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Baseline assessment of sentinel lymph node biopsy practice across England for melanoma patients, 2005-2009

Skin SSCRG

December2012

SOUTH WEST PUBLIC HEALTH OBSERVATORY

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Aim and Objectives

To undertake a baseline assessment of sentinel lymph node biopsy practice for melanoma patients across England between 2005 and 2009.

Introduction

The use of Sentinel Lymph Node Biopsy (SLNB) is considered by many specialists to be a useful staging tool for patients diagnosed with melanoma and is utilised as such in clinical trials but has also been the focus of controversy.

The sentinel lymph node is the first lymph node(s) to which cancer cells are most likely to spread via lymphatics from a primary tumour such as a melanoma. SLNB helps in the staging of the disease allowing an estimation of prognosis, and may help some patients avoid more extensive (and therefore more morbid) lymph node surgery at a later date (National Cancer Institute).

There are good published data to show the value of SLNB as a staging tool, although risk estimation using clinic-pathological features have been shown to be nearly as strong. Its prognostic value is such that SLNB is a component of the American Joint Committee on Cancer staging system for melanoma and therefore a stratification tool in clinical trials. There is no evidence as yet of survival value from the procedure however, and therefore the cost/benefit ratio of the procedure is still being evaluated (NICE IOG 2006, Morton et al, 2006, Rughani et al 2011, Mitra et al 2010).

The use of SLNB is based on the pathological stage of the tumour, patient choice and overall health status as the procedure requires a general anaesthetic.

The current revised UK guidelines for the management of cutaneous melanoma 2010 state that SLNB can be considered in AJCC stage IB to 2C melanoma by the specialist skin cancer multidisciplinary teams (SSMT) (Marsden et al 2010). Although the procedure is now more readily available across England, there are still Cancer Networks not offering the procedure and therefore creating an inequality of care for the patients.

The NCIN Skin Cancer Site Specific Clinical Reference Group (Skin SSCRG) decided to undertake a project on the proportion of patients having the procedure in England. This would not only give a baseline assessment of the variation in practice of the procedure but also highlight coding issues. In order to achieve this, the proportion of melanoma cases receiving SLNB was examined according to age, sex, melanoma clinical factors, social class and geographical region.

Methodology

Data on melanoma (ICD-10 C43) cases resident in England and diagnosed between 2005 and 2009 were extracted from the latest National Cancer Data Repository (NCDR). This formed the basis of the analysis to determine what proportion of cases received a sentinel lymph node biopsy (SLNB).

SLNB procedures for melanoma were identified using Inpatient Hospital Episode Statistics (IPHES). These admissions were identified where melanoma was recorded in one of the diagnosis fields and a SLNB procedure code (as specified in Table A1 in Appendix 1) was recorded in one of the operation fields. An admission may have more than one procedure code recorded. Admission details between 2005 and 2010 for patients resident in England were extracted. This time period was extended in order to increase data capture of procedures being carried out for 2005-2009 diagnoses. The number of these admissions by treating Trust was examined to assess whether any variation in practice existed.

The NCDR extract was linked to the IPHES extract using NHS number only. The proportion of melanoma cases that received a SLNB was examined by the following factors: year of diagnosis; sex; age; socio-economic deprivation - National Income deprivation quintile; Cancer Network of residence to assess geographical variation; Breslow thickness to provide an indication of the stage of the cancer at time of diagnosis; anatomical site of melanoma; and type (morphology) of melanoma. Full AJCC staging is currently poorly recorded and therefore could not be used.

These two data extracts could not be matched by tumour, and therefore it is possible that for some cases, the SLNB admission, although matched to the correct patient, was not linked to the correct tumour registration. For patients with multiple primary melanomas diagnosed, the tumour with the diagnosis date that was closest to the date of admission for the SLNB was taken.

Results

1 Coding

1.1 Details of procedure codes used to record SLNB procedures

Table 1: Number of melanoma SLNB admissions by SLNB procedure code, 2005-2009 admission years, England.

SLNB code (OPCS4)	SLNB code description	Admission Year					
		2005	2006	2007	2008	2009	2005-09
O142-T86	Sentinel lymph node with sampling	-	-	1	27	40	68
O142-T87	Sentinel lymph node with excision or biopsy of lymph node	-	-	55	291	456	802
T86	Sampling of lymph node	88	81	32	21	27	249
T87	Excision or biopsy of lymph node	651	448	242	240	218	1,799
T911	Biopsy of lymph node NEC*	-	249	360	218	202	1,029
Other	Other	1	4	8	16	19	48
Total		740	782	698	813	962	3,995

** Not Elsewhere Classified*
Source: IPHES.

The procedure codes used to define a SLNB are specified in Table A1 in Appendix A1. A SLNB was generally categorised into one of the groups shown in Table 1, based on the following information in the OPCS 4.6 Clinical Coding Instruction Manual:
"The use of a subsidiary code for sentinel lymph node (OPCS - O142) should also be recorded if the medical notes indicated that either sampling lymph node (OPCS4 - T86) or excision or biopsy of lymph node (OPCS4 - T87) had been done on the sentinel lymph node.
The biopsy of the lymph node NEC (OPCS4 -T911) should only be used when the exact site of the sentinel lymph node is not known". An admission that records a T86 and a T87 was recorded as "Other". This category also includes other SLNB procedure codes and other combinations of codes not reported in Table 1.

The number of recorded SLNB admissions increased by 31% in England over this five year period between 2005 and 2009 (740 vs. 962), while there were 3,995. However there was variation in the use of different procedure codes by different Trust and over time. The O142 code was not used until 2007, and the increase of use of this subsidiary code coincided with a decrease of use of T86 and T87 codes over time. The T911 code was not used until 2006, and there was a slight decrease in the number of admissions over time from 2007. It is not possible to determine whether this was a coding change over time or if T86 and T87 codes were actually used to record diagnostic removal of palpable nodes and that this declined as the number of SLNBs increased (see section 1.2 for more detail).

It is also important to note that it is possible that some Trusts may use additional codes to record SLNB than the ones used in this report, as well as others used in the private sector. Therefore the overall number of SLNB admissions may be under reported, more so for some Trusts than others.

1.2 Sampling of lymph node/ excision or biopsy of lymph node procedure codes

SLNB is carried out at the time of wide local excision for primary melanoma and would therefore normally take place within 62 days. In order to explore the possibility that the codes T86/T87 were in some instances used to record SLNB rather than removal of enlarged nodes, time from diagnosis to coding was investigated. The number of melanoma SLNB admissions (broken down by OPCS4 code) and time from diagnosis to SLNB admission, between 2005 and 2009 across England is shown in Table 2 below.

Table 2: Number of melanoma SLNB admissions by SLNB procedure code and time between diagnosis and admission dates, 2005-2009 admission years, England.

SLNB code (OPCS4)	O142 with T86 or T87		T86 or T87	
Time interval	Number	**%**	**Number**	**%**
0-31 days (up to 1 month)	124	15.5	349	20.2
32-62 days (between 1 and 2 months)	381	47.7	669	38.8
63-93 days (between 2 and 3 months)	221	27.7	292	16.9
94-124 days (between 3 and 4 months)	41	5.1	100	5.8
125-155 days (between 4 and 5 months)	10	1.3	39	2.3
156-186 days (between 5 and 6 months)	3	0.4	16	0.9
187 days and above (more than 6 months)	18	2.3	261	15.1
Total	798	100.0	1,726	100.0

Source: NCDR; IPHES

Note: Only SLNB admissions that occurred after diagnosis are considered here. Number of admissions reported is lower than that reported in table 1 due to the nature of patient matching between IPHES and NCDR.

