Title: Changes in the site distribution of common melanoma sub-types in Queensland, Australia over time: implications for public health campaigns.

Running head: Melanoma incidence trends in Queensland by body site, 1982-2008

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What's already known about this topic?
- The relationship between melanoma and sun exposure is complex and appears to vary by age, anatomical site and morphology.
- Until recently, the greatest increases in melanoma incidence have been on intermittently exposed sites such as the trunk, arms and legs.
- Increasing incidence rates are mainly due to superficial spreading melanoma.

What does this study add?
- Evidence that melanoma incidence trends by age group are either stabilising or decreasing in a high-risk population, particularly on intermittently exposed sites.
- Evidence that incidence rates of superficial spreading melanoma have plateaued on intermittently exposed sites, while the incidence of nodular melanoma is currently declining on the trunk and lower limbs.
- The first suggestive indication of the emerging success of sun protection campaigns in Australia based on site-specific trends.

Summary

Background: An examination of melanoma incidence according to anatomical region may be one method of monitoring the impact of public health initiatives.

Objectives: To examine melanoma incidence trends by body site, sex and age at diagnosis or body site or body site and morphology in a population at high risk.

Materials and methods: Population-based data on invasive melanoma cases (n=51,473) diagnosed between 1982 and 2008 were extracted from the Queensland Cancer Registry. Age-standardised incidence rates were calculated using the direct method (2000 world standard population) and Joinpoint regression models were used to fit trend lines.

Results: Significantly decreasing trends for melanomas on the trunk and upper limbs/shoulders were observed during recent years for both sexes under the age of 40 years and among males aged 40 to 59 years. However, in the 60 and over age group, the incidence of melanoma is continuing to increase at all sites (apart from the trunk) for males and on the scalp/neck and upper limbs/shoulders for females. Rates of nodular melanoma are currently decreasing on the trunk and lower limbs. In contrast, superficial spreading melanoma is significantly increasing on the scalp/neck and lower limbs, along with substantial increases in lentigo maligna melanoma since the late 1990s at all sites apart from the lower limbs.

Conclusions: In this large study we have observed significant decreases in rates of invasive melanoma in the younger age groups on less frequently exposed body sites. These results may provide some indirect evidence of the impact of long-running primary prevention campaigns.

Introduction

Melanoma is the most rapidly increasing type of cancer in fair-skinned populations throughout the world.[1] The state of Queensland in Australia has the highest recorded incidence of melanoma with an age-standardised (2000 World Standard Population)[2] rate of 59.1/100,000 and 42.2/100,000 for males and females respectively between 2004 and 2008.[3]

Sun exposure is the main environmental risk factor for melanoma,[1,4,5] although there is evidence that the relationship between melanoma and patterns of sun exposure varies according to age, site and morphology.[6,7] After adjusting for body surface area, rates of melanoma tend to be highest on intermittently exposed sites among people under 40 years of age such as the trunk for younger men and the lower limbs for younger women, whereas for men and women over the age of 60 years melanoma is most commonly found on more chronically exposed sites such as the head and neck.[8]

International studies have reported that the greatest increases in melanoma incidence were occurring on the trunk, arms and/or legs, although trends vary by age and gender.[9-17] The large increases in melanoma incidence on these intermittently exposed body sites (that is, the parts of the body that are usually covered by clothing) are likely to reflect modifications to lifestyle in the second half of the last century, such as changes in clothing coverage combined with the popularisation of recreational sun exposure.[9-11,13-17]

Public health campaigns aimed at decreasing sun exposure and increasing sun protection behaviours have been operating in many countries since the 1980's, and Australia has been at the forefront of promoting the sun safety message. The aim of our study was to examine trends in the

incidence of melanoma by body site in a population at high risk of melanoma and assess these results in terms of the possible effectiveness of primary prevention programs in this country. Against a historic background of increasing melanoma incidence trends in Queensland, we hypothesise that any reductions in intermittently exposed body sites are likely to provide supportive evidence for the positive impact of skin protection campaigns.

