

# Major surgical resections in England: head and neck cancers

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## Executive summary

The percentage of patients treated within NHS hospitals in England with a record of major surgical resection varied depending on the head and neck cancer anatomic site. Oral cavity cancer with 71.4% had the highest percentage of major surgical resections, whereas hypopharynx cancer with 42.1% showed the lowest proportion. For all head and neck cancers examined in this report, the percentage of major surgical resections was significantly lower for males (46.7%) than for females (51.7%). However, the sex differences by various head and neck cancer sites were not statistically significant.

The analysis showed that for older age groups there was a clear, decreasing trend in the proportion of patients undergoing a major surgical resection. For patients aged 80 years or over, lowest percentages were recorded for all cancer sites. These proportions were generally significantly lower than all other age groups. Patients 80 or over diagnosed with oropharynx cancer, were least likely to be treated with major surgical resection (17.9%). For the same cancer site, 51.4% of patients under 40 had a major surgical resection record. The smallest gap between the age bands was noted for larynx cancers where 37.7% of patients aged 80 or over, and 55.9% under 40, had a major surgical resection. For other cancer sites the proportion for patients aged 80 or over decreased from: 50.0% for patients aged 40-49 to 29.1% for hypopharynx cancers; 78.3% for patients under 40 to 56.1% for oral cavity cancers; and 70.0% to 45.1% for major salivary gland cancers.

The analysis of the proportion of patients with a record of major surgical resection by socio-economic deprivation revealed that there was some evidence of significant differences between quintiles. However, where statistical significance was achieved, the difference was relatively small. For all head and neck cancers analysed here, the percentage of major surgical resections decreased for more deprived groups with a gap of 2.2% per quintiles for females; the difference for males was not statistically significant. The proportion of patients diagnosed with oral cavity cancer decreased per deprivation quintiles by 1.8% for males and 1.2% for females. Statistically significant difference was also recorded for males with larynx cancer. However, the percentage of major surgical resections increased for more deprived groups by 1.8% per quintile. Because, the analysis by deprivation quintile did not adjust for age or case-mix factors, it is not possible to conclude whether the observed variation is fully related to deprivation and further work is required. On the other hand, as data on patients treated in private setting is not available some underestimation of the deprivation gap is likely due to private surgery being most frequent in the more affluent groups.

Variations in major surgical rates were also observed between Cancer Networks. The number of Cancer Networks that fell outside the confidence limits of expected variation was generally higher for age standardised ratios than for unadjusted proportions of patients with major surgical resection record. This suggests that differences exist between areas of residence which cannot be solely explained by different age structure of the population and an additional examination of this geographical variation is needed.

Although this report highlights that differences in the percentage of patients with a head and neck cancer diagnoses undergoing major surgical resections exist by sex, age, deprivation and Cancer Network, caution should be taken when interpreting the results. Since other factors such as stage of disease and co-morbidities were not accounted for, to allow for a better understanding of the clinical significance of the findings, more work is necessary. Furthermore, it is known that the complexity of head and neck cancer surgery is not always well reflected using the current OPCS4 codes in HES and it is possible that some systematic differences occur in the way trusts code their procedures.

## 1. Introduction

The disease burden of head and neck cancer is significant. Patients often require intensive multi-modality treatments and rehabilitation with long-term support to achieve an adequate recovery<sup>1</sup>. The care pathway for head and neck cancer is complex. The concentration of special senses in the head and neck means that even minor changes in tissues can have a profound impact upon an individual's quality of life, as organs essential for normal human activities like breathing, speaking, eating and drinking are often permanently affected. Either surgery or radiotherapy may be appropriate as primary treatment for head and neck cancers; some patients will require both<sup>2</sup>. The type of primary treatment will differ depending on the site of head and neck cancer and other factors, such as staging and co-morbidity, can have a significant effect upon treatment outcomes. Changes or variations in clinical practice might also be of relevance. For example, for oropharynx cancer there is a recent rising trend for instigating non surgical management of this type of disease, but opinion is divided on the increased toxicity associated with non surgical treatment<sup>1</sup>. Therefore, a better understanding of any existing variations in treatment provision would be valuable.

A recent report published by the National Cancer Intelligence Network (NCIN)<sup>3</sup> has revealed that for the cancer sites examined (oesophagus; stomach; liver; pancreas; colorectal; trachea, bronchus and lung; breast; cervix; uterus; ovary; prostate; kidney; and bladder) a decreasing trend in the proportion of major surgical resections was recorded for older patients. The report has also highlighted a small, but significant, decrease in the percentage of patients receiving major surgical resection in more deprived groups and variations in surgical rates between Cancer Networks. Building on the above findings, our report examines whether differences in major surgical resections by sex, age and socio-economic deprivation also exist for head and neck cancers. It also considers variations in geographical patterns, by looking at major surgical resection rates for Cancer Networks based on patients' postcode of residence.

This report makes use of three separate data sources:

1. National cancer registry data for cancer registrations in England for the period 1<sup>st</sup> January 2004 to 31<sup>st</sup> December 2008.
2. Inpatient Hospital Episodes Statistics (HES) data for England for the period 2003 to 2009.
3. National Head and Neck Cancer Audit (DAHNO) data for the period 1<sup>st</sup> January 2004 to 31<sup>st</sup> December 2008.

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<sup>1</sup>The Information Centre (IC) for Health and Social Care. National Head & Neck Cancer Audit 2010 (Amended). 2011.

[http://www.ic.nhs.uk/webfiles/Services/NCASP/audits%20and%20reports/Head\\_and\\_Neck\\_Cancer\\_Audit\\_2010/NHS\\_Head\\_Neck\\_Cancer\\_Audit\\_Interactive\\_29.6.11.pdf](http://www.ic.nhs.uk/webfiles/Services/NCASP/audits%20and%20reports/Head_and_Neck_Cancer_Audit_2010/NHS_Head_Neck_Cancer_Audit_Interactive_29.6.11.pdf)

<sup>2</sup>National Institute for Clinical Excellence. Guidance on Cancer Services – Improving Outcomes in Head and Neck Cancers – The Manual. 2004. <http://guidance.nice.org.uk/CSGHN>

<sup>3</sup>National Cancer Intelligence Network. Major surgical resections England, 2004-2006. 2011. <http://www.ncin.org.uk/publications/reports/default.aspx>

## 2. Methods

This section outlines the methodological approach used in the analysis of major surgical resections for head and neck cancers in England. It was largely based on the report previously published by the NCIN<sup>3</sup>, which did not cover head and neck cancers. It is known that the complexity of head and neck cancer surgery is not always well reflected using the current OPCS4 codes and therefore may be under-reported in both the National Cancer Data Repository (NCDR) and Hospital Episode Statistics . Consequently, in addition to the above data sources, as a first step this analysis used the National Head and Neck Cancer Audit data to compare the completeness of recording of major surgical resections in DAHNO and HES. DAHNO has a bespoke coding system that facilitates the recording of procedures' combinations and is thought to more accurately reflect the complexity of head and neck cancer surgery. In utilising DAHNO data it is recognised that data quality improved significantly from inception to the end of the period studied in 2008. Furthermore, the recording of the multiple surgical procedure data items was not always complete leading to a situation where a major surgical resection was carried out but only the first procedure (e.g. temporary tracheostomy) was recorded.

### 2.1 Comparison of major surgical resections recording between DAHNO and HES

Head and neck cancer diagnoses in England (see [Appendix 1](#)), for the period 1<sup>st</sup> January 2004 to 31<sup>st</sup> December 2008, were extracted from DAHNO for patients that had a record of major surgical resection. Major surgical resections were classified as non-diagnostic surgical operations which were carried out with the intent to remove the tumour and are appended to the report (see [Appendix 2](#)). Patients with more than one record of major surgical resection for their treatment were included once in the data extract. Nasopharynx cancers were not included in the analysis as only a small proportion were expected to be treated by major surgical resection. The DAHNO extract formed the basis for linkage with HES in order to identify whether these patients also had major surgical resection records on HES. This comparison analysis was not looking for an exact match of coding but rather examined how well major surgical resections for head and neck cancers were identified in both data sources. A timeframe of 30 days before and up to six months post the diagnosis date was included in order to restrict the surgery to the relevant cancer diagnosis and to avoid recurrences.

**Table 2.1** Completeness of recording of major surgical resections in DAHNO and HES by cancer site

	Diagnoses on DAHNO (2004-2008)	Surgery on DAHNO (% of DAHNO diagnoses)	MSR‡ on DAHNO (% of DAHNO surgeries)	HES linked records with MSR (% of DAHNO MSR)
ORAL CAVITY	3,822	2,065 (54.0%)	1,319 (63.9%)	1,202 (91.1%)
OROPHARYNX	1,772	506 (28.6%)	298 (58.9%)	241 (80.9%)
HYPOPHARYNX	460	100 (21.7%)	55 (55%)	42 (76.4%)
LARYNX	3,858	1,047 (27.1%)	717 (68.5%)	600 (83.7%)
MAJOR SALIVARY GLAND*	419	183 (43.7%)	122 (66.7%)	95 (77.9%)
<b>ALL HEAD AND NECK CANCERS</b>	<b>10,331</b>	<b>3,901 (37.8%)</b>	<b>2,511 (64.4%)</b>	<b>2,180 (86.8%)</b>

‡ MSR - Major Surgical Resections; \* Major salivary gland was not consistently recorded throughout the study period with majority of the cases (277) reported in 2008

For the above period, 10,331 of relevant head and neck cancer diagnoses were identified in the DAHNO dataset. Out of the 10,331 diagnoses, 3,901 (37.8%) patients had a surgery record with 2,511 (24.3% of all diagnoses and 64.4% of all surgeries) being a major surgical resection. Out of the 2,511 patients with major surgical resection record on DAHNO, for 2,180 patients (86.8%) a major surgical resection record was also identified in HES. The level of completeness for recording of major

surgical resections in DAHNO and HES varied by cancer site (Table 2.1) with the highest percentage observed for oral cavity cancer (91.1%) and lowest for hypopharynx (76.4%).