If either a T86 or T87 code was accompanied with the subsidiary code for sentinel lymph node (O142 code) within the same admission, then this was regarded as a SLNB procedure, irrespective of the time frame. Furthermore, 63.3% and 91.0% of admissions were within 2 and 3 months of the diagnosis date respectively.
If there was no presence of the O142 code in the same admission as the T86 or T87 code, then 59.0% and 75.9% of admissions were within 2 and 3 months of the diagnosis date respectively. Only 15.1% of these admissions were more than 6 months after diagnosis, and this accounted for 6.5% of the overall total number of SLNB admissions. We therefore concluded that the vast majority of T86/T87 codes were within 6 months of diagnosis and were generally being used for SLNB. Therefore these codes were also used to define SLNB in the analysis.

The analysis suggested wide variation in the use of codes we have used to define SLNB (see Appendix 2), and that some Trusts may be using T86/T87 codes only to record SLNB.

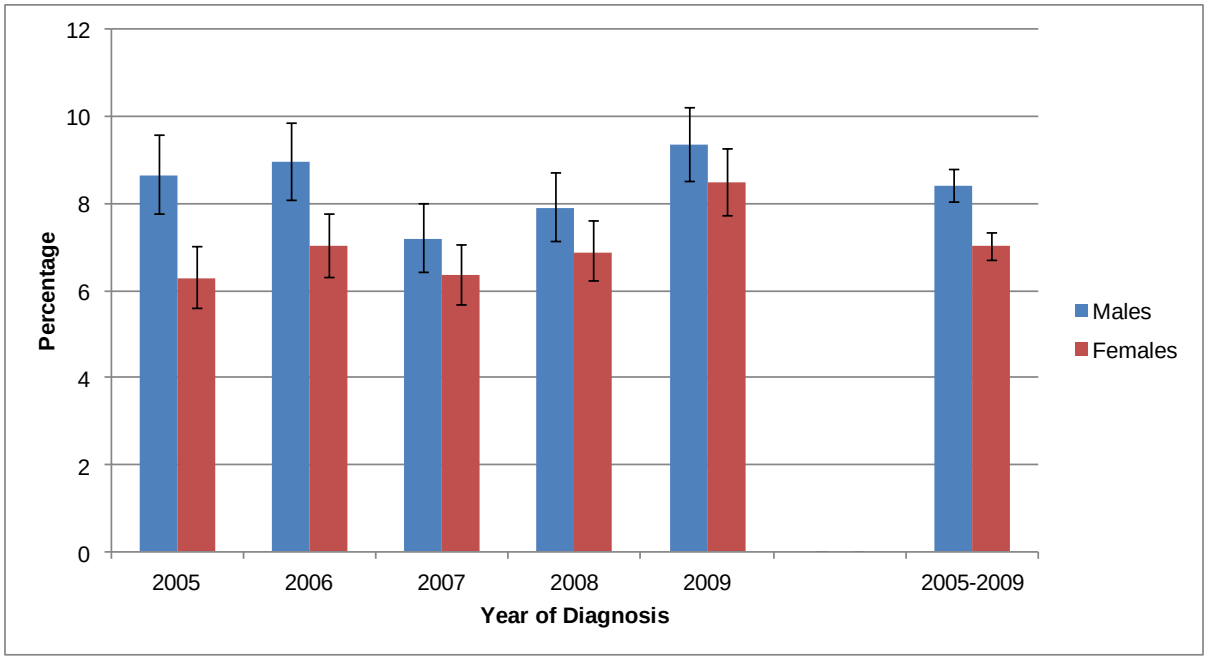
2. Cohort details

Less than 10% of melanoma cases overall were estimated to have had a SNLB in the period 2005-2009 in England.

2.1 Sex

2.1.1 Percentage of melanoma diagnosed in England by sex and diagnosis year receiving SLNB

***Figure 1: Percentage of melanoma cases receiving SLNB by sex and diagnosis year, 2005-2009*, England.**



Note: 95% confidence intervals are included.
Source: NCDR; IPHES.

There was a sex difference in proportion of cases that went on to have a SLNB and there were changes over time. The proportion of melanoma cases that received SLNB had significantly increased between 2005 and 2009 for females (6.3% vs. 8.5%, $p < 0.01$), and for males between 2007 and 2009 (7.2% vs. 9.3%, $p < 0.01$), see figure 1. The female rate was significantly lower than the male rate in 2005 and 2006 (both $p < 0.01$); however from 2007 onwards, the female rate was similar to the male rate.

The SLNB rate for males was significantly higher than that for females over this five year period (8.4% vs. 7.0%, $p < 0.01$). Some of the differences between the sexes are likely to reflect differences in stage at presentation between men and women. Older men for example tend to present with thicker primaries and in these data indeed the mean recorded Breslow thickness for males was higher than that for females (2.3 mm vs. 2.0 mm).

2.1.2 Age standardised rates of melanoma by sex

Table 3: Directly age-standardised melanoma incidence rates (ASR per 100,000) by sex, 2005-2009, England.

Sex	Count	ASR	LCI	UCI
Males	21,807	15.2	15.0	15.4
Females	24,548	15.9	15.7	16.1

Note: Rates are standardised to the standard European population age structure.95% confidence intervals are included.
Source: NCDR

The incidence of melanoma between 2005 and 2009 was significantly higher for females compared to males (15.9 vs. 15.2 per 100,000, $p < 0.01$), see Table 3. Therefore despite high female incidence rates, a greater proportion of males received SLNB than females, and this may be partly explained by males presenting with thicker tumours.

2.2 Age distribution

2.2.1. Distribution of SLNB by age group

Table 4: Number and distribution of melanoma cases receiving SLNB by age group, 2005-2009, England.

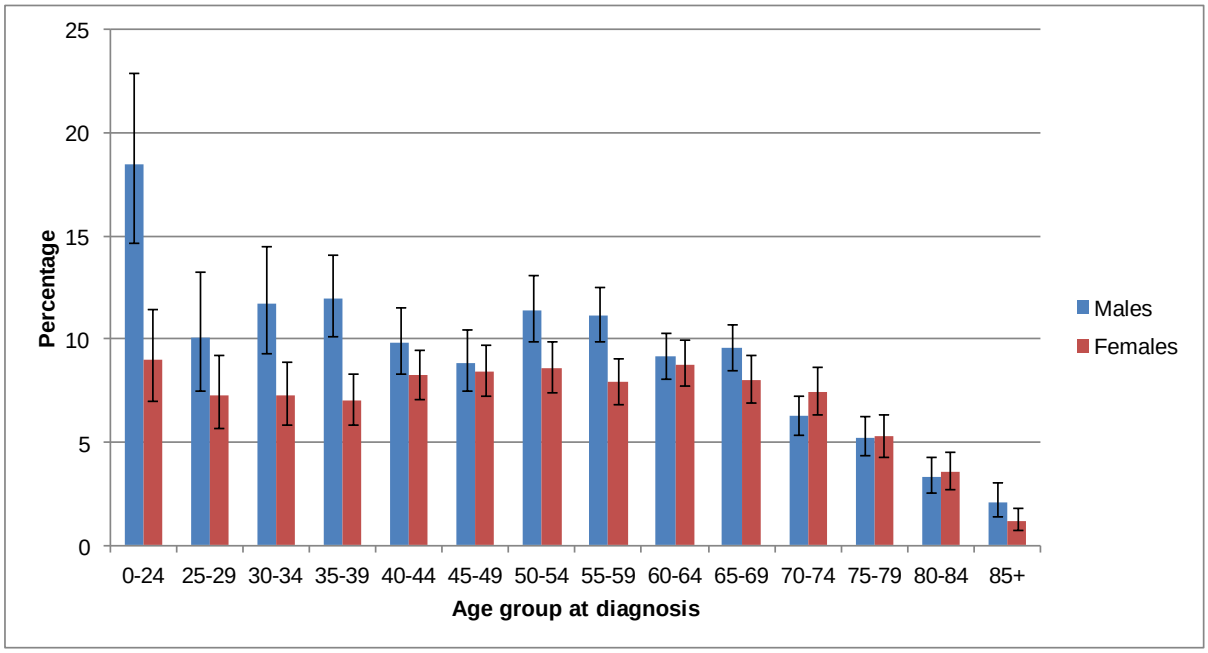
Sex	Males		Females	
Age group	**Number**	**%**	**Number**	**%**
0-24	69	3.4	65	3.4
25-29	56	2.7	76	3.9
30-34	81	3.9	94	4.9
35-39	143	6.9	131	6.8
40-44	147	7.1	182	9.4
45-49	144	7.0	170	8.8
50-54	195	9.5	192	9.9
55-59	261	12.7	194	10.0
60-64	281	13.6	248	12.8
65-69	268	13.0	193	10.0
70-74	176	8.5	162	8.4
75-79	136	6.6	111	5.7
80-84	63	3.1	78	4.0
85+	39	1.9	40	2.1
All Ages	2,059	100	1,936	100