Materials and Methods

De-identified data were obtained from the Queensland Cancer Registry (QCR), a population-based cancer registry which collects and maintains records of all invasive and *in situ* cancers (excluding non-melanoma skin cancer) diagnosed in Queensland, Australia. Invasive cases of primary melanoma of the skin (defined as site C44 using the International Classification of Diseases for Oncology, 3rd edition (ICD-O-3)[18]) diagnosed from 1982 to 2008 were extracted. Available details included sex, age at diagnosis and histological subtype (morphology). Cases were only included where the histology was based on complete excision of the melanoma. Thus, incisional biopsies, shave excisions or cases of metastatic melanoma were excluded.

For the purposes of this study, morphology was restricted to nodular melanoma (NM; M8721), lentigo maligna melanoma (LMM; M8742), superficial spreading melanoma (SSM; M8743), and melanoma not otherwise specified (MNOS; M8720). Other specific histological subtypes such as desmoplastic melanoma, melanoma arising within a blue naevus and nevoid melanoma were excluded due to relatively small numbers annually. Acral lentigenous melanomas (which represented less than 0.5% of cases) were also excluded as they are more commonly found on the soles of the feet and palms of the hand.

Anatomical sites were grouped as follows: face/ears (ICD-0-3 codes C44.0-C44.3), scalp/neck (C44.4), trunk (C44.5), upper limbs/shoulders (C44.6), lower limbs (C44.7) and site not specified (C44.9). Overlapping lesions of the skin (C44.8) and subungal melanomas of the hand or foot were excluded. For the calculation of site-specific trends, only the first invasive melanoma diagnosed on each body site was included; however we included only the first invasive melanoma diagnosed for each person when calculating trends for the whole body.

Ethics committee approval was not required for this study as only de-identified data was used.

Analysis

Analyses were conducted by site, sex and broad age group at diagnosis (< 40 years, 40-59 years and ≥ 60 years) as well as site by morphology. Directly age-standardised rates were calculated for each year between 1982 and 2008, using the 2000 World Standard Population.[2]

Joinpoint regression models[19] were then used to fit trend lines to the log of the age-standardised rates. A joinpoint is the point at which there is significant change in the underlying trend, either in terms of direction or magnitude. The modelling process starts with the assumption of constant change over time (i.e. no joinpoint) and tests whether adding joinpoints at various intervals would significantly improve the fit of the model. All of the resulting combinations of possible trend lines are compared using Monte Carlo permutation tests[19] and the option with the fewest joinpoints which provides the best fit to the observed data is chosen as the final model. A maximum of two joinpoints were specified in each model, with a minimum of five years between joinpoints (or between a joinpoint and either end of the series).

All trends were analysed over the entire study period and have been represented graphically. However, for simplicity, if there was a significant change detected in the linear trend, then only the trend for the most recent linear segment was reported in the corresponding table. Trends were expressed in terms of annual percentage change with corresponding 95% confidence intervals. A two-sided t-test was used to determine whether the annual percentage change was statistically significant ($p < 0.05$).

Results

Of a total of 58,561 invasive melanomas, 51,473 (88%) were eligible for inclusion in the study. The majority of the exclusions were comprised of morphology types outside of those specified (n=5,468) or multiple primary melanomas occurring on the same body site for the same person (n=1,595), along with a small number of overlapping lesions of the skin, subungal melanomas of the hand or foot, or records where age was missing (total of n=25).

Table 1 gives an overview of key characteristics of the cases that were included. Within the study group, melanomas occurred more frequently among males (57%) and people aged 60 years and over (45%). A third of melanomas (33%) were on the trunk, followed by the upper limbs and shoulders (23%) and lower limbs (21%), while site was not specified for 6%. Over half (55%) of the melanomas were classified as SSM, 9% were NM, 6% were LMM and the remaining 29% were MNOS (Table 1).