## 2.2 National Cancer Data Repository: data extraction and linkage

Although case ascertainment on DAHNO continues to improve (95.7% for the period from 1<sup>st</sup> November 2009 to 31<sup>st</sup> October 2010), earlier data sets are less complete (for example, for the period 1<sup>st</sup> November 2008 to 31<sup>st</sup> October 2009 89% and between 1<sup>st</sup> November 2007 to 31<sup>st</sup> October 2008 64%). Furthermore, DAHNO did not cover all head and neck cancer sites from the beginning of data collection in 2004. Larynx and oral cavity cancers data is available for all years and oropharynx, hypopharynx and nasopharynx mainly from October 2007 (but some in earlier years). Formal national collection on pharynx and major salivary gland cancer began in 2008. Therefore, in order to allow for a capture of all recorded head and neck cancer diagnoses in England, the use of the NCDR for this analysis was preferred.

Patients diagnosed with head and neck cancer, between 1<sup>st</sup> January 2004 and 31<sup>st</sup> December 2008, were extracted from NCDR and were linked to HES. Head and neck cancers were identified according to DAHNO ICD-10 coding and grouping criteria (see [Appendix 1](#)). As discussed above, nasopharynx cancers were not included in the analysis. Patients diagnosed with head and neck cancers identified using the above definitions that were included in the analysis are, therefore, referred to as *all head and neck cancers* throughout the report.

All linked HES records from 2003 to 2009 were extracted for the head and neck cancer patients identified above. Patients who could not be matched to at least one hospital episode were excluded from the analysis; this formed the basis for the denominator for all analyses. As stated above, patients with more than one record of major surgical resection were included in the analysis once and the same timeframe between treatment and diagnosis dates was incorporated. The following records were excluded from all analyses:

- any registrations based on Death Certificate Only;
- if the postcode did not agree with supplying registry in data source (cases when flag “Y” only include); and
- any cases with missing information on date of diagnosis, place of residence, sex or age.

**Table 2.2** Percentage of cancer registrations linked to HES records by cancer site – patients diagnosed between 2004 and 2008 with HES up to 2009

	Number of patients	Number of patients linked to HES	% of patients linked to HES
ORAL CAVITY	5,048	4,651	92.1%
OROPHARYNX	6,801	6,442	94.7%
HYPOPHARYNX	1,789	1,736	97.0%
LARYNX	8,653	7,869	90.9%
MAJOR SALIVARY GLAND	2,308	1,935	83.8%
<b>ALL HEAD AND NECK CANCERS</b>	<b>24,599</b>	<b>22,633</b>	<b>92.0%</b>

For the period 1<sup>st</sup> January 2004 to 31<sup>st</sup> December 2008, 24,599 patients were identified with a cancer of oral cavity, oropharynx, hypopharynx, larynx or major salivary gland; 22,633 patients (92.0%) were linked to at least one HES record. The percentage of HES-linked records varied by cancer site (83.8% to 97.0% – see Table 2.2) and by Cancer Network (71.4% to 100% depending on cancer site – see [Appendix 3](#)).

## 2.3 Data analysis

The percentage of head and neck cancer patients with a record of a major surgical resection was analysed by:

- sex,
- age,
- deprivation quintile (based on IMD 2010 and postcode of residence), and
- Cancer Network.

For Cancer Networks, findings are also reported as indirectly age-standardised ratios with England figures used as expected values.

To examine the trend across percentages of patients receiving major surgical resection by deprivation quintile, weighted ordinary least squares linear regression was used. This approach was selected due to different variability across the deprivation groups and, therefore, differences in the standard deviation and the variance between the quintiles. The weight used for the regression analysis was the corresponding number of HES linked patients by cancer site for each quintile. Trend was considered as statistically significant when the p-value (level of significance) was 0.05 (5%) or lower; a lower p-value indicates higher level of significance.

Staging of cancer is an important predictor of survival and cancer treatment is primarily determined by the stage of the disease. Recording of stage is generally poor on NCDR with wide variations between cancer registries<sup>4</sup>. Stage information, however, continues to improve on DAHNO and for the audit period November 2009 to October 2010 78% of DAHNO registered cases in England had T and N category recorded<sup>1</sup>. This improvement was partly offset by increased use of Tx and Nx and for previous DAHNO years stage recording was less complete. As explained previously, not all head and neck cancer anatomic sites were recorded at the inception of DAHNO. Although now all Cancer Networks in England and Wales submit data to the audit, not all eligible networks and trusts participated in the timeframe studied. Consequently, for the period 1<sup>st</sup> January 2004 to 31<sup>st</sup> December 2008, 10,331 head and neck cancer diagnoses were recorded on DAHNO whereas 24,599 new registrations were identified through the NCDR. This resulted in a low proportion of the cancer registrations linked to HES with stage recorded (Table 2.3). Also, as not all head and neck cancer sites were part of the DAHNO collection from 2004, the case ascertainment coverage over the study period is not systematic. Therefore, for this study cohort the percentage of head and neck cancer patients with a record of a major surgical resection by stage was not analysed.

**Table 2.3** Percentage of cancer registrations linked to HES with stage at diagnosis identified on DAHNO – patients diagnosed between 2004 and 2008 with HES up to 2009

	Early <sup>†</sup>	Late <sup>††</sup>	Staged with TX or NX
ORAL CAVITY	14.3%	12.6%	2.8%
OROPHARYNX	3.1%	12.6%	2.1%
HYPOPHARYNX	2.7%	13.7%	1.9%
LARYNX	14.6%	10.9%	3.6%
MAJOR SALIVARY GLAND	2.7%	3.3%	1.8%
<b>ALL HEAD AND NECK CANCERS</b>	<b>9.3%</b>	<b>11.3%</b>	<b>2.7%</b>

<sup>†</sup>Early – T1 or T2 with N0; <sup>††</sup>Late – T1 or T2 with N+ OR T3 or T4 with N0 or N+

<sup>4</sup> Oxford Cancer Intelligence Unit. Head and Neck Cancers. Data quality and completeness in the National Cancer Data Repository: 2008 registrations. 2011. <http://www.ociu.nhs.uk/cancer-intelligence-function/information-service-1/other-information>



### 3. Results

This section presents the results of the analysis examining differences in the proportion of patients with head and neck cancer diagnoses treated with a major surgical resection in NHS hospitals in England by sex, age, deprivation quintile and Cancer Network. Caution should be taken when interpreting the results as the complexity of head and neck cancer surgery is not always well reflected by the current OPCS4 codes and therefore may be under-reported by HES. As presented in Table 2.1 completeness of recording of major surgical resections in DAHNO and HES varied by anatomic cancer site between 76.4% and 91.1% for the study period. Additionally, the treatment of private patients outside of NHS hospitals is not captured here. The percentage of major surgical resections by deprivation quintiles have not been adjusted for differences in the age structure. Differences by Cancer Network should also be treated with caution as a variety of factors might influence the findings, including the possibility of variability in submission of surgical data and coding quality for different anatomic sites in HES, higher rates of private patients (influencing case volume), later stage of disease at diagnosis and co-morbidities. Cancer Networks with relatively small numbers of patients for some of the cancer anatomic sites might be particularly affected by the above factors.