Source: IPHES.

The majority of melanoma cases receiving SLNB was aged between 50-69 years, 50% for males and 43% for females, see Table 4. Only a small fraction of SLNB was carried out for patients aged 80 or over (5.5%).

2.2.2. Percentage of melanoma diagnosed in England by age group receiving SLNB

***Figure 2: Percentage of melanoma cases receiving SLNB by sex and age group, 2005-2009* diagnosis years combined, England.**



Note: 95% confidence intervals are included.
Source: NCDR; IPHES.

The proportion of melanoma cases that received SLNB in the 0-24 age group for males was significantly higher than females (18.4% vs. 9.0%, $p < 0.01$), and rates were more than double in males, see Figure 2.
The proportion of melanoma cases that received SLNB was lowest in the 80-84 and 85+ age groups for both sexes ($p< 0.01$).This might be explained by the view of clinicians and patients that a procedure requiring sentinel node biopsy which has staging but not survival value is less valuable to patients with increased frailness and co-morbidities. The procedure also represents more risk to those elderly patients as it requires a general anaesthetic and patients may therefore opt not to have a procedure in the absence of a survival benefit.

2.3 Breslow thickness

2.3.1. Distribution of Breslow thickness recorded for cases having received SLNB

The distribution of melanoma cases with a recorded Breslow thickness (this excludes cases without a recorded thickness) that received SLNB between 2005 and 2009 are reported in Table 5.

***Table 5: The number and distribution of melanoma cases receiving SLNB by sex and by recorded Breslow thickness tumour (millimetres), 2005-2009 diagnosis years combined, England*.**

	Males		Females		Persons	
Breslow thickness (mm)	**Number**	**%**	**Number**	**%**	**Number**	**%**
0 - 1	276	19.8	274	21.5	550	20.6
1.1 - 2	468	33.6	491	38.4	959	35.9
2.1 - 4	413	29.6	352	27.6	765	28.6
> 4	237	17.0	160	12.5	397	14.9
Total	1,394	100	1,277	100	2671	100

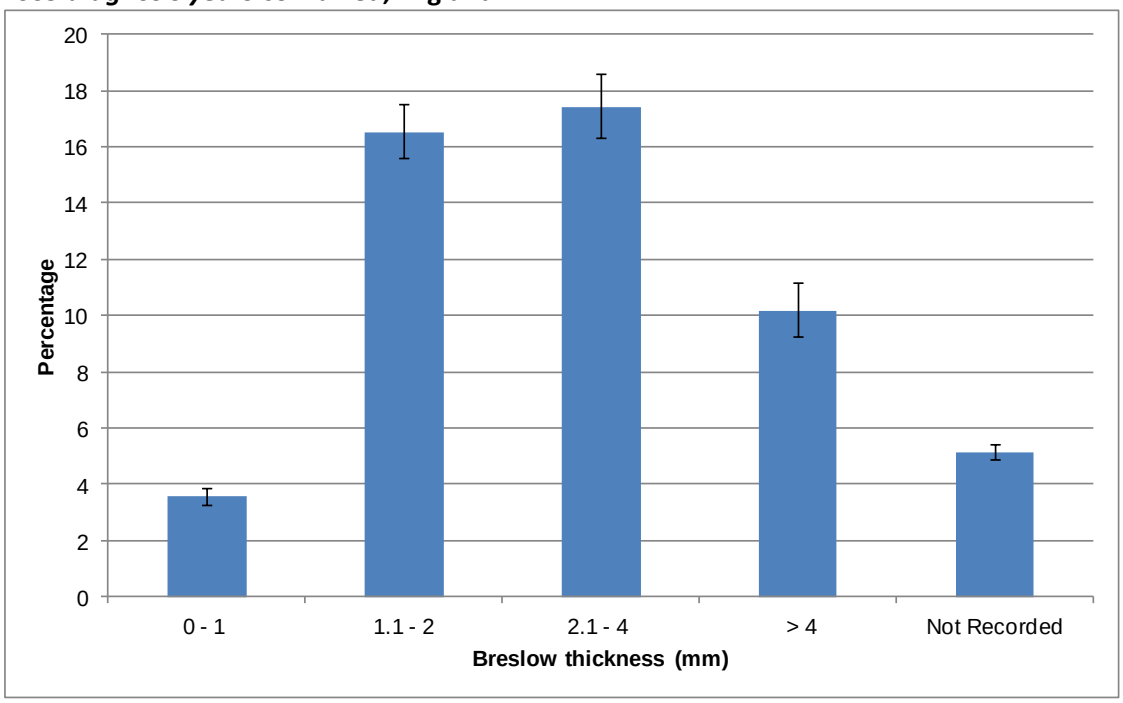
Source: NCDR; IPHES.

SLNB is usually not recommended under a tumour thickness of 1mm because of the low positive rate, but in these data, 21% of persons with thin tumours had a SLNB, which seems quite high. From the data available to date it is not possible to exclude the possibility that a proportion of these had symptomatic nodal masses. It is known moreover that some centres carried out SLNB in this time period in patients with thinner tumours if there were additional histological features such as the presence of regression in the primary or mitoses.

There was a higher percentage of males compared to females with a recorded Breslow thickness greater than 4mm that received SLNB (17% vs. 12.5%, $p < 0.01$).

2.3.2. Percentage of melanomas receiving SLNB in England by Breslow thickness group.

***Figure 3: The percentage of melanoma cases receiving SLNB by Breslow thickness group, 2005-2009 diagnosis years* combined, England.**



Note: 95% confidence intervals are included.
Source: NCDR; IPHES.

The highest proportion of melanoma cases in England that received SLNB were those in the 1.1-2mm (16.5%) and 2.1-4mm (17.4%) Breslow thickness groups, see Figure 3.