Trends by sex, age group and body site

Following generally increasing incidence rates during the 1980s and 1990s, there has been recent evidence of either a plateau or a decrease for all invasive melanomas combined within each age

and gender group, with significantly decreasing trends observed for both males and females under 60 years of age (Table 2, Fig. 1a for males and Fig. 2a for females).

Reflecting these overall trends, the incidence of invasive melanomas on the trunk and upper limbs/shoulders has been decreasing over the last few years among males aged under 60 years (Table 2, Figs. 1d and 1e). The only other groups for which a significant decrease in melanoma incidence was recorded were on the upper limbs/shoulders for younger females (Fig. 2e) and on the face and ears among females aged 60 years and over (Fig 2b). There was also some indication (albeit non-significant) that incidence rates had peaked for melanomas on the trunk among older males and for all females (Figs. 1d and 2d), as well as on the lower limbs among females under 60 years of age (Fig. 2f).

In contrast, incidence rates of invasive melanoma have continued to significantly increase on the face and ears for males aged 60 years and over (Table 2 and Fig. 1b), on the scalp and neck for males and females over 40 years (Figs. 1c and 2c), on the upper limbs and shoulders for both sexes over 60 years (Figs. 1e and 2e), and on lower limbs for males 40 years and older (Fig. 1f).

Trends by morphology and body site

Incidence trends varied substantially by morphology type. Rates of SSM increased over the entire study period and rates of LMM increased significantly from 1999 onwards (Table 3). In contrast, incidence rates for both NM and MNOS decreased significantly after the mid-1990s.

The large increasing trend for LMM was generally consistent across all body sites (Table 3), while significantly increasing incidence rates for SSM were confined to the scalp/neck and lower limbs

(Figs. 3c and 3f), with stable trends for SSM at other body sites. Decreasing trends for NM were only evident for the trunk and lower limbs (Figs. 3d and 3f), while incidence rates of MNOS were found to be decreasing at all sites other than the scalp and neck.

Changes in data quality

There were large, significant decreases in the incidence rate of invasive melanomas where body site was not specified, irrespective of sex or age at diagnosis. These trends usually began around the late 1980s/early 1990s (Table 2).

Discussion

This large study examined trends in the overall and site-specific incidence of melanoma in a population with the highest rates of skin cancer in the world. The data series began around the time that primary prevention campaigns were first implemented in Australia.

As noted in the Introduction, research from elsewhere around the world over recent decades has generally shown persistent increases in the overall incidence of melanoma.[12-17] We observed that the total rates of invasive melanoma had either peaked or at least stabilised for both sexes and in all age groups, with statistically significant decreases among both males and females under the age of 60 years from around the late 1990s onwards. In terms of demographics and body site, decreasing trends mainly occurred for melanomas among younger people on the trunk or upper limbs/shoulders, parts of the body that receive intermittent exposure and can be easily protected from the sun by the wearing of suitable clothing. This is consistent with improved sun protection behaviours, and therefore a possible indication of the impact of public health initiatives designed to reduce sun exposure. In line with our findings, some evidence is also emerging in Australia and

other countries that rates are stabilising within younger cohorts and/or for less exposed parts of the body.[20-23]

Data from Australian population surveys has revealed an increase in the use of sunscreen, along with more frequent use of body covering during summer when outdoors.[24,25] It may seem reasonable to expect that improvements in sun protection behaviours would be reflected in a decrease in melanoma rates for body sites which in the past were often left uncovered, such as the head and neck. However, since the body site distribution of melanoma varies by age at diagnosis, the association between sun exposure and the development of melanoma is likely to be complex. This was first explored by Mishima in the 1960's.[26] Whiteman and colleagues then put forward a '*theory of divergent pathways'*, where one pathway is associated with instability of melanocytes in naevus-prone individuals who require only intermittent exposure, while the other course involves melanocytic proliferation coupled with chronic sun exposure.[6,27] Further work has shown that melanoma of the head and neck was significantly more likely to be associated with higher levels of chronic sun exposure compared to melanoma occurring on the trunk.[6,28] While we found that rates of melanoma on the head and neck continued to increase among people aged 60 years and over, this needs to be interpreted after considering that the sun damage had already occurred within this cohort, and so there will likely be a lag in observing any improvement in incidence rates on these sites among older people.