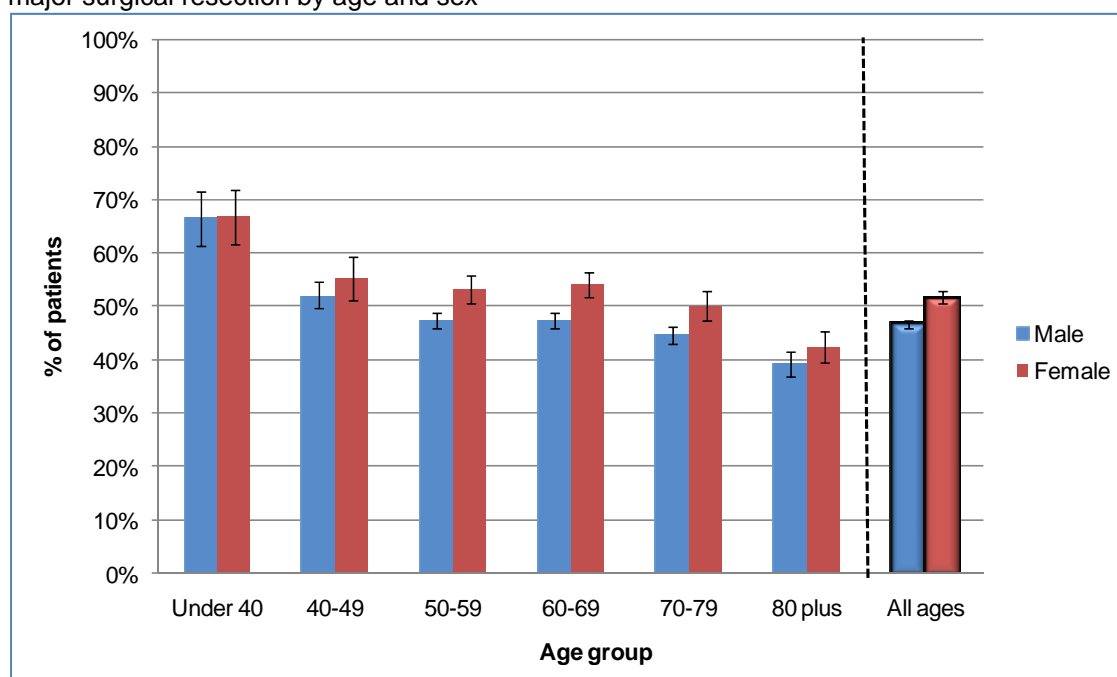
#### 3.1 All head and neck cancers

**Table 3.1.1** All head and neck cancers – major surgical resections by age and sex

Age group	Male			Female			Persons		
	HES linked patients	% MSR <sup>‡</sup>	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
< 40	335	66.6%	61.4% - 71.4%	317	66.9%	61.5% - 71.8%	652	66.7%	63.0% - 70.2%
40-49	1,566	52.2%	49.7% - 54.6%	580	55.2%	51.1% - 59.2%	2,146	53.0%	50.9% - 55.1%
50-59	4,150	47.4%	45.9% - 48.9%	1,346	53.2%	50.5% - 55.8%	5,496	48.8%	47.5% - 50.1%
60-69	4,979	47.4%	46.0% - 48.8%	1,586	54.1%	51.6% - 56.5%	6,565	49.0%	47.8% - 50.2%
70-79	3,482	44.7%	43.0% - 46.3%	1,346	50.1%	47.5% - 52.8%	4,828	46.2%	44.8% - 47.6%
≥ 80	1,830	39.2%	37.0% - 41.4%	1,116	42.5%	39.6% - 45.4%	2,946	40.4%	38.7% - 42.2%
<b>All ages</b>	<b>16,342</b>	<b>46.7%</b>	<b>46.0% - 47.5%</b>	<b>6,291</b>	<b>51.7%</b>	<b>50.5% - 53.0%</b>	<b>22,633</b>	<b>48.1%</b>	<b>47.5% - 48.8%</b>

<sup>‡</sup> MSR - Major Surgical Resections

**Figure 3.1.1** All head and neck cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by age and sex

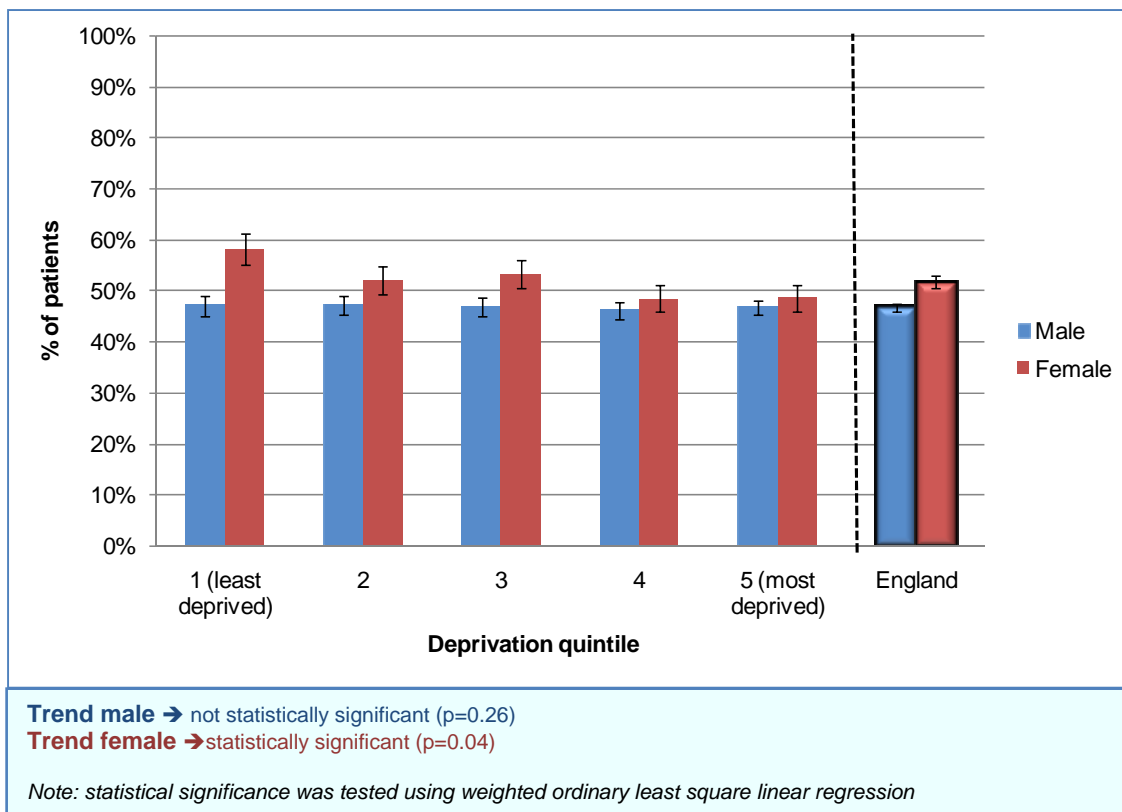


**Table 3.1.2** All head and neck cancers – major surgical resections by deprivation quintile and sex

Deprivation Quintile*	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
1	2,425	47.1%	45.1% - 49.1%	1,020	58.2%	55.2% - 61.2%	3,445	50.4%	48.7% - 52.1%
2	2,831	47.2%	45.4% - 49.1%	1,238	52.0%	49.2% - 54.8%	4,069	48.7%	47.2% - 50.2%
3	3,132	46.8%	45.1% - 48.6%	1,274	53.3%	50.6% - 56.0%	4,406	48.7%	47.2% - 50.2%
4	3,490	46.1%	44.4% - 47.7%	1,310	48.5%	45.8% - 51.2%	4,800	46.7%	45.3% - 48.1%
5	4,464	46.7%	45.2% - 48.2%	1,449	48.5%	46.0% - 51.1%	5,913	47.2%	45.9% - 48.4%
<b>England</b>	<b>16,342</b>	<b>46.7%</b>	<b>46.0% - 47.5%</b>	<b>6,291</b>	<b>51.7%</b>	<b>50.5% - 53.0%</b>	<b>22,633</b>	<b>48.1%</b>	<b>47.5% - 48.8%</b>

\* where Quintile 1 is least deprived and Quintile 5 is most deprived; ‡ MSR - Major Surgical Resections

**Figure 3.1.2** All head and neck cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by deprivation quintile and sex



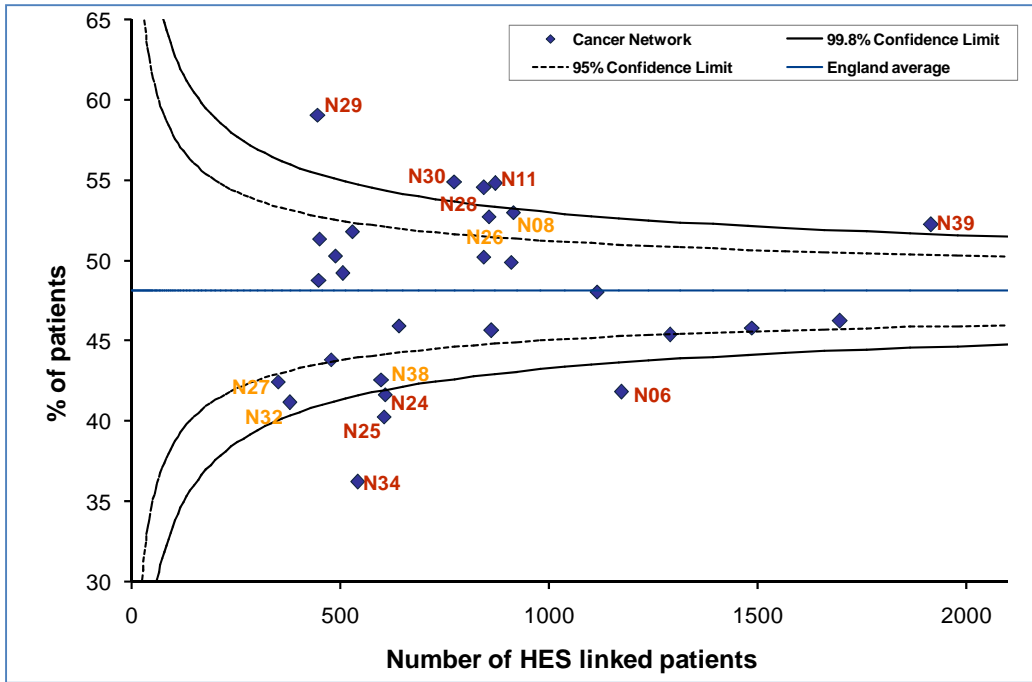
**Table 3.1.3** All head and neck cancers – major surgical resections by Cancer Network and sex