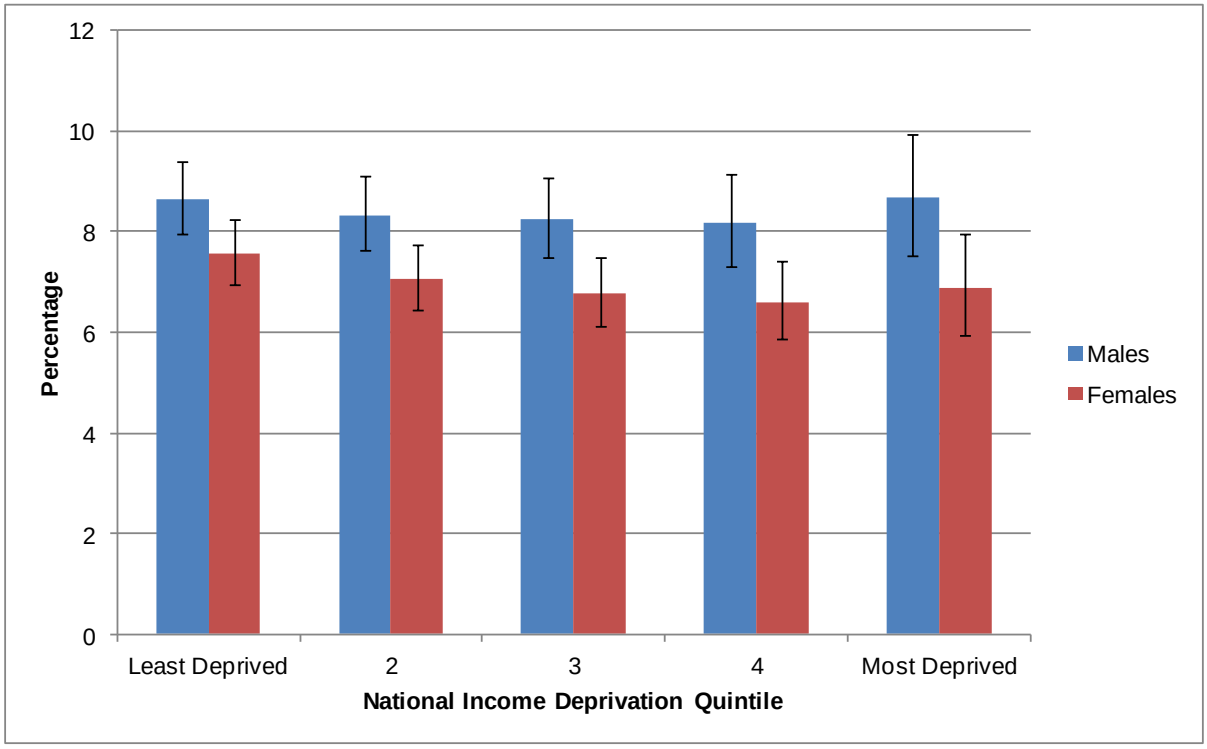
The SLNB rate for the 0-1mm Breslow thickness group was significantly the lowest (3.6%, $p < 0.01$), and this was expected since cases with a Breslow thickness of less than 1mm are unlikely to have positive sentinel nodes (Marsden et al 2010). A proportion of patients who do have SLNB with thin tumours were offered this procedure in the study period, probably because the tumour had a significant number of mitoses or were ulcerated (both poor prognostic features).

The SLNB rate for the greater than 4mm Breslow thickness group (10.2%) was significantly lower than those in the 1.1-2mm and 2.1-4mm groups ($p < 0.01$). It should be noted that thicker tumours are more common in the elderly who have a lower SLNB rate and this may account for some of this variation

2.4 Socio-economic deprivation

2.4.1. Proportion of melanoma diagnosed in England by National Income deprivation quintile receiving SLNB

***Figure 4: The proportion of melanoma cases receiving SLNB by sex and National Income Deprivation quintile, 2005-2009 diagnosis years* combined, England.**

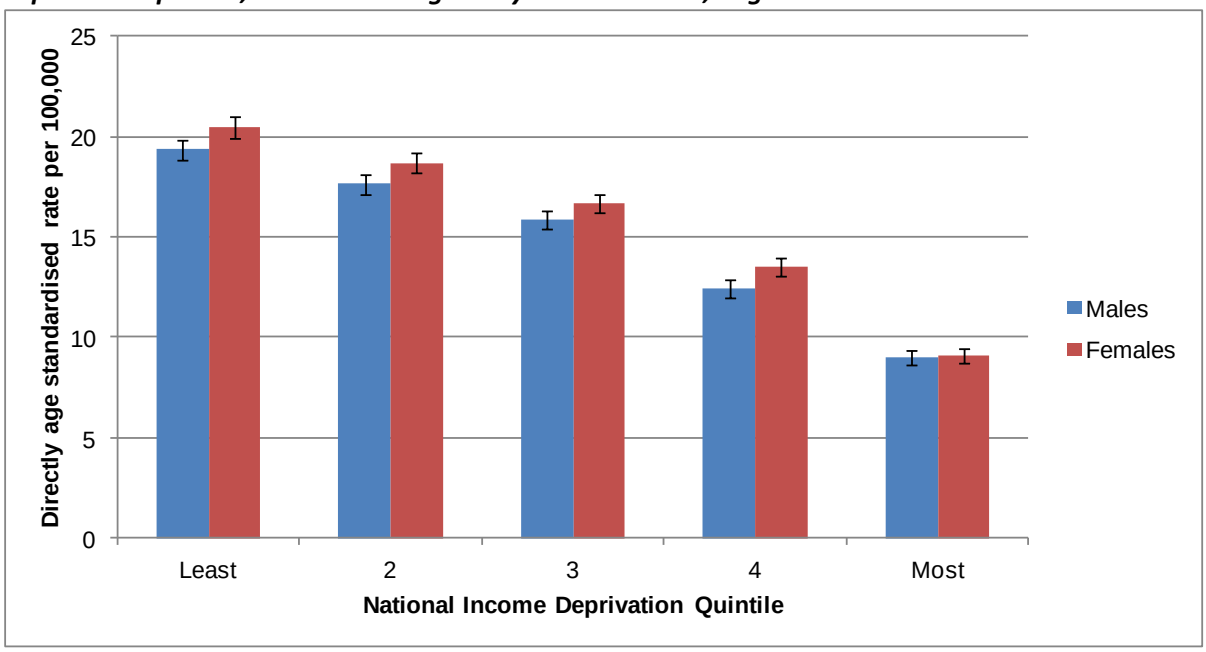


Note: 95% confidence intervals are included.
Source: NCDR; IPHES; Communities and Local Government.

There was no significant difference in the proportion of melanoma cases that received SLNB in the least deprived fifth population of England compared to the most deprived fifth population of England for both males (8.6% vs. 8.7%, p = 0.98) and females (7.6% vs. 6.9%, p =0.27), see Figure 4.

2.4.2 Age standardised rates of melanoma by National Income deprivation quintile

Figure 5: Directly age-standardised melanoma incidence rates by sex and National Income deprivation quintile, 2005-2009 diagnosis years combined, England.



Note: Directly age-standardised melanoma incidence rates were standardised to the standard European population age structure. 95% confidence intervals are included.
Source: NCDR; IPHES; Communities and Local Government.