Among the few papers that have been published on incidence rate trends for melanoma by morphological type, the consensus finding was that increases in overall melanoma trends were mainly driven by rises in the incidence of SSM.[13,29-32] For this reason the stabilising trends we have observed for SSM at some sites, such as the trunk and upper limbs/shoulders, are encouraging.

SSMs are more commonly diagnosed on body sites associated with intermittent exposure.[6,7] Furthermore, these melanomas are known to frequently arise in a pre-existing naevus, and naevi development is strongly associated with sun exposure during childhood.[33,34] Thus, the stabilisation of rates of SSM on intermittently exposed sites may again point towards the success of the public health message aimed at reducing the development of melanoma.

To the best of our knowledge, a significant decline in the incidence of NM has not previously been reported elsewhere. Although not presented, we found no evidence of increasing rates of NM (significant or otherwise) by age group. To the contrary, rates of NM were reported to be increasing among people over 60 years of age in Scotland up to 2003.[32] However that study did not further stratify trends by body site, and therefore cannot be directly compared with our more detailed results. It appears that the overall incidence trend for NM in Queensland was driven to a large extent by decreases in rates on the trunk and lower limbs. As NM is strongly associated with sunburn (more so than SSM or LMM),[35] it is another possible indication that we are beginning to reap the benefits of programs that highlight sun awareness and avoiding sunburn through the wearing of protective clothing and the application of sunscreen.[24] The importance of a decrease in the incidence of NM is further heightened by their typically aggressive growth rate which tends to result in poorer prognosis.[36,37]

Similar to our findings, Levi *et*. *al*.[31] found that the incidence of LMM increased for both males and females in parts of Switzerland between 1978 and 2002, as did MacKie *et*. *al*.[32] among older people (60 years and over) in Scotland between 1979 and 2003. Our finding of a significant increase in LMM most likely reflects that this type of melanoma is more strongly associated with long-term sun exposure and its known precursor lesion (Hutchinson's melanotic freckle), which

tends to grow slowly for up to 15 years before invasion occurs.[38] Considering that public health campaigns aimed at reducing sun exposure did not begin until the 1980s, it is anticipated that we would not observe a decrease in rates of this type of melanoma until some time in the future.

The reducing incidence of MNOS at sites such as the trunk, upper limbs and shoulders appears to be similar to the trends observed for SSM and is possibly associated with reductions in sun exposure at these intermittently exposed sites. It has been suggested that some melanomas classified as MNOS may have components of SSM but these components are not evident on histological examination.[36]

There are some limitations to our study. While the data were obtained from a population-based cancer registry where cancer is by law a notifiable disease, there may still be some underreporting of cases; based on previous research we believe this would be very minimal for invasive melanomas.[39] Site of melanoma was not recorded for about 6% of invasive lesions throughout the study. However, the recording of body site and morphology improved in later years and therefore could have some impact on the reported trends. Finally, melanoma incidence rates are generally characterised by fluctuations, so it is possible that some of the recent decreases might be spurious rather than representing a real change in the underlying trend.