Cancer Network	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
N01 Lancashire and South Cumbria	630	47.5%	43.6% - 51.4%	233	40.8%	34.7% - 47.2%	863	45.7%	42.4% - 49.0%
N02 Greater Manchester and Cheshire	1,086	43.8%	40.9% - 46.8%	401	51.1%	46.2% - 56.0%	1,487	45.8%	43.3% - 48.3%
N03 Merseyside and Cheshire	859	47.6%	44.3% - 51.0%	256	49.6%	43.5% - 55.7%	1,115	48.1%	45.2% - 51.0%
N06 Yorkshire	841	39.2%	36.0% - 42.6%	333	48.3%	43.0% - 53.7%	1,174	41.8%	39% - 44.7%
N07 Humber and Yorkshire Coast	409	49.1%	44.3% - 54.0%	120	60.8%	51.9% - 69.1%	529	51.8%	47.5% - 56.0%
N08 North Trent	697	52.8%	49.1% - 56.5%	218	53.7%	47.0% - 60.2%	915	53.0%	49.8% - 56.2%
N11 Pan Birmingham	639	52.4%	48.6% - 56.3%	233	61.4%	55.0% - 67.4%	872	54.8%	51.5% - 58.1%
N12 Arden	327	45.9%	40.5% - 51.3%	122	56.6%	47.7% - 65.0%	449	48.8%	44.2% - 53.4%
N20 Mount Vernon	343	50.4%	45.2% - 55.7%	107	54.2%	44.8% - 63.3%	450	51.3%	46.7% - 55.9%
N21 West London	464	46.6%	42.1% - 51.1%	176	44.3%	37.2% - 51.7%	640	45.9%	42.1% - 49.8%
N22 North London	362	44.5%	39.4% - 49.6%	117	41.9%	33.3% - 50.9%	479	43.8%	39.5% - 48.3%
N23 North East London	357	51.0%	45.8% - 56.1%	149	45.0%	37.2% - 53.0%	506	49.2%	44.9% - 53.6%
N24 South East London	456	41.0%	36.6% - 45.6%	151	43.7%	36.1% - 51.7%	607	41.7%	37.8% - 45.6%
N25 South West London	442	38.7%	34.3% - 43.3%	164	44.5%	37.1% - 52.2%	606	40.3%	36.4% - 44.2%
N26 Peninsula	603	49.4%	45.4% - 53.4%	254	60.6%	54.5% - 66.4%	857	52.7%	49.4% - 56.1%
N27 Dorset	241	35.3%	29.5% - 41.5%	110	58.2%	48.8% - 67.0%	351	42.5%	37.4% - 47.7%
N28 Avon, Somerset and Wiltshire	615	54.0%	50.0% - 57.9%	230	56.1%	49.6% - 62.3%	845	54.6%	51.2% - 57.9%
N29 3 Counties	331	60.7%	55.4% - 65.8%	116	54.3%	45.3% - 63.1%	447	59.1%	54.4% - 63.5%
N30 Thames Valley	556	50.2%	46.0% - 54.3%	218	67.0%	60.5% - 72.9%	774	54.9%	51.4% - 58.4%
N31 Central South Coast	560	48.9%	44.8% - 53.1%	284	52.8%	47.0% - 58.5%	844	50.2%	46.9% - 53.6%
N32 Surrey, West Sussex and Hampshire	271	37.3%	31.7% - 43.2%	108	50.9%	41.6% - 60.2%	379	41.2%	36.3% - 46.2%
N33 Sussex	343	51.0%	45.7% - 56.3%	146	48.6%	40.7% - 56.7%	489	50.3%	45.9% - 54.7%
N34 Kent and Medway	402	33.6%	29.1% - 38.3%	139	43.9%	35.9% - 52.2%	541	36.2%	32.3% - 40.4%
N35 Greater Midlands	653	49.6%	45.8% - 53.4%	257	50.6%	44.5% - 56.6%	910	49.9%	46.6% - 53.1%
N36 North of England	1,238	47.1%	44.3% - 49.9%	460	43.9%	39.4% - 48.5%	1,698	46.2%	43.9% - 48.6%
N37 Anglia	867	40.7%	37.5% - 44.0%	424	55.0%	50.2% - 59.6%	1,291	45.4%	42.7% - 48.1%
N38 Essex	428	40.7%	36.1% - 45.4%	171	47.4%	40.0% - 54.8%	599	42.6%	38.7% - 46.6%
N39 East Midlands	1,322	50.4%	47.7% - 53.1%	594	56.4%	52.4% - 60.3%	1,916	52.2%	50.0% - 54.5%
<b>England</b>	<b>16,342</b>	<b>46.7%</b>	<b>46.0% - 47.5%</b>	<b>6,291</b>	<b>51.7%</b>	<b>50.5% - 53.0%</b>	<b>22,633</b>	<b>48.1%</b>	<b>47.5% - 48.8%</b>

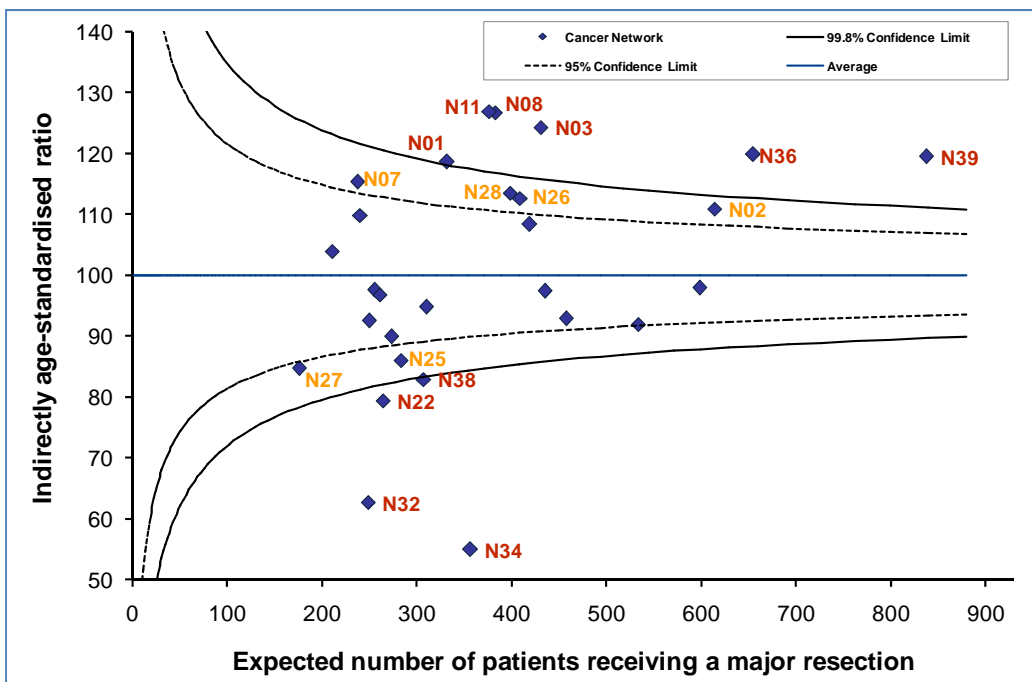
‡ MSR - Major Surgical Resections

The percentage of major surgical resections performed for each Cancer Network has been compared with the England average using funnel plots and confidence limits for all anatomic sites. The England average represents the expected patients with a record of major surgical resection. In interpreting those Networks lying outside the funnel the cautionary caveats listed in the introduction to this section should be heeded. For more information on funnel plots and their use see Appendix 4.

**Figures 3.1.3** All head and neck cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



**Figures 3.1.4** All head and neck cancers – indirectly age-standardised ratio<sup>^</sup> of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



<sup>^</sup>actual number of patients treated in NHS hospitals with a record of major surgical resection divided by expected number

## Summary

- ❖ For all head and neck cancers diagnosed in England between 2004 and 2008, half of patients had a record of a major surgical resection.
- ❖ The percentage of patients (all ages) with a record of major resection was significantly lower for males (46.7%) than for females (51.7%).
- ❖ Significantly lower rates for males were also recorded for the 50-59, 60-69 and 70-79 age bands.
  
- ❖ There was a decrease in the number of patients undergoing major surgical resection with rising age. Similar trends were evident in males and females.
- ❖ For patients aged 80 years and over, 40.4% had a record of major surgical resection compared to – for example – 46.2% for 70-79 olds and 66.7% for patients younger than 40 years of age.
- ❖ In considering the possible reasons for lower major surgical resection rates in the elderly possible significant contributory factors would be greater co-morbidity and the ability to tolerate the morbidity of surgical intervention and anaesthesia. Also, in younger patients there may be a contribution of a reluctance to use radiotherapy influenced by the potential long term effects of non surgical therapy and the potential to develop second primary tumours.
  
- ❖ The percentage of patients with a record of major surgical resection significantly decreased for more deprived quintiles in females only.
- ❖ A decrease of 2.2% in major surgical resection per quintile was recorded for females.
  
- ❖ Using funnel plots and 95% confidence limits, 14 Cancer Networks had percentages of major surgical resections significantly different from the average for England, with 9 out of the 14 networks falling outside of the 99.8% confidence limits. For age-standardised ratios, 16 Cancer Networks were significantly higher or lower than the 95% confidence limits, with 10 having ratios outside of the 99.8% confidence limits.
- ❖ The findings demonstrate variability across Networks that should be further explored to understand whether these are influenced by data quality or a true difference in clinical practice and in the development of Network guidance and its application.
- ❖ In later sections of this report the data is further examined by anatomic site.

