness, anatomical location, morphology, ethnicity, and income deprivation) on the chances of surviving for five years after being diagnosed with melanoma in England, Northern Ireland, and Scotland.

2. Method

Information about the cohort of patients to be used in the survival analysis (Table 1) was extracted from the Celtic National Cancer Data Repository 2010 (Celtic NCDR 2010), and includes patients with a first primary diagnosis of melanoma (ICD-10 Code: C43) in England, Northern Ireland, and Scotland, in the years 2002 to 2010. Residents of Wales were not included in this report as the Welsh Cancer Intelligence and Surveillance Unit did not feel that their data was suitable for inclusion in this report.

Relative five-year survival was estimated separately within each country for sub-groups of the overall cohort, categorised according to the factors of interest: sex, age, tumour thickness, anatomical location, morphology, ethnicity, and income deprivation. Information on ethnicity and income deprivation was only readily available for patients resident in England, so the impact of these factors on survival is only investigated for England.

Relative survival is the standard method of estimating population-based survival[5]. It provides a ratio of the observed survival in the cohort of cancer patients compared to the 'background' survival that would be expected in the general population for people with the same characteristics as the patients (ie, sex, age, year, country, and region). To estimate the expected survival, the cohort of patients is matched to a population-based lifetable, which gives the mortality risk over the whole population for people with different characteristics. For the analysis of the impact of income deprivation on survival from melanoma (and only for this analysis), the England data was matched to a lifetable including deprivation quintiles, as we know deprivation influences mortality in the population more generally[5]. This technique allows us to estimate survival statistics without the need for precise cause of death information, which is often poorly recorded[6]. The relative survival statistic can be interpreted as the survival from cancer after adjusting for background mortality due to other causes[5].

The current report uses the 'period' approach to relative survival. This produces more up-to-date estimates of survival than the traditional 'cohort' approach[7], and allows us to use the more complete data for recent years in the survival estimation (for example, Scotland only provides tumour thickness information from 2005 onwards). All survival calculations were carried out using the strel module (London School of Hygiene & Tropical Medicine) in STATA statistical software (Stata Corporation, College Station, Texas).

On all graphs, error bars represent 95% confidence intervals. Comparison of relative survival between groups was carried out using z-tests. As the confidence intervals around the relative survival statistic provided by strel were generally asymmetric, the

standard error of the survival rate was estimated using the larger of the confidence intervals (by dividing it by 1.96), to be conservative in tests of significance.

Data Limitations

To maintain the anonymity of patients, the Celtic NCDR 2010 does not include any dates of birth for Northern Ireland, and there is no information for day of the month for births or diagnoses in any country. For this reason, and for consistency between the analyses for all countries, each patient is assumed to have been diagnosed exactly on their birthday (ie, their age at diagnosis in years is considered to be exactly that number of years since their birth).

Death Certificate Only (DCO) cases were excluded (n = 208; < 0.3% of patients in each country).

Patients without recorded DCO information (n = 414; all in England [0.6% of patients in England]) were also excluded to avoid ambiguity.

Scotland only provides information on Breslow thickness from 2005 onwards, and Breslow thickness information is more complete for all countries in more recent years.

In each section of the results, a table is provided summarising differences in the cohort split by the factor of interest. This information does not allow us to deduce causal explanations for any differences due to a factor, but does flag potential contributing factors.

Table 1. Descriptive statistics on the cohort of patients used in the survival analysis: diagnosed with melanoma in 2002 to 2010

Factor	Levels	England		Northern Ireland		Scotland	
		Count	%	Count	%	Count	%
Sex	Males	31,731	46	813	41	3,462	43
	Females	37,837	54	1,171	59	4,510	57
Age Group	Below 60	34,817	50	1,097	55	4,096	51
	60+	34,751	50	887	45	3,876	49
Breslow Thickness	< 1 mm	25,457	37	997	50	2,808	35
	1 - 2 mm	14,889	21	389	20	1,271	16
	2.01 - 4 mm	6,953	10	256	13	668	8
	> 4 mm	7,371	11	163	8	576	7
	Unknown	14,898	21	179	9	2,649*	33*
Anatomical Location	Head and Neck	11,157	16	401	20	1,731	22
	Lower Limb (inc. hip)	19,897	29	573	29	2,266	28
	Trunk	20,803	30	419	21	2,116	27
	Upper Limb (inc. shoulder)	14,495	21	429	22	1,624	20
	Unspecified	3,107	4	162	8	233	2
Morphology	Lentigo	3,291	5	207	10	926	12
	Nodular	8,395	12	377	19	751	9
	Superficial Spreading	31,324	45	1,012	51	4,220	53
	Other	2,449	4	86	4	721	9
	Unknown	24,109	35	302	15	1,354	17
Ethnicity	Black	66	0.1				
	Chinese	20	0.0				
	Indian/Pakistani/Bangladeshi	42	0.1				
	White	41,316	58.6				
	Not known	20,310	30.0				
	Not stated	7,567	10.9				
	Other	247	0.4				
Income Deprivation Quintile	1 - least deprived	18,493	27				
	2	17,427	25				
	3	15,178	22				
	4	11,292	16				
	5 - most deprived	7,178	10				

Source: Celtic NCDR 2010

1-Note: ‘overlapping’ anatomical location has not been included due to small numbers; percentages are rounded to the nearest whole number, except ethnicity which includes one decimal place.