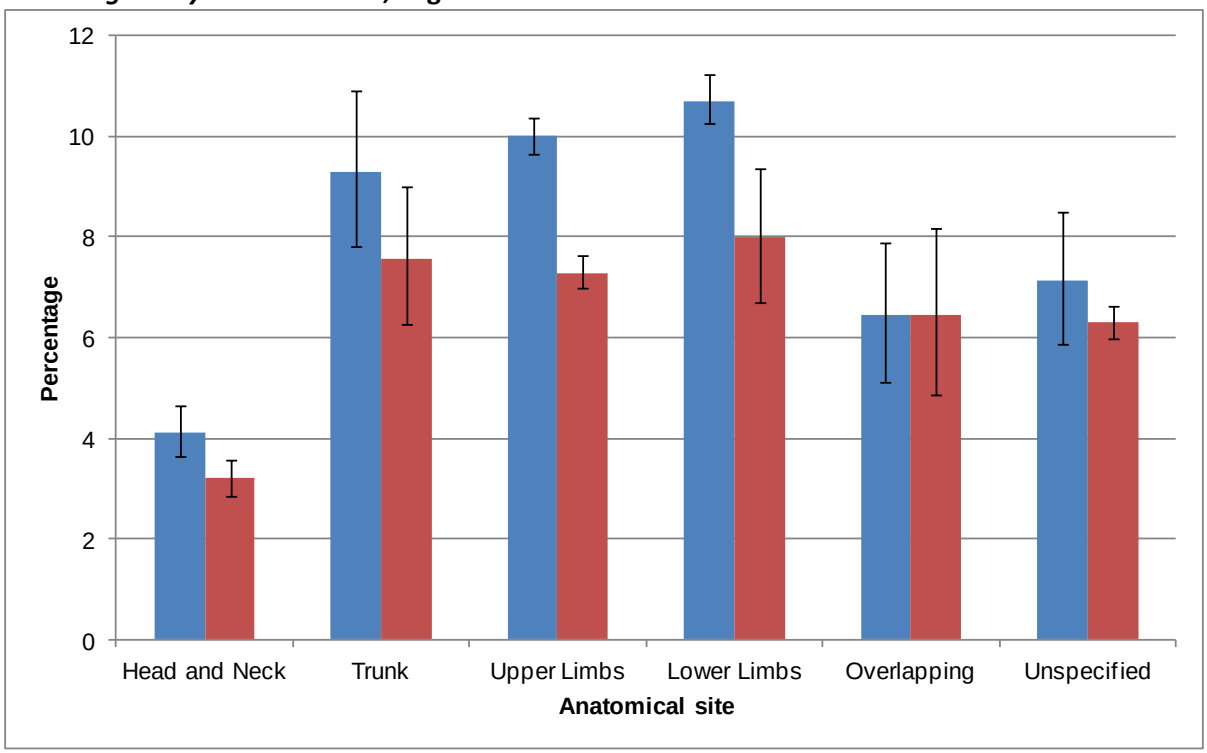
The incidence of melanoma between 2005 and 2009 in the least deprived group was significantly higher than the most deprived group for both males (19.3 vs. 9.0 per 100,000, $p < 0.01$) and for females (20.5 vs. 9.1 per 100,000, $p < 0.01$), see figure 5. This gradient has been observed previously.

Despite this, there was no socio-economic variation in the SLNB rates.

2.5 Anatomical sites

2.5.1 Proportion of melanoma diagnosed in England by anatomical site of the primary receiving SLNB

***Figure 6: The proportion of melanoma cases receiving SLNB by sex and by anatomical site, 2005-2009 diagnosis years* combined, England.**



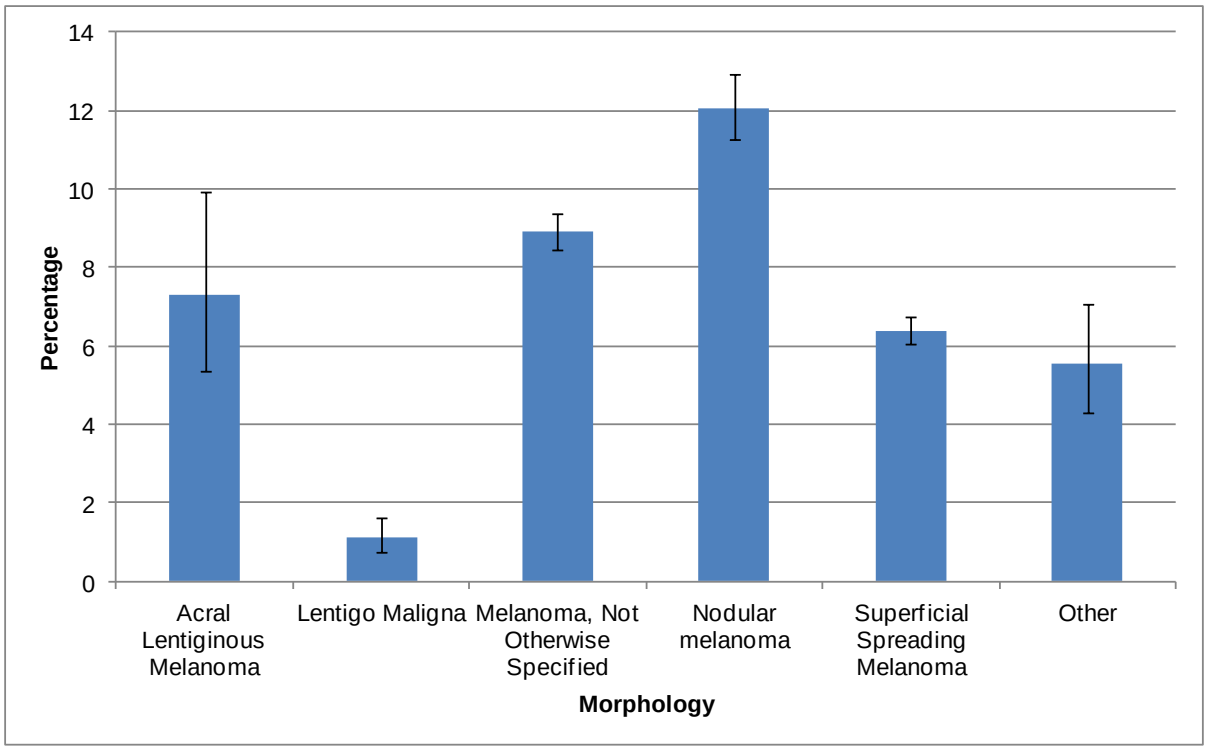
Note: 95% confidence intervals are included.
Source: NCDR; IPHES.

The lowest proportion of melanoma cases receiving SLNB was on the head and neck for both males (4.1%, $p < 0.01$) and females (3.2%, $p< 0.01$), see figure 6. The lower limbs represent the highest for males (10.7%) and females (8%), although this is not statistically significant (both $p > 0.05$). Multiple lymphatic drainage changes are more common for tumours on the head and neck; therefore some centres do not carry out SLNB in this group.

2.6 Morphology

2.6.1 Proportion of melanoma diagnosed in England by morphology group receiving SLNB

***Figure 7: The proportion of melanoma cases receiving SLNB by sex and by morphology group, 2005-2009 diagnosis years* combined, England.**



Note: 95% confidence intervals are included.
Source: NCDR; IPHES.

The significantly highest proportion of melanoma cases receiving SLNB was the nodular melanomas (12.1%, $p < 0.01$) and the lowest was the lentigo maligna melanoma (1.1%, $p < 0.01$), see Figure 7. Nodular melanoma is the most rapidly growing form of melanoma and therefore tends to be thicker. The mean recorded Breslow thickness for nodular melanoma (4.4 mm) was the highest across these groups, while it was the lowest for lentigo maligna melanoma (1.4 mm) and superficial spreading melanoma (1.3 mm) groups. Thickness may therefore explain most of the difference in SLNB carried out for morphological sub groups. Lentigo maligna melanoma is however also more frequent in the elderly and on the head and neck where lymphatic drainage makes SLNB more problematic and this was thought to contribute to these differences.