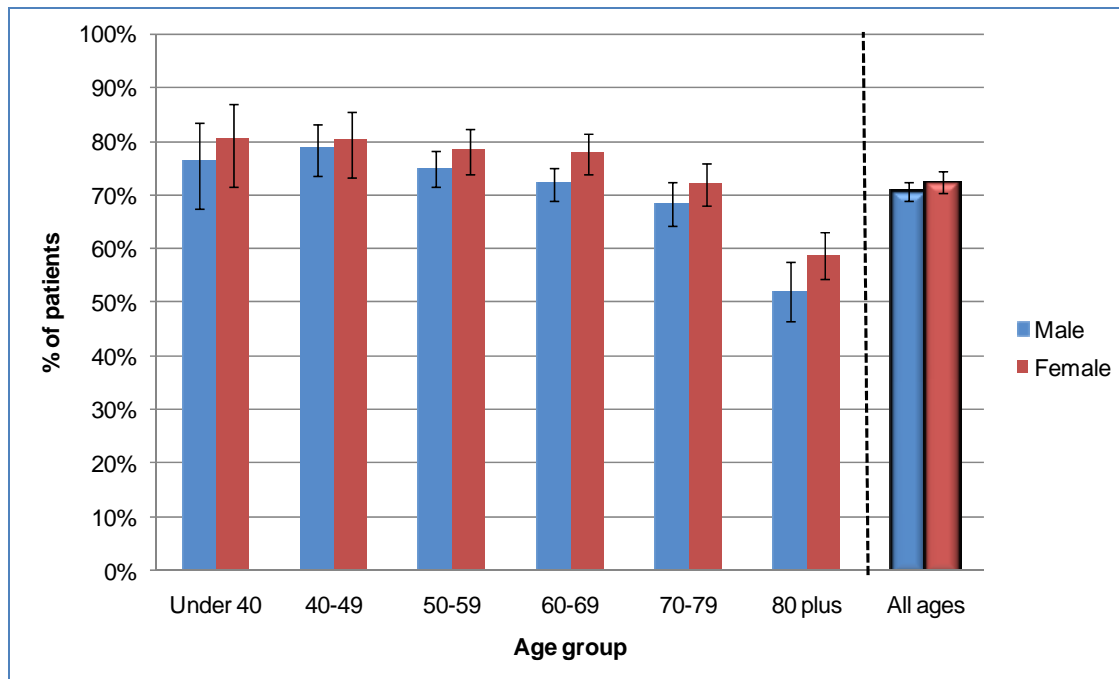
### 3.2 Oral cavity

**Table 3.2.1** Oral cavity cancers – major surgical resections by age and sex

Age group	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
< 40	106	76.4%	67.5% - 83.5%	97	80.4%	71.4% - 87.1%	203	78.3%	72.2% - 83.4%
40-49	282	78.7%	73.6% - 83.1%	156	80.1%	73.2% - 85.6%	438	79.2%	75.2% - 82.8%
50-59	645	74.9%	71.4% - 78.1%	352	78.4%	73.8% - 82.4%	997	76.1%	73.4% - 78.7%
60-69	759	72.1%	68.8% - 75.1%	463	78.0%	74.0% - 81.5%	1,222	74.3%	71.8% - 76.7%
70-79	504	68.5%	64.3% - 72.4%	508	72.0%	68.0% - 75.8%	1,012	70.3%	67.4% - 73.0%
≥ 80	308	51.9%	46.4% - 57.5%	471	58.8%	54.3% - 63.2%	779	56.1%	52.6% - 59.5%
<b>All ages</b>	<b>2,604</b>	<b>70.6%</b>	<b>68.8% - 72.3%</b>	<b>2,047</b>	<b>72.4%</b>	<b>70.5% - 74.3%</b>	<b>4,651</b>	<b>71.4%</b>	<b>70.1% - 72.7%</b>

‡ MSR - Major Surgical Resections

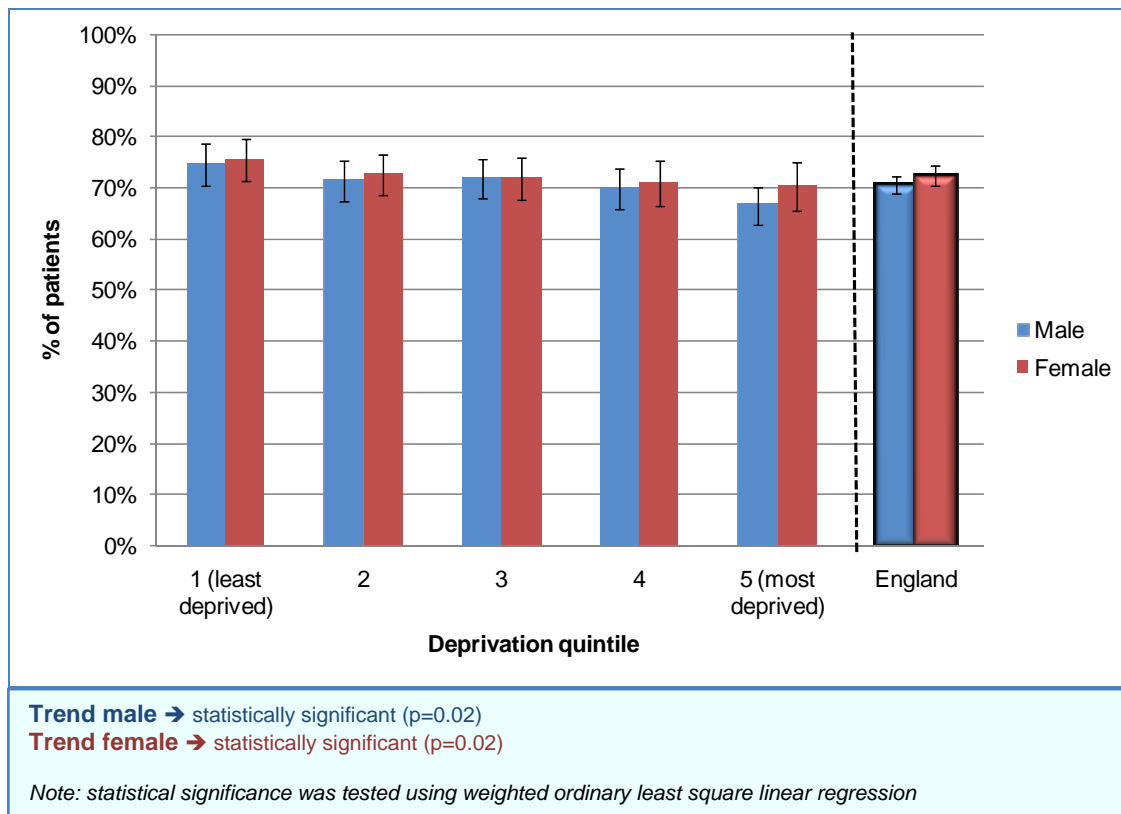
**Figure 3.2.1** Oral cavity cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by age and sex



**Table 3.2.2** Oral cavity cancers – major surgical resections by deprivation quintile and sex

Deprivation Quintile*	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
1	425	74.6%	70.2% - 78.5%	426	75.6%	71.3% - 79.4%	851	75.1%	72.1% - 77.9%
2	512	71.5%	67.4% - 75.2%	447	72.7%	68.4% - 76.6%	959	72.1%	69.1% - 74.8%
3	520	71.9%	67.9% - 75.6%	452	71.9%	67.6% - 75.8%	972	71.9%	69.0% - 74.6%
4	506	70.0%	65.8% - 73.8%	387	71.1%	66.4% - 75.4%	893	70.4%	67.4% - 73.3%
5	641	66.6%	62.9% - 70.2%	335	70.4%	65.4% - 75.1%	976	67.9%	64.9% - 70.8%
<b>England</b>	<b>2,604</b>	<b>70.6%</b>	<b>68.8% - 72.3%</b>	<b>2,047</b>	<b>72.4%</b>	<b>70.5% - 74.3%</b>	<b>4,651</b>	<b>71.4%</b>	<b>70.1% - 72.7%</b>

\* where Quintile 1 is least deprived and Quintile 5 is most deprived; ‡ MSR - Major Surgical Resections