* The Scottish Cancer Registry has only collected Breslow thickness for patients diagnosed from 2005 onwards, so the period 2002 to 2004 contributes heavily to the ‘unknown’ group. Equivalent data for Scotland for the period of diagnosis 2005 to 2010 are as follows:

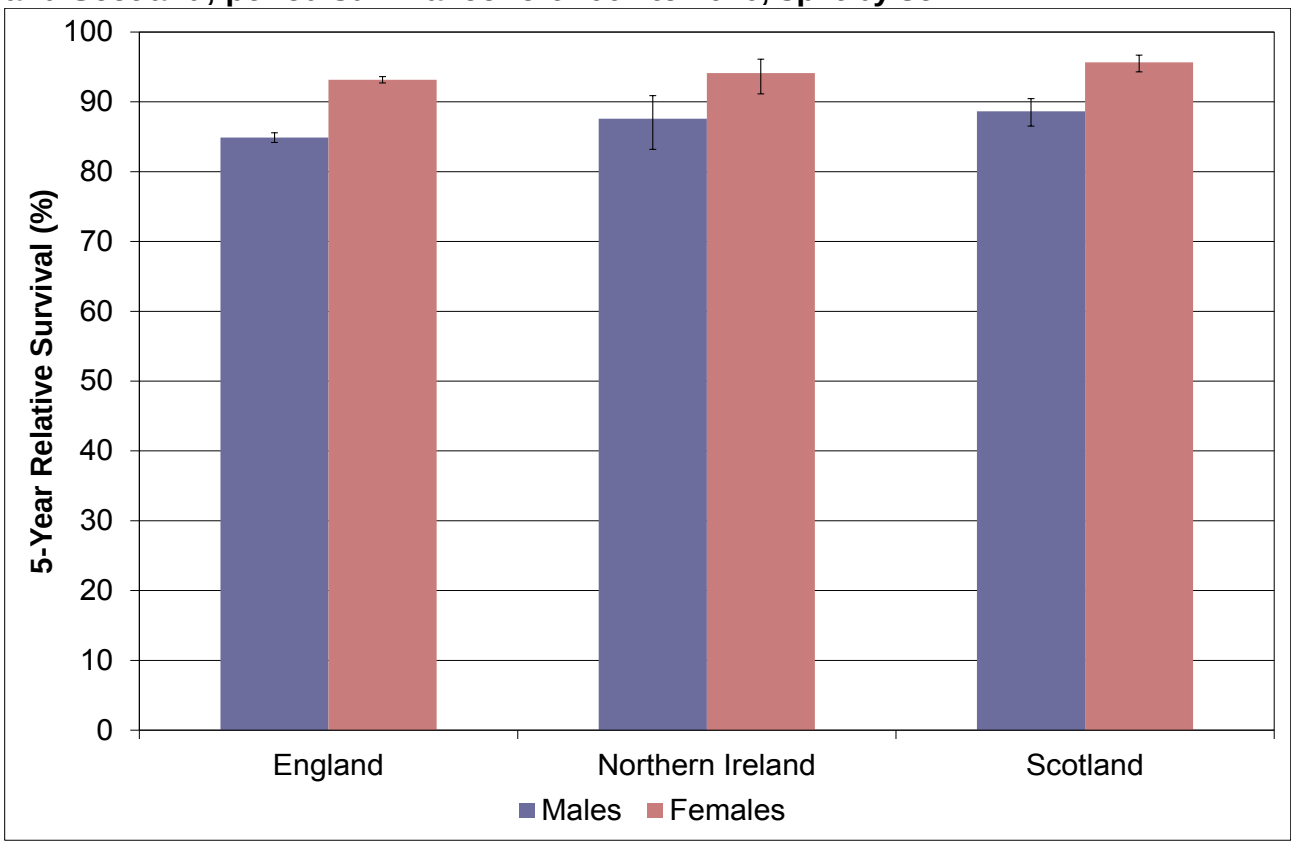
		Count	%
Breslow Thickness	< 1 mm	2,808	50
	1 - 2 mm	1,271	22
	2.01 - 4 mm	668	12
	> 4 mm	576	10
	Unknown	326	6

3. Results

Sex

- men had significantly poorer five-year relative survival than women in all three countries (Figure 1 and Table 2)
- men presented at a slightly older age than women, with thicker tumours on average – melanomas in men had a greater tendency to be on the head, neck, and trunk than for women, and were more likely to be of nodular morphology (Tables 3 and 4)

Figure 1. Five-year relative survival from melanoma in England, Northern Ireland, and Scotland; period survival cohort 2002 to 2010, split by sex



Source: Celtic NCDR 2010

Table 2. Results of z-tests (df = 1 in each case) exploring the difference in relative survival by sex in each country

Country	z	P
England	19.1	< .001
Northern Ireland	2.4	0.015
Scotland	5.4	< .001

Table 3. Characteristics of sex within the cohort, in terms of age, Breslow thickness, anatomical location, and morphology of tumour at diagnosis

Factor		England		Northern Ireland		Scotland	
		Males	Females	Males	Females	Males	Females
Age	Average	59.7	57.2	57.2	54.6	60.4	55.9
	95% CI	59.6 - 59.9	57.1 - 57.4	56.1 - 58.5	53.6 - 55.8	59.9 - 61	55.4 - 56.5
Breslow Thickness	Average	2.4	2.0	1.9	1.6	2.1	1.7
	95% CI	2.4 - 2.5	2 - 2.1	1.7 - 2.1	1.4 - 1.7	2 - 2.2	1.6 - 1.8
Anatomical Location (%)	Head and Neck	20	12	27	14	28	18
	Lower Limb & Hip	14	40	15	39	12	40
	Trunk	43	21	32	13	40	18
	Unspecified	4	4	7	8	3	2
	Upper Limb & Shoulder	19	23	19	25	17	23
Morphology (%)	Lentigo	5	4	12	10	12	11
	Nodular	14	11	20	18	11	8
	Superficial Spreading	43	47	48	53	50	55
	Other	4	3	5	4	10	9
	Unknown	35	35	15	15	17	17