While for 29% of cases the histology was recorded as MNOS, this proportion is somewhat less than that reported in a number of other large series. For example, Crocetti *et* al. [40] reported that 42% of over 16,200 cases in Italy were classified as MNOS. A large study of U.S. SEER (Surveillance, Epidemiology and End Results Program) data from 1978 to 2007 also found that MNOS accounted for 41% of over 111,000 cases of invasive melanoma. [41] The authors further compared trends in

incidence of MNOS with known subtypes and suggested the trends were similar to those of SSM, in agreement with our findings. [41]

In conclusion, based on a large population-based cohort at high risk for melanoma we have observed significant decreases in rates of invasive melanoma in younger age groups and in particular for sites that are typically intermittently exposed. These findings are supported by an analysis of melanoma incidence stratified by morphology and site which showed that rates had stabilised or were decreasing for the combinations of morphology and site typically associated with irregular sun exposure. It is therefore possible that we now have indirect evidence that long-running primary prevention campaigns may have contributed to these trends. Of potential concern is that rates of melanoma that are most likely caused by chronic sun exposure are continuing to increase, thereby representing a potential focus for future public health strategies.

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Figure Legends

Fig. 1: Trends for incidence rates of invasive melanoma by broad age group and site among males, Queensland, 1982-2008. Trends were based on rates that were age standardised to the WHO World Standard Population (2000) and modelled using joinpoint regression (www.srab.cancer.gov/joinpoint). Y-axis is shown on a log scale and the scale is not the same for each graph.

Fig. 2: Trends for incidence rates of invasive melanoma by broad age group and site among females, Queensland, 1982-2008. Trends were based on rates that were age standardised to the WHO World Standard Population (2000) and modelled using joinpoint regression (www.srab.cancer.gov/joinpoint). Y-axis is shown on a log scale and the scale is not the same for each graph.

Fig. 3: Trends for incidence rates of invasive melanoma by morphology and site, Queensland, 1982-2008. Abbreviations: SSM = superficial spreading melanoma; NM = nodular melanoma; LMM = lentigo maligna melanoma; MNOS = melanoma not otherwise specified. Trends were based on rates that were age standardised to the WHO World Standard Population (2000) and modelled using joinpoint regression (www.srab.cancer.gov/joinpoint). Y-axis is shown on a log scale and the scale is not the same for each graph.

Table 1: Patient and clinical characteristics of invasive melanomas diagnosed in Queensland, 1982-2008

Characteristic	Invasive		
	n[a]	%	ASR (95% CI)[b,c]
Total	51,473	100.0	50.5 (50.1-51.0)
Sex			
Males	29,431	57.2	59.0 (58.3-59.6)
Females	22,042	42.8	43.4 (42.8-43.9)
Age group			
< 40 years	10,276	20.0	18.0 (17.6-18.3)
40-59 years	17,940	34.9	83.6 (82.4-84.8)
60+ years	23,257	45.2	167.0 (164.8-169.2)
Period of diagnosis			
1982-1988	8,055	15.6	42.9 (42.0-43.9)
1989-1993	7,539	14.6	46.3 (45.3-47.4)
1994-1998	10,109	19.6	53.5 (52.5-54.6)
1999-2003	12,416	24.1	56.4 (55.4-57.4)
2004-2008	13,354	25.9	51.0 (50.1-51.9)
Site			
Face/Ears	5,079	9.9	4.6 (4.5-4.8)
Scalp/Neck	2,979	5.8	2.9 (2.8-3.0)
Trunk	17,223	33.5	17.3 (17.1-17.6)
Upper limbs/Shoulders	12,018	23.3	11.7 (11.5-11.9)
Lower limbs	10,947	21.3	10.9 (10.7-11.1)
Not specified	3,227	6.3	3.1 (3.0-3.2)
Morphology			
Superficial spreading melanoma	28,258	54.9	28.3 (28.0-28.6)
Nodular melanoma	4,791	9.3	4.5 (4.3-4.6)
Lentigo maligna melanoma	3,292	6.4	2.9 (2.8-3.0)
Melanoma not otherwise specified	15,132	29.4	14.9 (14.7-15.2)

Notes: a. Counts may include more than one melanoma at different sites for the same person.
b. Rates are age standardised to the WHO World Standard Population (2000) and expressed per 100,000 population.
c. Figures in brackets correspond to the 95% confidence interval for the age standardised rate.