**Figure 3.2.2** Oral cavity cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by deprivation quintile and sex

**Table 3.2.3** Oral cavity cancers – major surgical resections by Cancer Network and sex

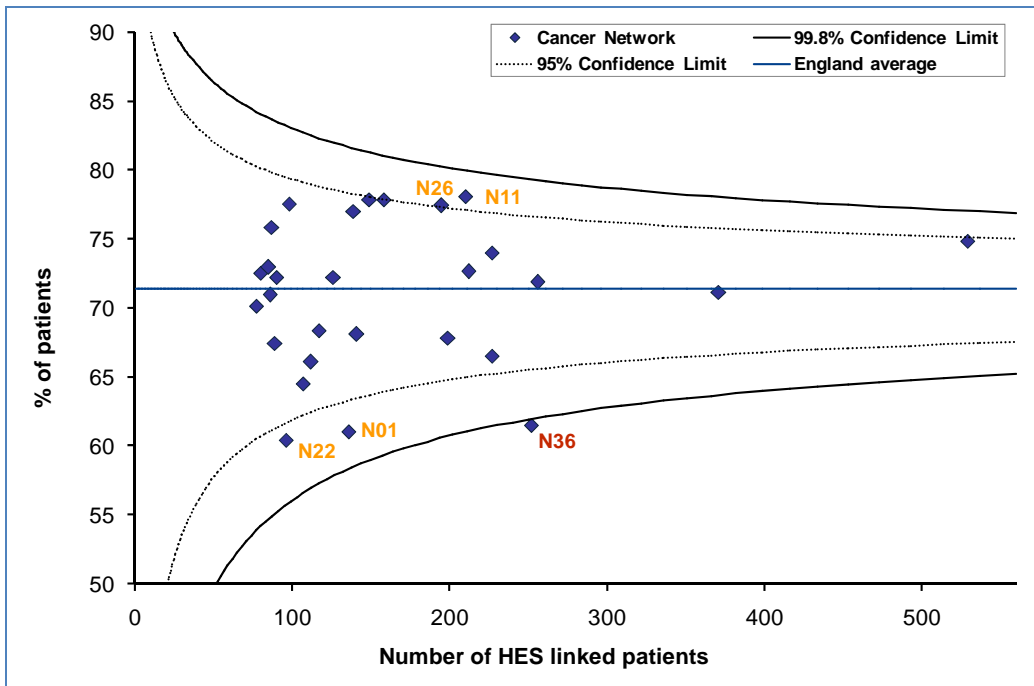
Cancer Network	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
N01 Lancashire and South Cumbria	83	59.0%	48.3% - 69.0%	53	64.2%	50.7% - 75.7%	136	61.0%	52.6% - 68.8%
N02 Greater Manchester and Cheshire	151	72.2%	64.6% - 78.7%	105	71.4%	62.2% - 79.2%	256	71.9%	66.1% - 77.0%
N03 Merseyside and Cheshire	89	74.2%	64.2% - 82.1%	50	82.0%	69.2% - 90.2%	139	77.0%	69.3% - 83.2%
N06 Yorkshire	108	74.1%	65.1% - 81.4%	104	71.2%	61.8% - 79.0%	212	72.6%	66.3% - 78.2%
N07 Humber and Yorkshire Coast	44	63.6%	48.9% - 76.2%	33	78.8%	62.2% - 89.3%	77	70.1%	59.2% - 79.2%
N08 North Trent	95	78.9%	69.7% - 85.9%	63	76.2%	64.4% - 85.0%	158	77.8%	70.8% - 83.6%
N11 Pan Birmingham	124	75.8%	67.6% - 82.5%	86	81.4%	71.9% - 88.2%	210	78.1%	72.0% - 83.2%
N12 Arden	47	74.5%	60.5% - 84.7%	40	77.5%	62.5% - 87.7%	87	75.9%	65.9% - 83.6%
N20 Mount Vernon	57	68.4%	55.5% - 79.0%	50	60.0%	46.2% - 72.4%	107	64.5%	55.1% - 72.9%
N21 West London	71	62.0%	50.3% - 72.4%	41	73.2%	58.1% - 84.3%	112	66.1%	56.9% - 74.2%
N22 North London	59	66.1%	53.4% - 76.9%	37	51.4%	35.9% - 66.6%	96	60.4%	50.4% - 69.6%
N23 North East London	43	72.1%	57.3% - 83.3%	46	63.0%	48.6% - 75.5%	89	67.4%	57.1% - 76.3%
N24 South East London	77	64.9%	53.8% - 74.7%	40	75.0%	59.8% - 85.8%	117	68.4%	59.5% - 76.1%
N25 South West London	68	75.0%	63.6% - 83.8%	58	69.0%	56.2% - 79.4%	126	72.2%	63.8% - 79.3%
N26 Peninsula	106	73.6%	64.5% - 81%	89	82.0%	72.8% - 88.6%	195	77.4%	71.1% - 82.7%
N27 Dorset	37	64.9%	48.8% - 78.2%	43	79.1%	64.8% - 88.6%	80	72.5%	61.9% - 81.1%
N28 Avon, Somerset and Wiltshire	117	68.4%	59.5% - 76.1%	82	67.1%	56.3% - 76.3%	199	67.8%	61.1% - 73.9%
N29 3 Counties	61	77.0%	65.1% - 85.8%	37	78.4%	62.8% - 88.6%	98	77.6%	68.3% - 84.7%
N30 Thames Valley	68	80.9%	70.0% - 88.5%	81	75.3%	64.9% - 83.4%	149	77.9%	70.5% - 83.8%
N31 Central South Coast	117	65.0%	56.0% - 73.0%	110	68.2%	59.0% - 76.1%	227	66.5%	60.2% - 72.3%
N32 Surrey, West Sussex and Hampshire	45	71.1%	56.6% - 82.3%	41	70.7%	55.5% - 82.4%	86	70.9%	60.6% - 79.5%
N33 Sussex	45	71.1%	56.6% - 82.3%	40	75.0%	59.8% - 85.8%	85	72.9%	62.7% - 81.2%
N34 Kent and Medway	45	68.9%	54.3% - 80.5%	45	75.6%	61.3% - 85.8%	90	72.2%	62.2% - 80.4%
N35 Greater Midlands	131	77.9%	70.0% - 84.1%	96	68.8%	58.9% - 77.1%	227	74.0%	67.9% - 79.3%
N36 North of England	156	61.5%	53.7% - 68.8%	96	61.5%	51.5% - 70.6%	252	61.5%	55.4% - 67.3%
N37 Anglia	186	68.3%	61.3% - 74.5%	185	74.1%	67.3% - 79.8%	371	71.2%	66.4% - 75.5%
N38 Essex	78	65.4%	54.3% - 75.0%	63	71.4%	59.3% - 81.1%	141	68.1%	60.0% - 75.2%
N39 East Midlands	296	73.3%	68.0% - 78.0%	233	76.8%	71.0% - 81.8%	529	74.9%	71.0% - 78.4%
<b>England</b>	<b>2,604</b>	<b>70.6%</b>	<b>68.8% - 72.3%</b>	<b>2,047</b>	<b>72.4%</b>	<b>70.5% - 74.3%</b>	<b>4,651</b>	<b>71.4%</b>	<b>70.1% - 72.7%</b>

‡ MSR - Major Surgical Resections

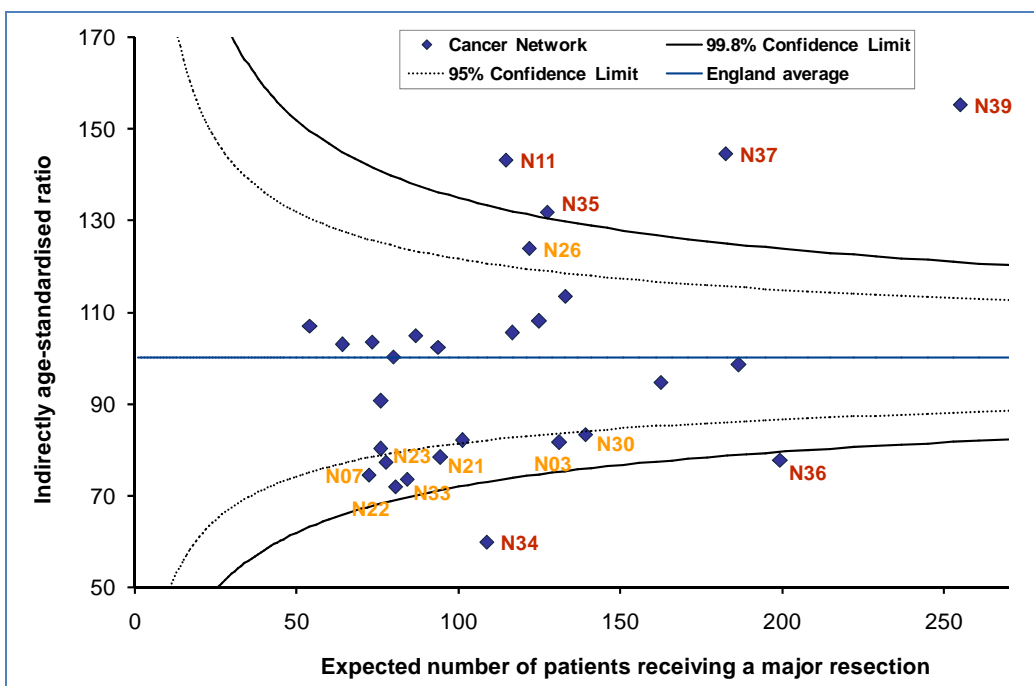


The percentage of major surgical resections performed for each Cancer Network has been compared with the England average using funnel plots and confidence limits for all anatomic sites. The England average represents the expected patients with a record of major surgical resection. In interpreting those Networks lying outside the funnel the cautionary caveats listed in the introduction to this section should be heeded. For more information on funnel plots and their use see Appendix 4.

**Figures 3.2.3** Oral cavity cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



**Figures 3.2.4** Oral cavity cancers – indirectly age-standardised ratio<sup>^</sup> of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



<sup>^</sup>actual number of patients treated in NHS hospitals with a record of major surgical resection divided by expected number

## Summary

- ❖ The accepted modality of choice in the treatment of oral cavity cancer is surgical and a higher percentage of cancers have undergone major surgical resection compared to other anatomic sites, as expected. The procedures range from simple transoral resections to major complex procedures involving complex reconstruction.
- ❖ For oral cavity cancers diagnosed in England between 2004 and 2008, the percentage of patients (all ages) with a record of major resection was lower for males (70.6%) than for females (72.4%). This difference, however, was not statistically significant.
- ❖ The difference in the percentage of major surgical resections between males and females within each age band was also not statistically significant.
- ❖ For older age groups, there was a decrease in the percentage of all oral cavity patients with a record of major surgical resection. For patients aged 80 years and over, 56.1% had a record of major resection compared to – for example – 70.3% for 70-79 olds and 78.3% for patients younger than 40 years of age. This was the only age group that was statistically significantly lower in comparison to all other age bands.
- ❖ The percentage of patients with a record of major resection significantly decreased for more deprived quintiles for males (1.8% per quintile) and females (1.2% per quintile).
- ❖ Using funnel plots and 95% confidence limits 5 Cancer Networks had percentages of major resections significantly different from the average for England, with only 1 out of the 5 networks falling outside of the 99.8% confidence limits. For age-standardised ratios, 14 Cancer Networks were significantly higher or lower than the 95% confidence limits, with 6 having ratios outside of the 99.8% confidence limits.