Source: Celtic NCDR 2010

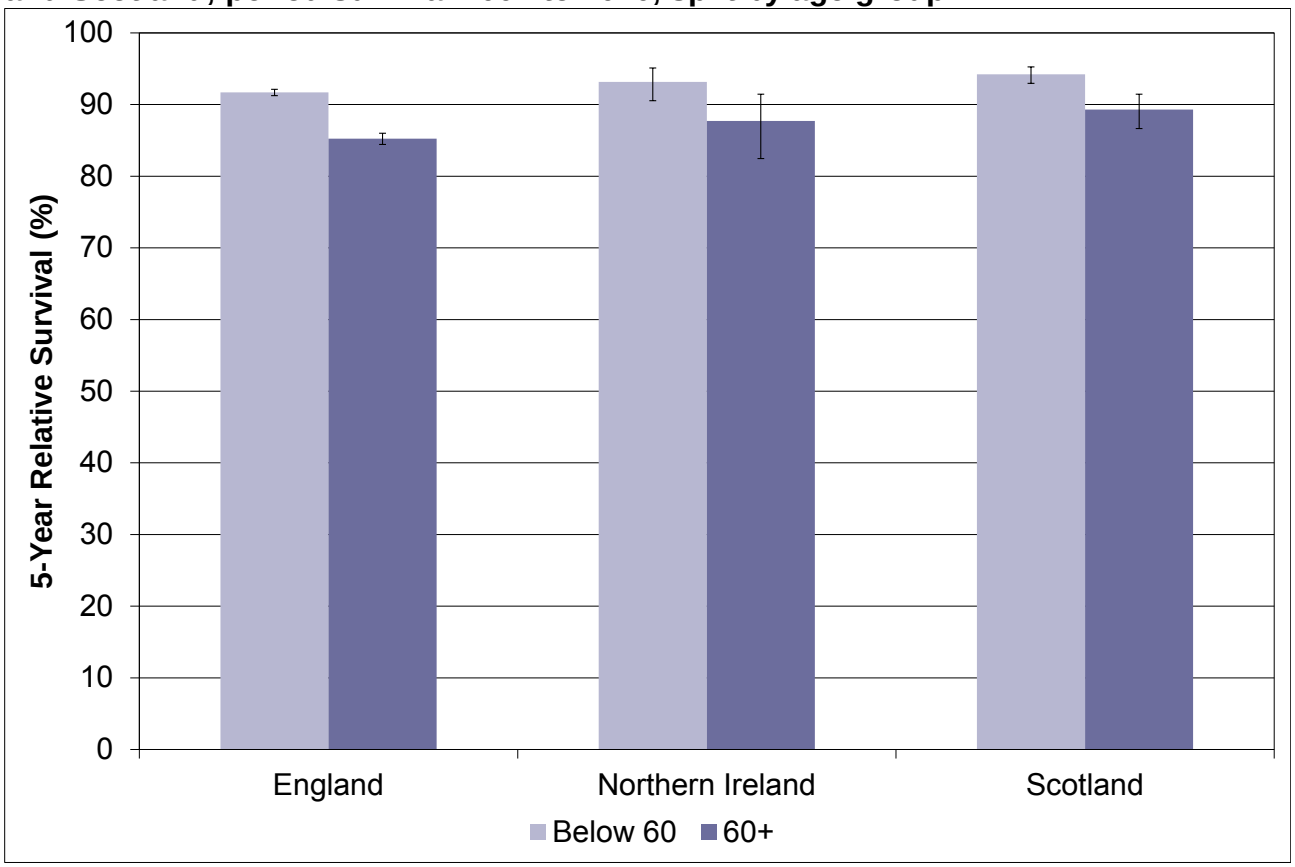
Table 4. Results of chi-square tests (df = 4 in all cases) exploring whether the distribution of melanomas by anatomical location and morphology vary with sex

Factor	England		Northern Ireland		Scotland	
	X^2	P	X^2	p	X^2	p
Anatomical Location	7776	< .001	217	< .001	942	< .001
Morphology	194	< .001	5.86	0.21	31	< .001

Age Group

- relative survival was worse in the older age group (60+ years) compared to the younger age group (below 60 years); (Figure 2 and Table 5)
- the older age group contained a slightly greater proportion of men than the younger group, presented with thicker tumours, had a greater tendency for melanomas on the head and neck, and were more often diagnosed with lentigo and nodular melanomas (Tables 6 and 7)

Figure 2. Five-year relative survival from melanoma in England, Northern Ireland, and Scotland; period survival 2002 to 2010, split by age group



Source: Celtic NCDR 2010

Table 5. Results of z-tests (df = 1 in each case) exploring the difference in relative survival by age group in each country

Country	z	p
England	13.7	< .001
Northern Ireland	1.8	0.067
Scotland	3.3	< .001

Table 6. Characteristics of age groups within the cohort, in terms of sex (%), Breslow thickness, anatomical location (%), and morphology of tumour at diagnosis (%)

Factor		England		Northern Ireland		Scotland	
		Below 60	60+	Below 60	60+	Below 60	60+
Sex (%)	Male	42	50	38	45	38	49
	Female	58	50	62	55	62	51
Breslow Thickness	Average	1.6	2.8	1.3	2.3	1.3	2.4
	95% CI	1.5 - 1.6	2.7 - 2.9	1.2 - 1.4	2.1 - 2.5	1.2 - 1.4	2.3 - 2.6
Anatomical Location (%)	Head and Neck	9	23	12	31	11	33
	Lower Limb & Hip	30	27	30	27	32	24
	Trunk	35	25	26	15	31	22
	Upper Limb & Shoulder	21	20	22	21	22	19
	Unspecified	4	5	9	7	3	3
Morphology (%)	Lentigo	1	8	3	20	4	20
	Nodular	8	16	17	22	6	13
	Superficial Spreading	53	37	63	36	65	40
	Other	3	4	2	7	8	10
	Unknown	35	35	15	15	17	17