3. Cancer Networks and Trusts of treatment

3.1 Trust of treatment

The Trust recorded as having carried out the majority of SLNB between 2005 and 2009 was identified for each Cancer Network. The number of admissions for these trusts is presented in Table 6.

Table 6: Number of melanoma SLNB admissions by Cancer Network and Trust of Treatment, number of cases for Trust of treatment for 2005-2009 admission years combined, England.

Treatment Cancer Network (Number of Trusts)	Main Treatment Trust	Admission Year						Network Total
		2005	2006	2007	2008	2009	2005-2009	
Arden (3)	University Hospitals Coventry and Warwickshire NHS Trust	0	0	2	2	0	4	10
Sussex (3)	Queen Victoria Hospital NHS Foundation Trust	3	1		2	2	8	11
3 Counties (2)	Gloucestershire Hospitals NHS Foundation Trust	3	0	3	4	2	12	17
Mount Vernon (3)	East and North Hertfordshire NHS Trust	1	0	4	0	3	8	17
	Luton and Dunstable Hospital NHS Foundation Trust	1	3	1	1	2	8	17
West London (5)	The Royal Marsden NHS Foundation Trust	2	2	3	1	4	12	19
North Trent (4)	Sheffield Teaching Hospitals NHS Foundation Trust	2	2	4	2	4	14	23
Essex (4)	Mid Essex Hospital Services NHS Trust	0	2	4	7	3	16	25
Pan Birmingham (3)	University Hospitals Birmingham NHS Foundation Trust	3	4	3	4	7	21	25
Avon, Somerset and Wiltshire (6)	North Bristol NHS Trust	2	3	2	5	3	15	32
North of England (6)	South Tees Hospitals NHS Foundation Trust	1	3	3	2	2	11	36
	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	2	2	1	5	1	11	36
East Midlands (7)	University Hospitals of Leicester NHS Trust	2	2	6	4	2	16	44
Kent & Medway (4)	Medway NHS Foundation Trust	23	16	2	2	1	44	60
Lancashire and South Cumbria (4)	Lancashire Teaching Hospitals NHS Foundation Trust	2	3	5	2	38	50	64
Greater Midlands (5)	The Dudley Group of Hospitals NHS Foundation Trust	23	16	21	25	9	94	107
Dorset (3)	Poole Hospital NHS Foundation Trust	0	2	7	16	19	44	116
	The Royal Bournemouth and Christchurch Hospitals NHS Foundation Trust	10	14	11	12	20	67	116
North London (4)	Royal Free Hampstead NHS Trust	15	13	24	26	35	113	126
Anglia (8)	Norfolk and Norwich University Hospital NHS Trust	1	1	1	15	99	117	146
Surrey, West Sussex and Hampshire (4)	Frimley Park Hospital NHS Foundation Trust	14	13	15	12	21	75	151
	Royal Surrey County Hospital NHS Foundation Trust	10	15	10	16	19	70	151
Yorkshire (6)	Leeds Teaching Hospitals NHS Trust	3	19	25	55	55	157	176
Greater Manchester & Cheshire (8)	The Christie NHS Foundation Trust	7	32	46	44	49	178	192
South East London (2)	Guy's and St Thomas' NHS Foundation Trust	38	38	41	42	40	199	200
Central South Coast (4)	Portsmouth Hospitals NHS Trust	10	7	10	2	9	38	230
	Salisbury NHS Foundation Trust	4	12	4	8	15	43	230
	University Hospital Southampton NHS Foundation Trust	24	31	40	23	29	147	230
North East London (2)	Barts and The London NHS Trust	65	47	34	50	58	254	255
Merseyside & Cheshire (6)	St Helens and Knowsley Hospitals NHS Trust	36	33	38	69	67	243	260
Thames Valley (5)	Oxford Radcliffe Hospital NHS Trust	44	60	43	64	61	272	296
Peninsula (5)	Royal Devon and Exeter NHS Foundation Trust	53	73	48	59	65	298	355
Humber & Yorkshire Coast (2)	Hull and East Yorkshire Hospitals NHS Trust	59	98	59	69	83	368	370
South West London (3)	St George's Healthcare NHS Trust	195	145	108	94	74	616	618
England (145)		**740**	**782**	**698**	**813**	**962**	**3,995**	

Source: IPHES.

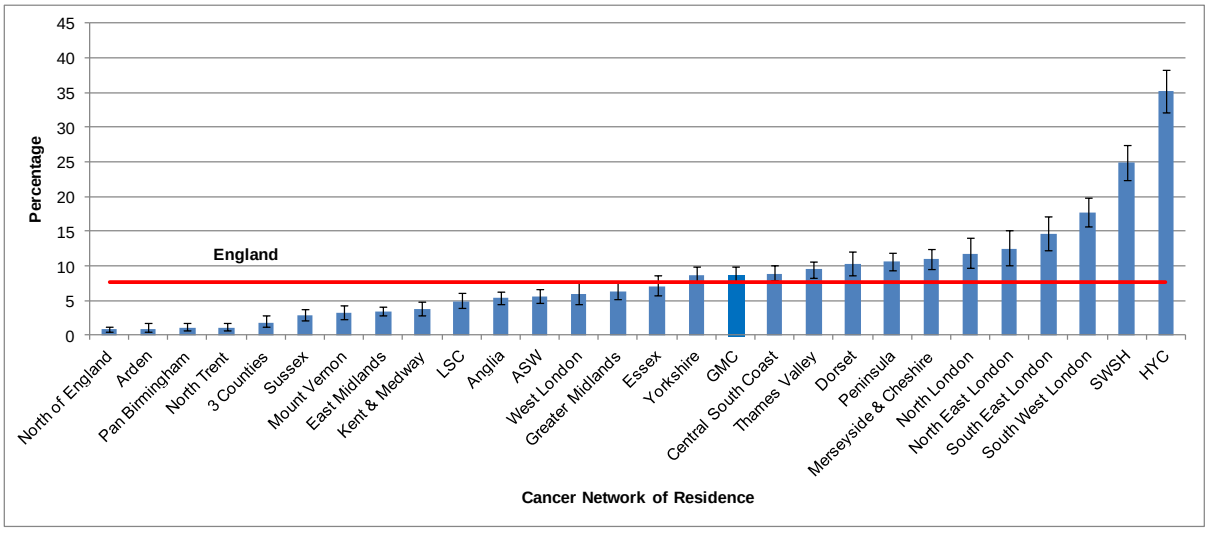
The number of recorded SLNB admissions increased by 31% in England between 2005 and 2009 (742 vs. 969). St George's Healthcare NHS Trust in South West London Cancer Network recorded as having a significant proportion of the SLNB admissions in England (15%). However the number of admissions recorded declined over time in this Trust, with less than half of admissions observed in 2009 compared to 2005 (74 vs. 195, -61%). Kent and Medway Cancer Network also observed a decrease in the number of admissions over time.

There was an increase in the number of admissions observed in England across Trusts as more Trusts carried out this procedure.

3.2 Cancer Network of treatment

The proportion of melanoma cases diagnosed between 2005 and 2009 receiving SLNB by Cancer Network of residence is shown in Figure 8.