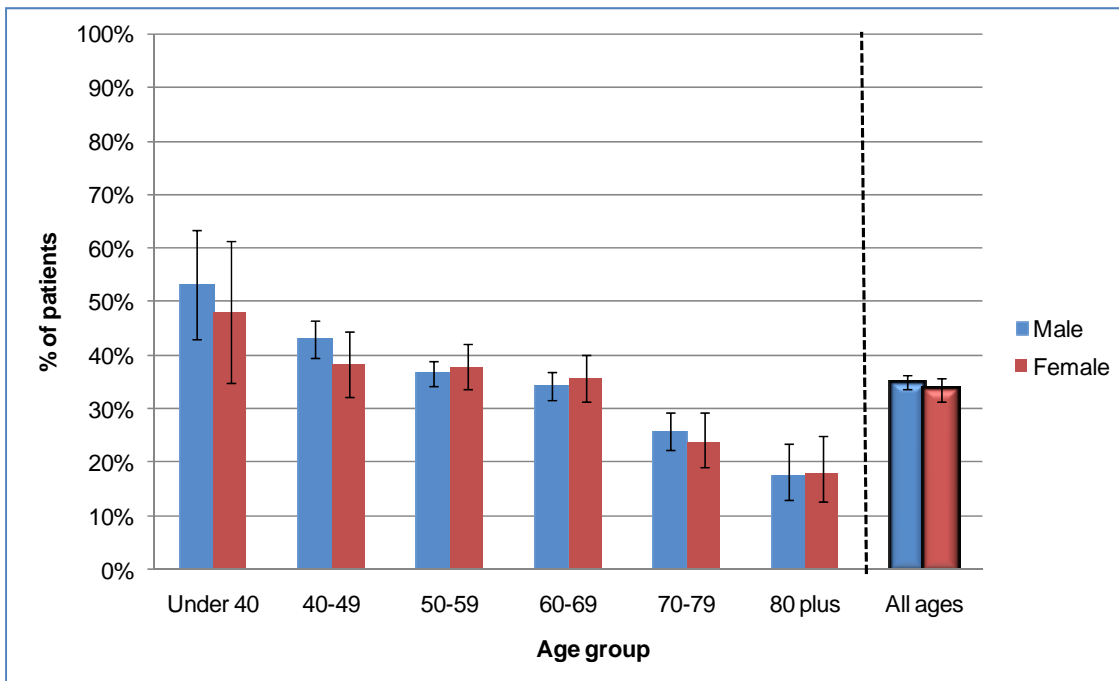
### 3.3 Oropharynx

**Table 3.3.1** Oropharynx cancers – major surgical resections by age and sex

Age group	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
< 40	90	53.3%	43.1% - 63.3%	50	48.0%	34.8% - 61.5%	140	51.4%	43.2% - 59.6%
40-49	781	42.9%	39.5% - 46.4%	240	38.3%	32.4% - 44.6%	1,021	41.8%	38.8% - 44.9%
50-59	1,677	36.5%	34.2% - 38.8%	523	37.9%	33.8% - 42.1%	2,200	36.8%	34.8% - 38.9%
60-69	1,381	34.3%	31.8% - 36.8%	446	35.7%	31.3% - 40.2%	1,827	34.6%	32.4% - 36.8%
70-79	611	25.7%	22.4% - 29.3%	280	23.9%	19.3% - 29.3%	891	25.1%	22.4% - 28.1%
≥ 80	214	17.8%	13.2% - 23.4%	149	18.1%	12.8% - 25.1%	363	17.9%	14.3% - 22.2%
<b>All ages</b>	<b>4,754</b>	<b>35.0%</b>	<b>33.6% - 36.3%</b>	<b>1,688</b>	<b>33.6%</b>	<b>31.4% - 35.9%</b>	<b>6,442</b>	<b>34.6%</b>	<b>33.5% - 35.8%</b>

‡ MSR - Major Surgical Resections

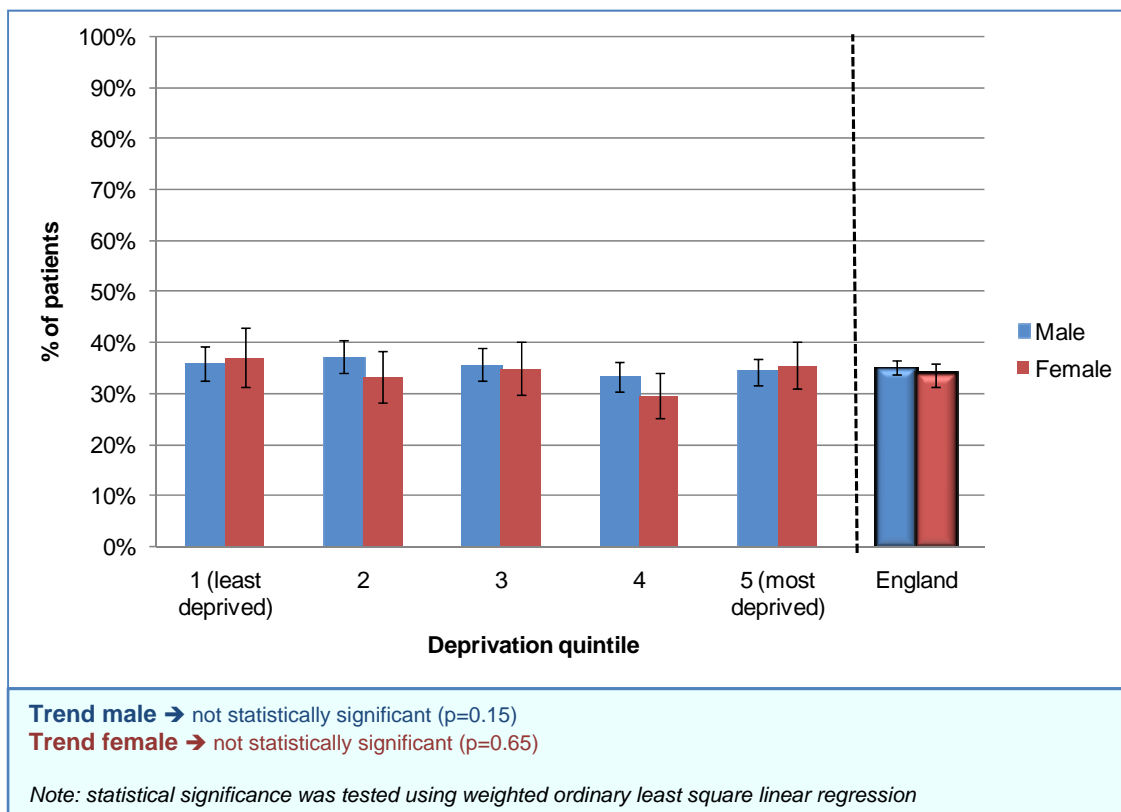
**Figure 3.3.1** Oropharynx cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by age and sex



**Table 3.3.2** Oropharynx cancers – major surgical resections by deprivation quintile and sex

Deprivation Quintile*	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
1	742	35.7%	32.3% - 39.2%	255	36.9%	31.2% - 42.9%	997	36.0%	33.1% - 39.0%
2	840	37.1%	33.9% - 40.5%	325	32.9%	28.0% - 38.2%	1,165	36.0%	33.3% - 38.8%
3	907	35.6%	32.6% - 38.8%	326	34.7%	29.7% - 40.0%	1,233	35.4%	32.7% - 38.1%
4	1,023	33.1%	30.3% - 36.1%	386	29.3%	25.0% - 34.0%	1,409	32.1%	29.7% - 34.6%
5	1,242	34.1%	31.6% - 36.8%	396	35.4%	30.8% - 40.2%	1,638	34.4%	32.2% - 36.8%
<b>England</b>	<b>4,754</b>	<b>35.0%</b>	<b>33.6% - 36.3%</b>	<b>1,688</b>	<b>33.6%</b>	<b>31.4% - 35.9%</b>	<b>6,442</b>	<b>34.6%</b>	<b>33.5% - 35.8%</b>

\* where Quintile 1 is least deprived and Quintile 5 is most deprived; ‡ MSR - Major Surgical Resections

**Figure 3.3.2** Oropharynx cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by deprivation quintile and sex

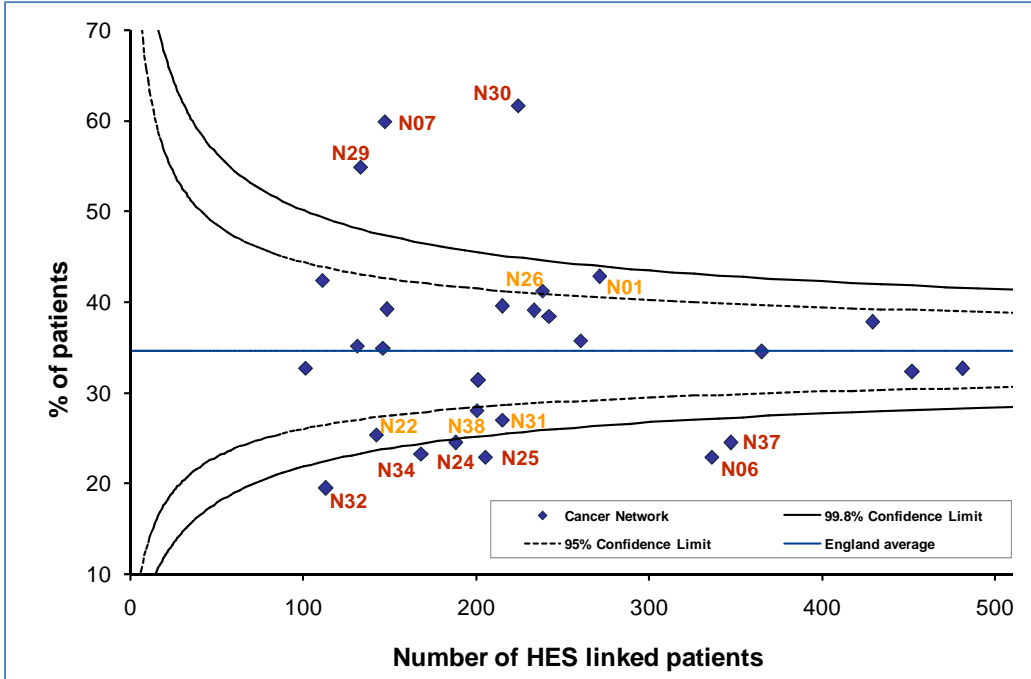
**Table 3.3.3** Oropharynx cancers – major surgical resections by Cancer Network and sex