Source: Celtic NCDR 2010

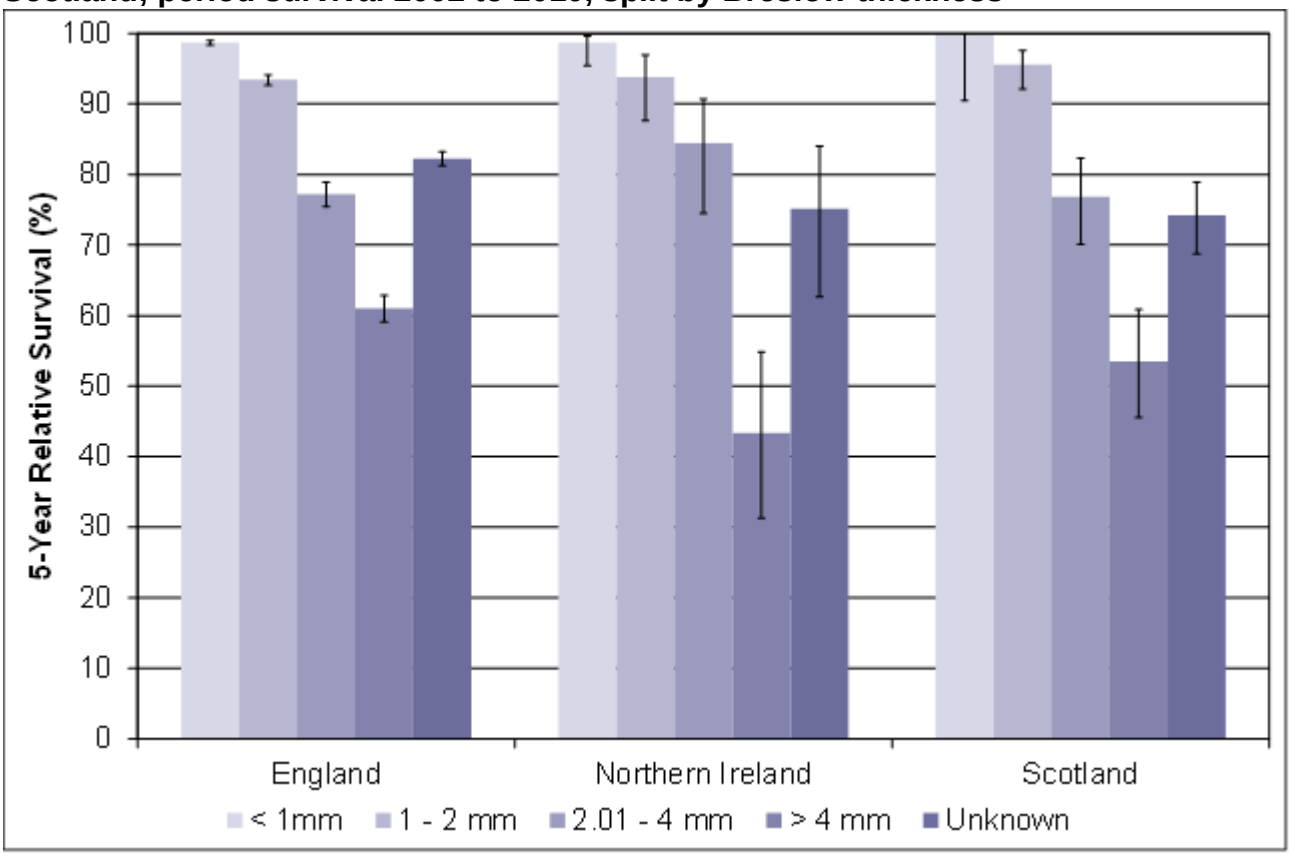
Table 7. Results of chi-square tests (df = 4 in all cases) exploring whether the distribution of melanomas by anatomical location and morphology vary with age group

Factor	England		Northern Ireland		Scotland	
	χ^2	p	χ^2	p	χ^2	p
Anatomical Location	2890	< .001	122	< .001	537	< .001
Morphology	3722	< .001	241	< .001	759	< .001

Tumour Thickness (Breslow thickness)

- relative survival was worse when tumours were thicker at diagnosis (Figure 3 and Table 8)
- the thickest tumours were more common amongst older males, and had a greater tendency to be on the head and neck, and of nodular morphology (Tables 9 and 10)

Figure 3. Five-year relative survival from melanoma in England, Northern Ireland, and Scotland; period survival 2002 to 2010, split by Breslow thickness



Source: Celtic NCDR 2010

Table 8. Results of z-tests (df = 1 in each case) exploring the difference in relative survival between the thickness categories of melanoma in each country

Country	z	p
England	38.3	< .001
Northern Ireland	8.7	< .001
Scotland	7.4	< .001

Table 9. Characteristics of the thickness of melanoma within the cohort, in terms of sex, age, anatomical location, and morphology of tumour at diagnosis

Factor		England		Northern Ireland		Scotland	
		< 1 mm	> 4 mm	< 1 mm	> 4 mm	< 1 mm	> 4 mm
Sex (%)	Male	42	53	37	53	40	54
	Female	58	47	63	47	60	46
Age at Diagnosis	Average	54.8	67.4	51.6	66.6	55.0	69.6
	95% CI	54.6 - 55	67 - 67.7	50.5 - 52.7	63.8 - 69.4	54.4 - 55.7	68.3 - 71
Anatomical Location (%)	Head and Neck	14	23	18	26	22	30
	Lower Limb & Hip	28	27	29	30	27	28
	Trunk	32	27	23	17	29	25
	Upper Limb & Shoulder	21	20	22	21	22	17
	Unspecified	5	2	8	6	1	1
Morphology (%)	Lentigo	6	3	14	4	16	5
	Nodular	2	37	5	56	1	39
	Superficial Spreading	63	21	68	13	64	24
	Other	2	7	2	12	9	20
	Unknown	27	33	12	15	10	13