Table 2: Recent trend information for incidence rates of invasive melanoma by sex, broad age group and site, Queensland, 1982-2008

Site	Males				Females			
	n[a,b]	Most recent trend	Annual percentage change[c-e] (95% CI)	p	n[a,b]	Most recent trend	Annual percentage change[c-e] (95% CI)	p
<40 years								
All sites	4,601	1997-2008	-3.8 (-5.6,-2.0)	<0.001	5,474	2000-2008	-3.4 (-6.7,-0.1)	0.043
Face/Ears	270	1982-2008	+0.9 (-0.6,+2.5)	0.228	260	1982-2008	+0.7 (-0.7,+2.1)	0.346
Scalp/Neck	324	1982-2008	+0.6 (-0.8,+2.1)	0.369	272	1982-2008	+1.0 (-0.4,+2.4)	0.158
Trunk	2,142	1998-2008	-6.0 (-8.7,-3.3)	<0.001	1,858	1999-2008	-3.8 (-7.6,+0.1)	0.054
Upper limbs/Shoulders	862	1988-2008	-1.2 (-2.4,-0.0)	0.044	1,292	1982-2008	-0.9 (-1.7,-0.1)	0.030
Lower limbs	803	1982-2008	-0.5 (-1.4,+0.4)	0.231	1,646	2003-2008	-7.8 (-15.3,+0.4)	0.060
Not specified	298	1992-2008	-9.9 (-14.4,-5.2)	<0.001	249	1988-2008	-9.9 (-13.5,-6.1)	<0.001
40-59 years								
All sites	9,590	2000-2008	-2.6 (-5.0,-0.1)	0.043	7,707	1998-2008	-1.7 (-3.2,-0.3)	0.020
Face/Ears	748	1982-2008	+0.5 (-0.7,+1.7)	0.400	434	1982-2008	+0.3 (-1.4,+2.0)	0.730
Scalp/Neck	594	1982-2008	+1.3 (+0.2,+2.4)	0.020	289	1982-2008	+1.6 (+0.2,+3.1)	0.028
Trunk	4,549	2000-2008	-3.5 (-6.4,-0.4)	0.031	2,079	1998-2008	-1.5 (-3.6,+0.6)	0.145
Upper limbs/Shoulders	1,960	2000-2008	-4.3 (-7.5,-1.0)	0.014	2,102	1982-2008	+0.5 (-0.2,+1.3)	0.142
Lower limbs	1,470	1982-2008	+1.6 (+0.7,+2.6)	0.001	2,641	2001-2008	-3.8 (-8.0,+0.5)	0.081
Not specified	662	1982-2008	-4.1 (-5.7,-2.6)	<0.001	412	1991-2008	-8.9 (-12.0,-5.7)	<0.001
60+ years								
All sites	13,538	1998-2008	+0.4 (-0.8,+1.6)	0.524	8,086	2002-2008	-1.5 (-4.2,+1.2)	0.252
Face/Ears	2,087	1982-2008	+2.1 (+1.4,+2.9)	<0.001	1,280	2002-2008	-5.1 (-9.1,-1.0)	0.018
Scalp/Neck	1,106	1982-2008	+3.4 (+2.7,+4.1)	<0.001	394	1982-2008	+2.4 (+1.2,+3.5)	<0.001
Trunk	5,324	1999-2008	-1.1 (-2.8,+0.7)	0.221	1,271	2002-2008	-1.0 (-5.9,+4.2)	0.698
Upper limbs/Shoulders	3,378	1982-2008	+3.1 (+2.4,+3.8)	<0.001	2,424	1982-2008	+2.3 (+1.6,+2.9)	<0.001
Lower limbs	1,788	1982-2008	+3.5 (+2.8,+4.3)	<0.001	2,599	1987-2008	+0.7 (-0.3,+1.7)	0.141
Not specified	1,066	1998-2008	-6.3 (-9.5,-3.0)	0.001	540	1989-2008	-4.7 (-6.6,-2.8)	<0.001

Notes: a. "n" is the total number of cases by sex, age group and site between 1982-2008.
b. Counts may include more than one melanoma at different sites for the same person, but each person is only included once in the count and trend calculation for "All sites".
c. Trends were based on rates that were age standardised to the WHO World Standard Population (2000).
d. Figures in brackets correspond to the 95% confidence interval for the annual percentage change.
e. Shaded cells indicate statistically significant trends.