***Figure 8: The proportion of melanoma cases receiving SLNB by Cancer Network of residence, 2005-2009 diagnosis years* combined, England.**



Note: 95% confidence intervals are included.
Key: ASW – Avon, Somerset and Wiltshire; LSC – Lancashire and South Cumbria; SWSH – Surrey, West Sussex and Hampshire; GMC – Greater Manchester and Cheshire; HYC – Humber and Yorkshire Coast.

Source: NCDR; IPHES.

At the time of data collection, significantly higher SLNB rates existed for South West London (17.7%), Surrey, West Sussex and Hampshire (24.8%) and Humber and Yorkshire Coast (35.2%) Cancer Network residents (all $p < 0.01$) compared to England residents overall (7.7%). These cancer Networks also showed a high number of admissions (table 6) and therefore SLNB rates from their residents were high.

Significantly lower SLNB rates existed for North of England (0.8%), Arden (0.8%) and Pan Birmingham (1.0%) Cancer Network residents (all $p < 0.01$) compared to England residents. These Networks did not carry out SLNB (see Table 6) and these patients were not referred elsewhere (see Table 7). There was therefore quite marked regional variation observed in SLNB across the country.

3.3 Cancer Network flow

Table 7 shows Trust admissions which included a SLNB broken down by Cancer Network of residence and Cancer Network of treatment between 2005 and 2009. Cancer Network residents were treated within their Networks providing that a local Trust was carrying out the procedure. However this was not possible for all Networks.

Table 7: Number of melanoma SLNB admissions by Cancer Network of residence and by Cancer Network of treatment, 2005-2009 admission years combined, England.

Cancer Network of Residence	Cancer Network of Treatment (admissions)	Total
3 Counties	3 Counties (16), Other (8)	24
Anglia	Anglia (142), Other (5)	147
Arden	Arden (10), Other (3)	13
ASW	Peninsula (71), ASW (29), Thames Valley (15), Central South Coast (13), Other (6)	134
Central South Coast	Central South Coast (207), South West London (23), Dorset (8), SWSH 8), Thames Valley (5), Other (5)	256
Dorset	Dorset (106), Central South Coast (8), Other (2)	116
East Midlands	East Midlands (43), North East London (27), Thames Valley (32), HYC (9), South West London (5), Other (6)	122
Essex	North East London (100), Essex (16), Other (7)	123
GMC	GMC (178), Merseyside & Cheshire (30), Other (5)	213
Greater Midlands	Greater Midlands (97), Pan Birmingham (7), Other (3)	107
HYC	HYC (333), Yorkshire (8)	341
Kent & Medway	Kent & Medway (60), South East London (10), Sussex (5), Other (7)	82
LSC	LSC (61), GMC (6), Other (3)	70
Merseyside & Cheshire	Merseyside & Cheshire (228), Other (1)	229
Mount Vernon	North London (22), Mount Vernon (15), Other (11)	48
North East London	North East London (100), Essex (5), Other (9)	114
North London	North London (89), North East London (23), South East London (5), Other (3)	120
North of England	North of England (36), Other (2)	38
North Trent	North Trent (22), Greater Manchester & Cheshire (5)	27
Pan Birmingham	Pan Birmingham (17), Greater Midlands (6), Other (1)	24
Peninsula	Peninsula (282), Other (1)	283
South East London	South East London (134), South West London (9), Other (3)	146
South West London	South West London (281), South East London (8), Other (5)	294
SWSH	South West London (240), SWSH (131), Other (3)	374
Sussex	South West London (35), Sussex (5), Other (13).	53
Thames Valley	Thames Valley (240), SWSH (5), Other (9)	254
West London	South East London (27), North London (9), South West London (8), West London (8), Other (9)	61
Yorkshire	Yorkshire (165), HYC (27), Other (2)	194

Key: ASW – Avon, Somerset and Wiltshire; LSC – Lancashire and South Cumbria; SWSH – Surrey, West Sussex and Hampshire; GMC – Greater Manchester and Cheshire; HYC – Humber and Yorkshire Coast.

Source: IPHES.

According to these 2005-09 data, the following Cancer Networks were recorded as having the majority of their residents being referred elsewhere for SLNB: Avon Somerset and Wiltshire, Essex, Mount Vernon, Surrey West Sussex and Hampshire, Sussex, and West London.

Discussion and key points

The number of SLNB admissions significantly increased over the period considered in this report with more Trusts starting to carry out the procedure to their patients. The centre at St Georges Trust were seen to have a reduction in procedures over time might suggest that there has been an increase in the number of melanoma cases receiving the procedure closer to home in recent years.

It is clear from this piece of work that there is currently a lack of standardised use of SLNB procedure codes in Trusts across England so that the data must be interpreted with caution. Although some of the codes adopted in this project are no longer used, we opted to keep them for the present analysis as it is likely that they have been replaced by more specific codes over the years. A degree of inconsistency in the recording of the OPCS4 codes at Trusts level might also have lead to underestimation of the workload.

Trusts such as Oxford Radcliffe NHS Hospital Trust and St George's Healthcare NHS Trust have a long history of undertaking SLNB. Oxford had no record of SLNB in 2005 and 2006 until sampling of lymph node (OPCS4 T86) were added to the definition of SLNB. St George's shows a marked decrease of cases which could be due to decrease in referrals due to the development of the procedure in other Trusts but it likely that other factors such as coding account for variation.

Overall these results reflect the eligibility of patients receiving SLNB and are in line with recommended criteria. The data we had access to however were only on procedures carried out. We were not able to assess what proportion of patients were offered the procedure and declined.

Patients with a recorded Breslow thickness of less than 1mm are less likely to be eligible for SLNB. Patients with a tumour thickness greater than 4mm thickness have been reported to be less likely to benefit from this procedure and we observed a lower proportion of patients proceeding to SLNB in these thinner and thicker tumours. In line with one of the criteria for SLNB, 64.5% of the SLNB were undertaken in patients with a Breslow thickness between 1mm to 4mm, of those with a recorded thickness.

The SLNB rate for the procedure declined rapidly for the 70 year old and over, with only a fraction of SLNB being taken up by patients aged 80 or over (5.5%). The increased frailness and co-morbidities associated with older patients and lack of evidence of a survival benefit from SLNB may explain some of this difference. SNLB is also used by many patients to better estimate their prognosis in order to decide whether to proceed to adjuvant therapy trials and in this time period such trials were less well tolerated by the elderly and this may also have contributed to the lower take up.

Based on these data, a number of key points can be made.

- There is a lack of standardised approach to the use of SLNB procedure codes in Trusts across England which must be remedied.

- There is a difference between males and female SLNB rates with more males receiving the procedure than females while the incidence of melanoma is higher in females. This could be linked with the type of tumour, thickness of tumour and stage of disease.

- A significant proportion of procedures were undertaken for nodular melanoma, the most aggressive type of melanoma. Not enough details such as ulceration of the tumour and other

eligibility factors were available to comment of the appropriateness of the other cases but this may also reflect thicker tumours in the nodular group.

- SLNB was undertaken more frequently for tumours of the lower limbs. This is expected in females as it is the most frequent anatomical site for melanoma but the most common site of disease for males is the trunk.

- There was no significant variation in the rates of SLNB across socio-economic groups, despite a higher incidence of melanoma in the least deprived areas of England

Appendix 1

SLNB procedure codes

Table A1: List of SLNB procedure codes used.