Source: Celtic NCDR 2010

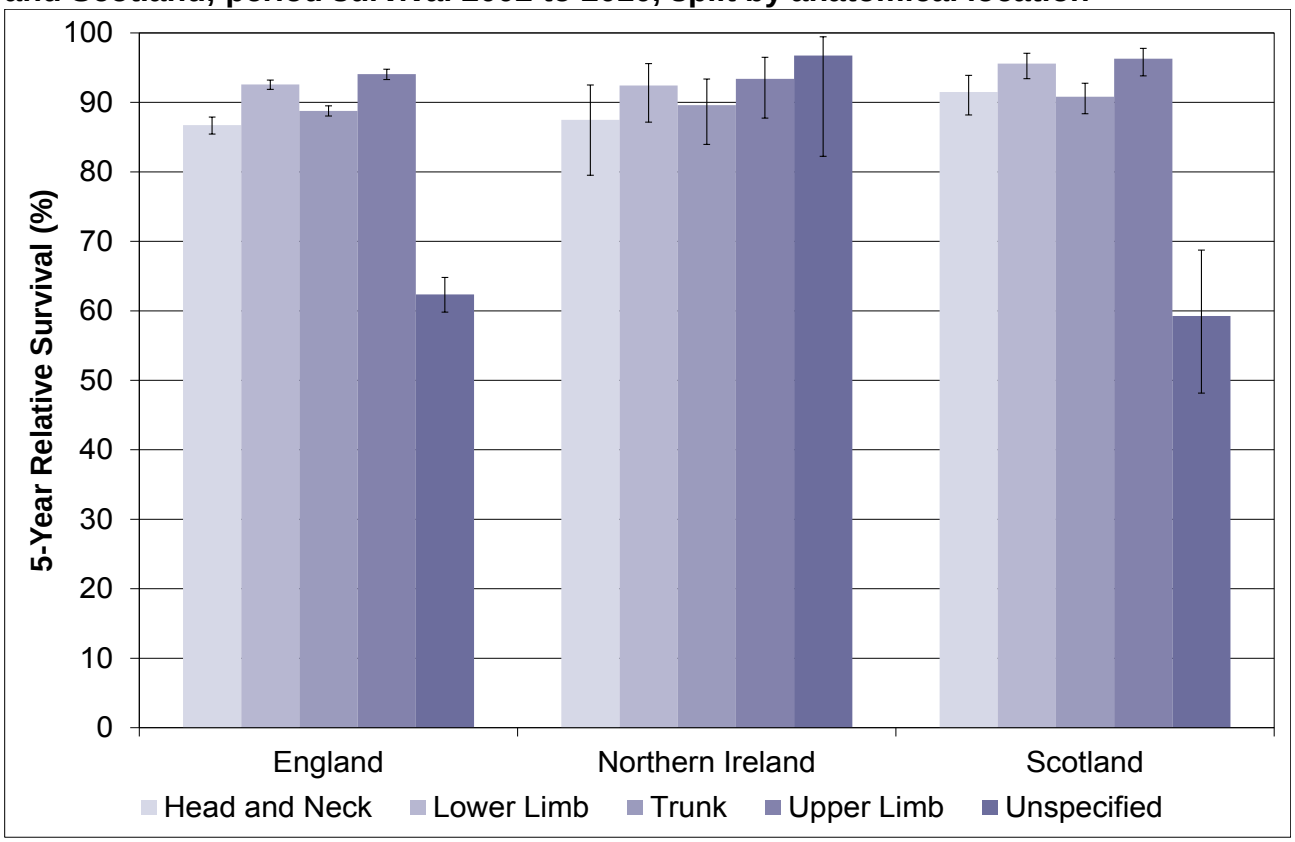
Table 10. Results of chi-square tests (df = 1 for sex, df = 4 otherwise) exploring whether the distribution of melanomas by sex, anatomical location and morphology vary between thickness of the melanoma

Factor	England		Northern Ireland		Scotland	
	χ^2	p	χ^2	p	χ^2	p
Sex	300	< .001	15	< .001	39	< .001
Anatomical Location	440	< .001	8	0.081	21	< .001
Morphology	9910	< .001	411	< .001	1138	< .001

Anatomical Location

- relative survival was poorer for melanomas on the head, neck, and trunk than for melanomas on the limbs (Figure 4)
- in England and Scotland, it was clear that there was a much worse prognosis for those melanomas without a specified anatomical location than for those with a specified location. This was not the casein Northern Ireland
- there were more tumours with an unknown morphology when the anatomical location was unspecified in all three countries (Tables 11 and 12) which was probably linked to recording issues

Figure 4. Five-year relative survival from melanoma in England, Northern Ireland, and Scotland; period survival 2002 to 2010, split by anatomical location



Source: Celtic NCDR 2010

Table 11. Characteristics of the specified and unspecified anatomical locations within the cohort, in terms of sex(%), age, Breslow thickness, and morphology of tumour at diagnosis (%)

Factor		England		Northern Ireland		Scotland	
		Unspecified	Specified	Unspecified	Specified	Unspecified	Specified
Sex(%)	Male	51	45	36	41	53	43
	Female	49	55	64	59	47	57
Age	Average	59.4	58.3	52.5	56.0	57.1	57.9
	95% CI	58.8 - 60	58.2 - 58.5	49.7 - 55.4	55.2 - 56.9	54.7 - 59.5	57.5 - 58.3
Breslow Thickness	Average	1.6	2.2	1.6	1.7	1.4	1.9
	95% CI	1.4 - 1.8	2.2 - 2.3	1.1 - 2.2	1.6 - 1.8	0.8 - 2	1.8 - 2
Morphology (%)	Lentigo	2	5	6	11	3	12
	Nodular	6	12	9	20	3	10
	Superficial Spreading	22	46	33	53	35	53
	Other	3	4	1	5	4	9
	Unknown	67	33	51	12	55	16