Table 3: Recent trend information for incidence rates of invasive melanoma by morphology and site, Queensland, 1982-2008

Site	n[a,b]	Most recent trend	Annual percentage change[c-e] (95% CI)	p
Superficial spreading melanoma				
All sites	27,399	1982-2008	+1.2 (+0.7,+1.8)	<0.001
Face/Ears	1,836	1999-2008	-2.2 (-5.1,+0.7)	0.122
Scalp/Neck	1,456	1982-2008	+2.7 (+1.7,+3.6)	<0.001
Trunk	10,537	1999-2008	-1.4 (-3.8,+0.9)	0.219
Upper limbs/Shoulders	7,025	2000-2008	-1.0 (-3.5,+1.6)	0.424
Lower limbs	6,790	1982-2008	+0.9 (+0.3,+1.5)	0.006
Not specified	614	1988-2008	-13.9 (-16.6,-11.2)	<0.001
Nodular melanoma				
All sites	4,762	1995-2008	-2.2 (-3.6,-0.7)	0.005
Face/Ears	571	1982-2008	+0.1 (-1.1,+1.3)	0.912
Scalp/Neck	367	1982-2008	+1.4 (-0.0,+2.9)	0.054
Trunk	1,447	1996-2008	-2.8 (-5.2,-0.3)	0.031
Upper limbs/Shoulders	1,222	2000-2008	-0.8 (-1.8,+0.2)	0.125
Lower limbs	1,068	2002-2008	-7.7 (-14.6,-0.2)	0.046
Not specified[f]	116		–	
Lentigo maligna melanoma				
All sites	3,256	1999-2008	+7.0 (+4.8,+9.2)	<0.001
Face/Ears	1,369	2001-2008	+8.9 (+2.9,+15.3)	0.005
Scalp/Neck	330	1998-2008	+7.2 (+1.8,+12.8)	0.011
Trunk	503	1997-2008	+6.5 (+2.5,+10.7)	0.002
Upper limbs/Shoulders	754	2000-2008	+7.1 (+1.6,+12.8)	0.013
Lower limbs	276	1982-2008	-0.4 (-1.9,+1.2)	0.618
Not specified[f]	60		–	
Melanoma not otherwise specified				
All sites	14,898	1997-2008	-4.0 (-5.8,-2.1)	<0.001
Face/Ears	1,303	2002-2008	-7.1 (-13.4,-0.3)	0.041
Scalp/Neck	826	1982-2008	+1.0 (-0.5,+2.5)	0.179
Trunk	4,736	1997-2008	-5.4 (-7.1,-3.6)	<0.001
Upper limbs/Shoulders	3,017	1997-2008	-2.9 (-5.5,-0.2)	0.038
Lower limbs	2,813	1996-2008	-2.9 (-4.8,-0.9)	0.006
Not specified	2,437	1996-2008	-5.3 (-7.8,-2.7)	<0.001

Notes:
a. "n" is the total number of cases by morphology and site between 1982-2008.
b. Counts may include more than one melanoma at different sites for the same person, but each morphology group is only included once in the count and trend calculation for "All sites".
c. Trends were based on rates that were age standardised to the WHO World Standard Population (2000).
d. Figures in brackets correspond to the 95% confidence interval for the annual percentage change.
e. Shaded cells indicate statistically significant trends.
f. There were an insufficient number of cases to calculate trend estimates where site was not specified for either nodular melanoma or lentigo maligna melanoma.