SLNB code	SLNB code description
O141	Pelvic lymph node
O142	Sentinel lymph node
O148	Specified other lymph node NEC
O149	Other lymph node NEC
T871	Excision or biopsy of scalene lymph node
T872	Excision or biopsy of cervical lymph node NEC
T873	Excision or biopsy of axillary lymph node
T876	Excision or biopsy of porta hepatis lymph node
T877	Excision or biopsy of inguinal lymph node
T878	Excision or biopsy of other specified lymph node
T879	Excision or biopsy of other unspecified
T861	Sampling of cervical lymph nodes
T862	Sampling of axillary lymph nodes
T863	Sampling of supraclavicular lymph nodes
T864	Sampling of internal mammary lymph nodes
T867	Sampling of inguinal lymph nodes
T868	Sampling of other specified nodes
T869	Sampling of unspecified nodes
T911	Biopsy of sentinel lymph node NEC

Source: OPCS4

Appendix 2

Trust of Treatment by SLNB code

Table A2: Number of melanoma SLNB admissions by main Trust of Treatment and by SLNB procedure code used, 2005-2009, England.

Treatment Cancer Network	Main Treatment Trust	SLNB code	Admission Year					
			2005	2006	2007	2008	2009	2005-2009
3 Counties	Gloucestershire Hospitals NHS Foundation Trust	T86/T87	3	0	3	4	2	12
Anglia	Norfolk And Norwich University Hospital NHS Trust	O142-T86/T87	0	0		11	72	83
		T86/T87	1	1	1	3	13	19
		T911	0	0	0	1	8	9
Arden	University Hospitals Coventry And Warwickshire NHS Trust	T86/T87	0	0	2	2	0	4
Avon, Somerset and Wiltshire	North Bristol NHS Trust	T86/T87	2	3	2	5	3	15
Central South Coast	Portsmouth Hospitals NHS Trust	O142-T86/T87	0	0	0	0	8	8
		T86/T87	8	6	3	2	1	20
		T911	0	1	7	0	0	8
	Salisbury NHS Foundation Trust	O142-T86/T87	0	0	0	4	10	14
		T86/T87	4	4	1	4	4	17
		T911	0	8	2	0	1	11
	University Hospital Southampton NHS Foundation Trust	O142-T86/T87	0	0	0	5	19	24
		T86/T87	24	19	5	6	6	60
		T911	0	12	35	11	3	61
Dorset	Poole Hospital NHS Foundation Trust	T86/T87	0	2	4	1	4	11
		T911	0	0	3	15	15	33
	The Royal Bournemouth And Christchurch Hospitals NHS Foundation Trust	T86/T87	10	14	10	6	1	41
		T911	0	0	1	6	19	26
East Midlands	University Hospitals Of Leicester NHS Trust	T86/T87	2	2	6	3	2	15
Essex	Mid Essex Hospital Services NHS Trust	T86/T87	0	2	4	7	3	16
Greater Manchester & Cheshire	The Christie NHS Foundation Trust	O142-T86/T87	0	0	2	27	35	64
		T86/T87	7	17	9	4	6	43
		T911	0	15	35	8	4	62
Greater Midlands	The Dudley Group Of Hospitals NHS Foundation Trust	O142-T86/T87	0	0	3	18	4	25
		T86/T87	23	11	9	6	4	53
		T911	0	5	9	1	1	16
Humber & Yorkshire Coast	Hull And East Yorkshire Hospitals NHS Trust	O142-T86/T87	0	0	10	56	60	126
		T86/T87	59	82	7	13	21	182
		T911	0	15	42	0	0	57
Kent & Medway	Medway NHS Foundation Trust	T86/T87	23	11	2	2	1	39
		T911	0	5	0	0	0	5
Lancashire and South Cumbria	Lancashire Teaching Hospitals NHS Foundation Trust	T86/T87	2	3	5	2	36	48
		T911	0	0	0	0	2	2
Merseyside & Cheshire	St Helens And Knowsley Hospitals NHS Trust	O142-T86/T87	0	0	4	48	52	104
		T86/T87	36	27	8	13	6	90
		T911	0	6	24	5	8	43
Mount Vernon	East And North Hertfordshire NHS Trust	T86/T87	1	0	4	0	3	8
	Luton And Dunstable Hospital NHS Foundation Trust	T86/T87	1	3	1	1	2	8
North East London	Barts And The London NHS Trust	O142-T86/T87	0	0	1	9	38	48
		T86/T87	65	17	11	8	3	104
		T911	0	28	22	33	17	100

Treatment Cancer Network	Main Treatment Trust	SLNB code	Admission Year					
			2005	2006	2007	2008	2009	2005-2009
North London	Royal Free Hampstead NHS Trust	O142-T86/T87	0	0	5	23	31	59
		T86/T87	15	5	4	2	2	28
		T911	0	8	15	1	2	26
North of England	South Tees Hospitals NHS Foundation Trust	T86/T87	1	3	3	2	1	10
		T911	0	0	0	0	1	1
	The Newcastle Upon Tyne Hospitals NHS Foundation Trust	T86/T87	2	2	1	5	1	11
North Trent	Sheffield Teaching Hospitals NHS Foundation Trust	T86/T87	2	2	4	2	4	14
Pan Birmingham	University Hospitals Birmingham NHS Foundation Trust	T86/T87	3	4	3	3	6	19
Peninsula	Royal Devon And Exeter NHS Foundation Trust	O142-T86/T87	0	0	0	30	51	81
		T86/T87	53	24	16	28	11	132
		T911	0	49	29	1	2	81
South East London	Guy's And St Thomas' NHS Foundation Trust	O142-T86/T87	0	0	0	1	3	4
		T86/T87	38	31	22	14	3	108
		T911	0	7	19	27	34	87
South West London	St George's Healthcare NHS Trust	O142-T86/T87	0	0	14	58	55	127
		T86/T87	195	63	14	14	9	295
		T911	0	80	77	22	8	187
Surrey, West Sussex and Hampshire	Frimley Park Hospital NHS Foundation Trust	O142-T86/T87	0	0	3	3	12	18
		T86/T87	14	8	4	4	0	30
		T911	0	5	8	5	9	27
	Royal Surrey County Hospital NHS Foundation Trust	O142-T86/T87	0	0	0	12	18	30
		T86/T87	10	10	5	4	0	29
		T911	0	5	5	0	1	11
Sussex	Queen Victoria Hospital NHS Foundation Trust	T86/T87	3	1	0	2	2	8
Thames Valley	Oxford Radcliffe Hospital NHS Trust	O142-T86/T87	0	0	7	6	16	29
		T86/T87	44	60	22	14	8	148
		T911	0	0	14	43	33	90
West London	The Royal Marsden NHS Foundation Trust	T86/T87	2	2	3	1	3	11
Yorkshire	Leeds Teaching Hospitals NHS Trust	O142-T86/T87	0	0	6	6	4	16
		T86/T87	3	19	10	9	18	59
		T911	0	0	9	37	33	79

Source: IPHES.

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The 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.

Sitting within the National Cancer Research Institute (NCRI), the NCIN works closely with cancer services in England, Scotland, Wales and Northern Ireland. In England, the NCIN is part of the National Cancer Programme.

Our aims and objectives cover five core areas to improve the quality and availability of cancer data from its collection to use:

- **Promoting efficient and effective data collection throughout the cancer journey**
- **Providing a common national repository for cancer datasets**
- **Producing expert analyses, to monitor patterns of cancer care**
- **Exploiting information to drive improvements in cancer care and clinical outcomes**
- **Enabling use of cancer information to support audit and research programmes**