Source: Celtic NCDR 2010

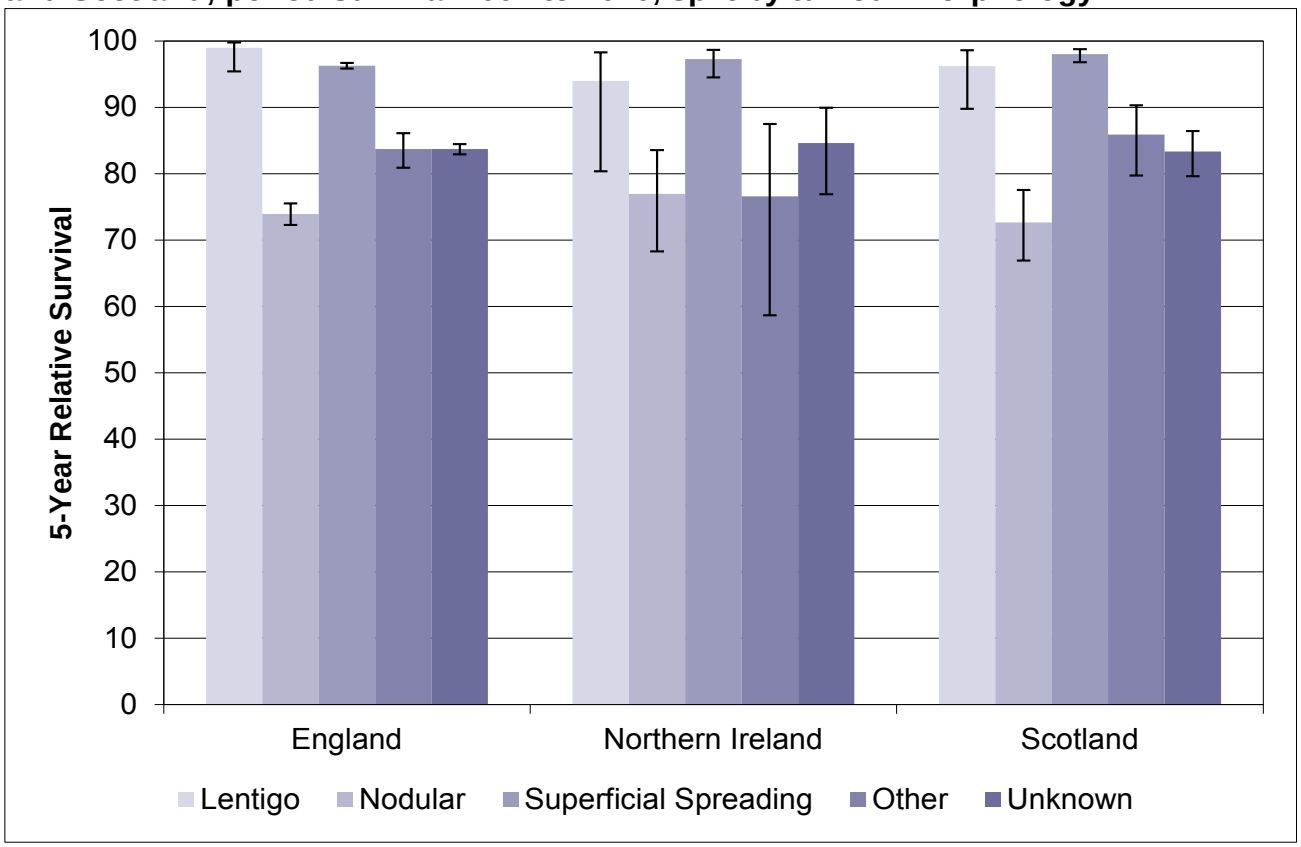
Table 12. Results of chi-square tests (df = 4) exploring whether the distribution of melanomas by morphology vary whether there is a specified or unspecified location in the cohort

Factor	England		Northern Ireland		Scotland	
	χ^2	p	χ^2	p	χ^2	P
Morphology	1547	< .001	179	< .001	251	< .001

Morphology

- nodular melanomas were associated with a poorer prognosis compared to lentigo and superficial spreading melanomas (Figure 5)
- nodular melanomas were thicker than the other morphologies, and could occur equally frequently anywhere on the body (Table 11)
- superficial spreading melanomas occurred more often in females, were associated with a younger age at diagnosis, and tended to be on the limbs and trunk (Table 13)
- lentigo tumours were associated with a much older age at diagnosis, and occurred mostly on the head and neck

Figure 5. Five-year relative survival from melanoma in England, Northern Ireland, and Scotland; period survival 2002 to 2010, split by tumour morphology



Source: Celtic NCDR 2010

Table 13. Characteristics of morphologies within the cohort, in terms of sex, age, Breslow thickness, and anatomical location of tumour at diagnosis

Factor		England			Northern Ireland			Scotland		
		Lentigo	Nodular	Superficial Spreading	Lentigo	Nodular	Superficial Spreading	Lentigo	Nodular	Superficial Spreading
Sex (%)	Male	49	51	43	46	43	39	47	50	41
	Female	51	49	57	54	57	61	53	50	59
Age	Average	72.8	64.4	54.9	71.2	59.5	49.9	71.5	64.3	53.5
	95% CI	72.4 - 73.2	64.1 - 64.8	54.7 - 55.1	69.5 - 73	57.7 - 61.4	48.9 - 51	70.6 - 72.4	63.1 - 65.6	53 - 54
Breslow Thickness	Average	1.5	4.8	1.4	1.1	3.3	1.0	1.2	5.0	1.2
	95% CI	1.4 - 1.6	4.6 - 4.9	1.3 - 1.4	0.9 - 1.3	3 - 3.7	0.9 - 1.1	1 - 1.3	4.6 - 5.4	1.2 - 1.3
Anatomical Location (%)	Head and Neck	77	20	9	77	19	10	86	23	9
	Lower Limb & Hip	7	26	31	4	34	32	3	26	33
	Trunk	6	28	35	5	18	29	5	26	33
	Upper Limb & Shoulder	9	23	22	10	24	24	5	25	23
	Unspecified	2	2	2	4	4	5	1	1	2

Source: Celtic NCDR 2010

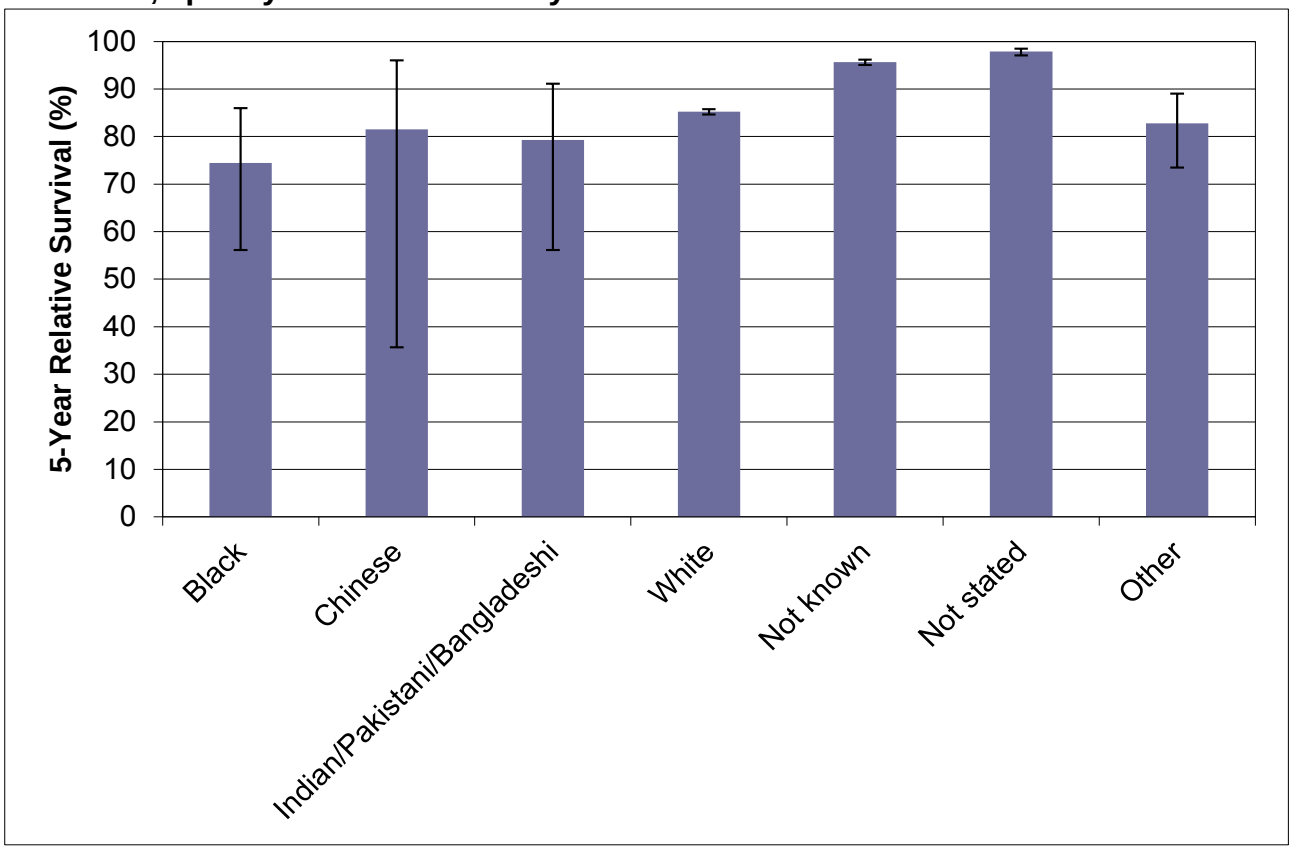
Table 14: Results of chi-square tests (df = 1 for sex; df = 4 for anatomical location) exploring whether the distribution of melanomas by sex and anatomical location vary with morphology

Factor	England		Northern Ireland		Scotland	
	X^2	p	X^2	p	X^2	p
Sex	183	< .001	5	0.078	28	< .001
Anatomical Location	10315	< .001	481	< .001	2609	< .001

Ethnicity

- it was difficult to discern clear conclusions from these data as there were so few people of stated black, Chinese, and Indian/Pakistani/Bangladeshi ethnicities who were diagnosed with melanoma, leading to large confidence intervals on the survival ratios. (58.6% of the cohort was white, 40.9% was unknown or not stated)

Figure 6. Five-year relative survival from melanoma in England; period cohort 2002-2010, split by recorded ethnicity

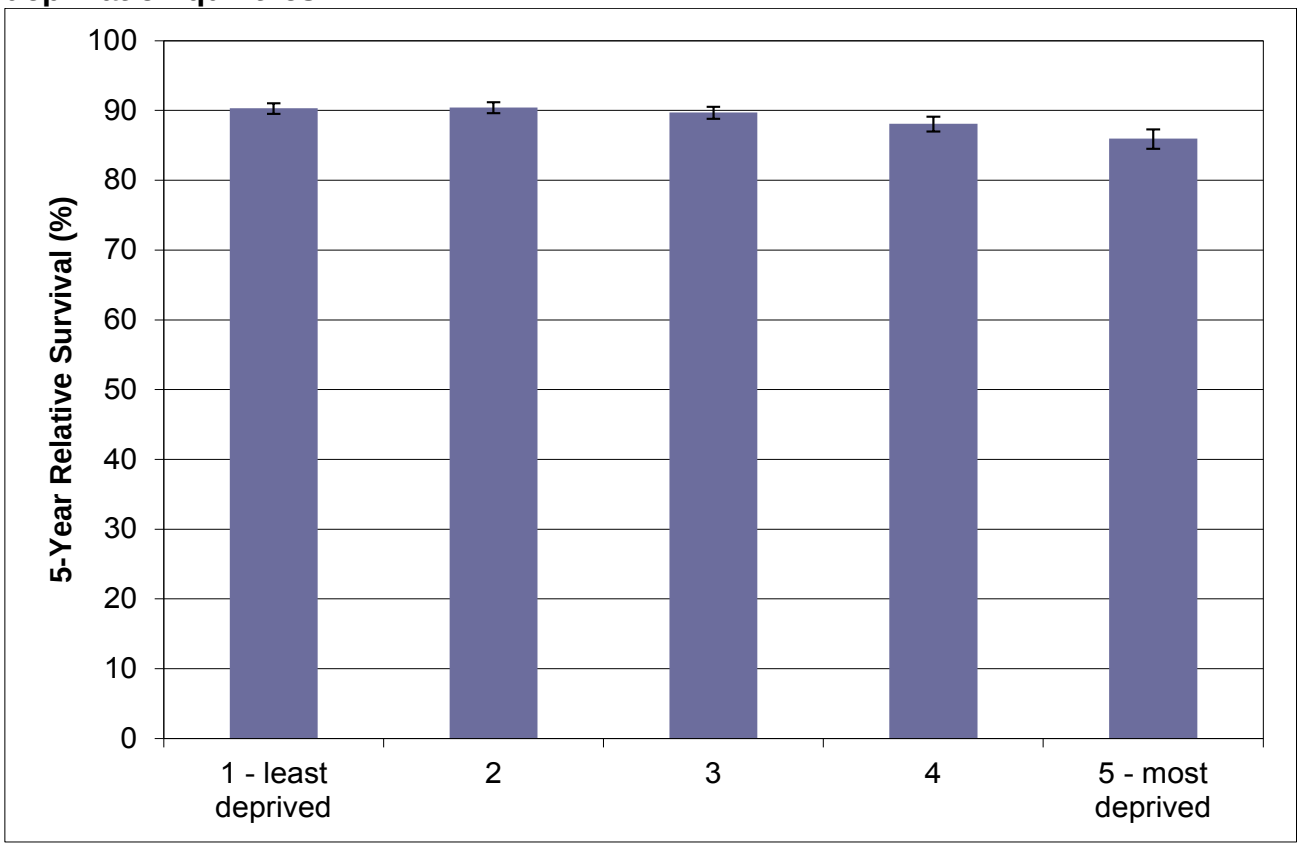


Source: Celtic NCDR 2010

Deprivation

- survival was poorer in the most deprived quintile compared to the least deprived quintile in England (Figure 7), even when controlling for the impact of deprivation on mortality in the general population ($z = 5.2$; $p < .001$)
- people in the most deprived quintile presented at a slightly younger age, with thicker tumours, and the tumours were slightly more likely to be on the head and neck and have a nodular morphology (Table 15)

Figure 7. Five-year relative survival from melanoma in England; 2002-2010, by deprivation quintiles



Source: Celtic NCDR 2010

Table 15. Characteristics related to deprivation quintiles in England within the cohort, in terms of sex (%), age, Breslow thickness, anatomical location (%) and morphology of tumour at diagnosis (%)

Factor		Least Deprived	Most Deprived
Sex(%)	Male	47	44
	Female	53	56
Age	Average	58.3	56.1
	95% CI	58 - 58.5	55.7 - 56.6
Breslow Thickness	Average	2.0	2.5
	95% CI	1.9 - 2	2.3 - 2.6
Anatomical Location (%)	Head and Neck	15	18
	Lower Limb & Hip	29	29
	Trunk	30	30
	Upper Limb & Shoulder	21	19
	Unspecified	5	5
Morphology (%)	Lentigo	4	5
	Nodular	11	13
	Superficial Spreading	47	42
	Other	3	4
	Unknown	34	37

Source: Celtic NCDR 2010

Table 16. Results of chi-square tests (df = 4) exploring whether the distribution of melanomas by anatomical location and morphology vary between deprivation quintiles

Factor	England	
	χ^2	p
Anatomical Location	38	< .001
Morphology	77	< .001

4. Conclusion

The incidence of melanoma is increasing fastest amongst older men in the UK as it is in other populations[8]. The reasons for the particular increase in older men is not yet fully understood, but as the exposures most strongly related to melanoma risk are recreational sun exposure and sunburn, it is likely that this increase reflects similar exposures in people born more than 60 years ago. These 'baby boomers' and older people did not generally travel so often to sunny holidays when young and it may therefore be that their increasing incidence reflects exposures in adult life. These factors are being explored by other research groups epidemiologically.

Men developed more melanomas on the head, neck, and trunk than women, and older men presented with thicker tumours than women or younger adults in the UK. This also is a well described pattern in epidemiological studies from other countries where men have been reported to have a poorer outcome[9,10].

The findings in this report indicate that this group in the UK also have a worse prognosis once diagnosed with melanoma. Studies using Dutch registry data and data from the EORTC clinical trials group have reported poorer survival from melanoma in men even when accounting for age, tumour thickness, anatomical location and morphology, indicating that there may be some biological difference in disease progression[11].

The results suggest that additional prevention and awareness campaigns that target men should be developed. There is a continuing need for primary prevention advice for all susceptible people but this study suggests that older people – especially men – should be targetted.

Primary prevention using 'SunSmart'-style advice; to cover up with clothing, use sun-cream for protection, and for the fair skinned or those with many moles to avoid sunbeds, also remains important. The increased incidence in older people suggests that avoidance of excessive sun exposure in adult life is important as well as in childhood.

The impact of various factors on five-year relative survival from melanoma was broadly the same between countries, making the findings robust, although a lack of power (particularly due to smaller cohorts in Scotland and Northern Ireland) sometimes prevented us from detecting effects.

5. References

1 Miles A, Waller J, Hiom S & Swanston, D. SunSmart? Skin cancer knowledge and preventive behaviour in a British population representative sample. Health education research 2005; 20(5), 579-585.

2 Diffey B L. The future incidence of cutaneous melanoma within the UK. British Journal of Dermatology 2004; 151(4), 868-872.

3 El Ghissassi F, Baan R, Straif K , Grosse Y, Secretan B, Bouvard V, Benbrahim-Tallaa L, Guha N, Freeman C, Galichet L, Cogliano V, on behalf of the WHO International Agency for Research on Cancer Monograph Working Group; A review of human carcinogens – Part D: radiation. The Lancet Oncology, 2009;10(8), 751-752. Available from: www.thelancet.com/journals/a/article/PIIS1470-2045%2809%2970213-X/fulltext.

4 www.ons.gov.uk/ons/taxonomy/index.html?nscl=Travel+and+Transport#tab-data-tables
Travel Trends - Section 1 Travel and Tourism, 1980 to 2014 (Excel sheet 155Kb)20-May-2015
International visits, nights and spending by UK and Overseas residents, 1980 to 2013 – access June 2015

5 Rachet B, Ellis L, Maringe C, Chu T, Nur U, Quaresma M, Shah A, Walters S, Woods L, Forman D & Coleman M; Socioeconomic inequalities in cancer survival in England after the NHS cancer plan. British Journal of Cancer 2010; 103(4), 446-453.

6 Cho H, Howlader N, Mariotto AB & Cronin K A. Estimating relative survival for cancer patients from the SEER Program using expected rates based on Ederer I versus Ederer II method. Surveillance Research Program, NCI, Technical Report# 2011, 1.

7 Brenner H & Hakulinen T. Advanced detection of time trends in long-term cancer patient survival: experience from 50 years of cancer registration in Finland. American Journal of Epidemiology 2002;156(6), 566-577.

8 Ives A. Malignant Melanoma in older persons, NCIN, PHE, July 2014

9 Joosse A, Collette S, Suciu S. Superior outcome of women with stage 1/11 cutaneous melanoma survival; female patients have a decreased risk of metastasis: J Invest Dermatol 2011; 131:719-26.
See comment in PubMed Commons below

10 Helvind N, Hölmich L, Smith S, Glud M, Andersen K, Dalton S, Drzewiecki K. Incidence of In Situ and Invasive Melanoma in Denmark From 1985 Through 2012: A National Database Study of 24 059 Melanoma Cases 2015; JAMA Dermatol. Jun 10. doi: 10.1001/jamadermatol.2015.1481.

11 Joosse A, de Vries E, Eckel R, Nijsten T, Eggermont AM, Hölzel D & Engel J. Gender differences in melanoma survival: female patients have a decreased risk of metastasis. Journal of Investigative Dermatology 2010;131(3), 719-726.