Cancer Network	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
N01 Lancashire and South Cumbria	194	46.9%	40.0% - 53.9%	77	32.5%	23.1% - 43.5%	271	42.8%	37.1% - 48.8%
N02 Greater Manchester and Cheshire	311	37.3%	32.1% - 42.8%	118	39.0%	30.7% - 48.0%	429	37.8%	33.3% - 42.4%
N03 Merseyside and Cheshire	276	35.1%	29.8% - 40.9%	89	32.6%	23.7% - 42.9%	365	34.5%	29.8% - 39.5%
N06 Yorkshire	240	21.7%	16.9% - 27.3%	96	26.0%	18.3% - 35.6%	336	22.9%	18.7% - 27.7%
N07 Humber and Yorkshire Coast	118	61.0%	52.0% - 69.3%	29	55.2%	37.5% - 71.6%	147	59.9%	51.8% - 67.4%
N08 North Trent	197	37.1%	30.6% - 44.0%	45	44.4%	30.9% - 58.8%	242	38.4%	32.5% - 44.7%
N11 Pan Birmingham	164	37.2%	30.2% - 44.8%	51	47.1%	34.1% - 60.5%	215	39.5%	33.2% - 46.2%
N12 Arden	95	33.7%	25.0% - 43.7%	36	38.9%	24.8% - 55.1%	131	35.1%	27.5% - 43.6%
N20 Mount Vernon	97	43.3%	33.9% - 53.2%	14	35.7%	16.3% - 61.2%	111	42.3%	33.6% - 51.6%
N21 West London	137	32.8%	25.5% - 41.1%	64	28.1%	18.6% - 40.1%	201	31.3%	25.3% - 38.1%
N22 North London	114	26.3%	19.1% - 35.1%	28	21.4%	10.2% - 39.5%	142	25.4%	18.9% - 33.1%
N23 North East London	113	42.5%	33.8% - 51.7%	35	28.6%	16.3% - 45.1%	148	39.2%	31.7% - 47.2%
N24 South East London	145	25.5%	19.1% - 33.2%	43	20.9%	11.4% - 35.2%	188	24.5%	18.9% - 31.1%
N25 South West London	151	23.2%	17.2% - 30.5%	54	22.2%	13.2% - 34.9%	205	22.9%	17.7% - 29.1%
N26 Peninsula	174	42.5%	35.4% - 50.0%	64	37.5%	26.7% - 49.7%	238	41.2%	35.1% - 47.5%
N27 Dorset	74	28.4%	19.4% - 39.5%	27	44.4%	27.6% - 62.7%	101	32.7%	24.3% - 42.3%
N28 Avon, Somerset and Wiltshire	176	36.9%	30.2% - 44.3%	57	45.6%	33.4% - 58.4%	233	39.1%	33.0% - 45.4%
N29 3 Counties	98	59.2%	49.3% - 68.4%	35	42.9%	28.0% - 59.1%	133	54.9%	46.4% - 63.1%
N30 Thames Valley	165	57.6%	49.9% - 64.9%	59	72.9%	60.4% - 82.6%	224	61.6%	55.1% - 67.7%
N31 Central South Coast	152	26.3%	20.0% - 33.8%	63	28.6%	18.9% - 40.7%	215	27.0%	21.5% - 33.3%
N32 Surrey, West Sussex and Hampshire	79	17.7%	10.9% - 27.6%	34	23.5%	12.4% - 40.0%	113	19.5%	13.2% - 27.7%
N33 Sussex	97	39.2%	30.1% - 49.1%	49	26.5%	16.2% - 40.3%	146	34.9%	27.7% - 43.0%
N34 Kent and Medway	128	22.7%	16.3% - 30.6%	40	25.0%	14.2% - 40.2%	168	23.2%	17.5% - 30.2%
N35 Greater Midlands	199	33.7%	27.5% - 40.5%	61	42.6%	31.0% - 55.1%	260	35.8%	30.2% - 41.8%
N36 North of England	323	32.8%	27.9% - 38.1%	129	31.0%	23.7% - 39.4%	452	32.3%	28.2% - 36.7%
N37 Anglia	255	25.1%	20.2% - 30.8%	92	22.8%	15.4% - 32.4%	347	24.5%	20.3% - 29.3%
N38 Essex	149	32.9%	25.9% - 40.8%	51	13.7%	6.8% - 25.7%	200	28.0%	22.2% - 34.6%
N39 East Midlands	333	33.6%	28.8% - 38.9%	148	30.4%	23.6% - 38.2%	481	32.6%	28.6% - 37.0%
<b>England</b>	<b>4,754</b>	<b>35.0%</b>	<b>33.6% - 36.3%</b>	<b>1,688</b>	<b>33.6%</b>	<b>31.4% - 35.9%</b>	<b>6,442</b>	<b>34.6%</b>	<b>33.5% - 35.8%</b>

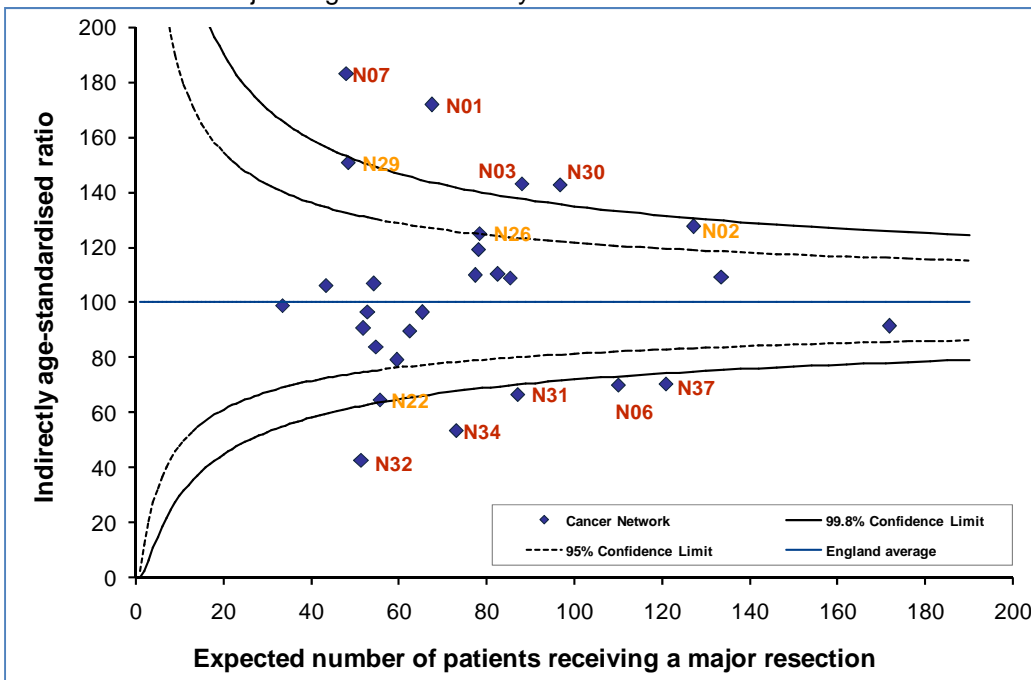
‡ MSR - Major Surgical Resections

The percentage of major surgical resections performed for each Cancer Network has been compared with the England average using funnel plots and confidence limits for all anatomic sites. The England average represents the expected patients with a record of major surgical resection. In interpreting those Networks lying outside the funnel the cautionary caveats listed in the introduction to this section should be heeded. For more information on funnel plots and their use see Appendix 4.

**Figures 3.3.3** Oropharynx cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



**Figures 3.3.4** Oropharynx cancers – indirectly age-standardised ratio<sup>^</sup> of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



<sup>^</sup>actual number of patients treated in NHS hospitals with a record of major surgical resection divided by expected number

## Summary

- ❖ The management of oropharynx cancer is currently undergoing a change in the choice of treatments heightened by recent research from the USA promoting chemoradiotherapy.
- ❖ In the time frame considered non surgical therapy was more frequently the preferred modality with many patients though undergoing neck dissection prior to or following radiotherapy. A smaller number of patients underwent primary major surgical respective procedures.
  
- ❖ For oropharynx cancers diagnosed in England between 2004 and 2008, the percentage of patients (all ages) with a record of major surgical resection was lower for females (33.6%) than for males (35.0%). This difference, however, was not statistically significant.
- ❖ When looking at different age groups, lower percentages were recorded for female patients aged 49 years or younger and for the age group 70-79. For the remaining ages the proportions were higher in females than in males. The percentages within each age band were not statistically significant.
  
- ❖ For older age groups, there was a decrease in the percentage of oropharynx patients with a record of major surgical resection. For patients aged 80 years and over, 17.9% had a record of major surgical resection compared to – for example – 25.1% for 70-79 olds and 51.4% for patients younger than 40 years of age. The percentage recorded for patients aged 80 years or older was significantly lower than proportions for all other age groups.
  
- ❖ The percentage of major surgical resections did not significantly vary across the deprivation quintiles for males and females.
  
- ❖ Using funnel plots and 95% confidence limits 14 Cancer Networks had percentages of major resections significantly different from the average for England, with 9 out of the 14 networks falling outside of the 99.8% confidence limits. For age-standardised ratios, 13 Cancer Networks were significantly higher or lower than the 95% confidence limits, with 9 having ratios outside of the 99.8% confidence limits.

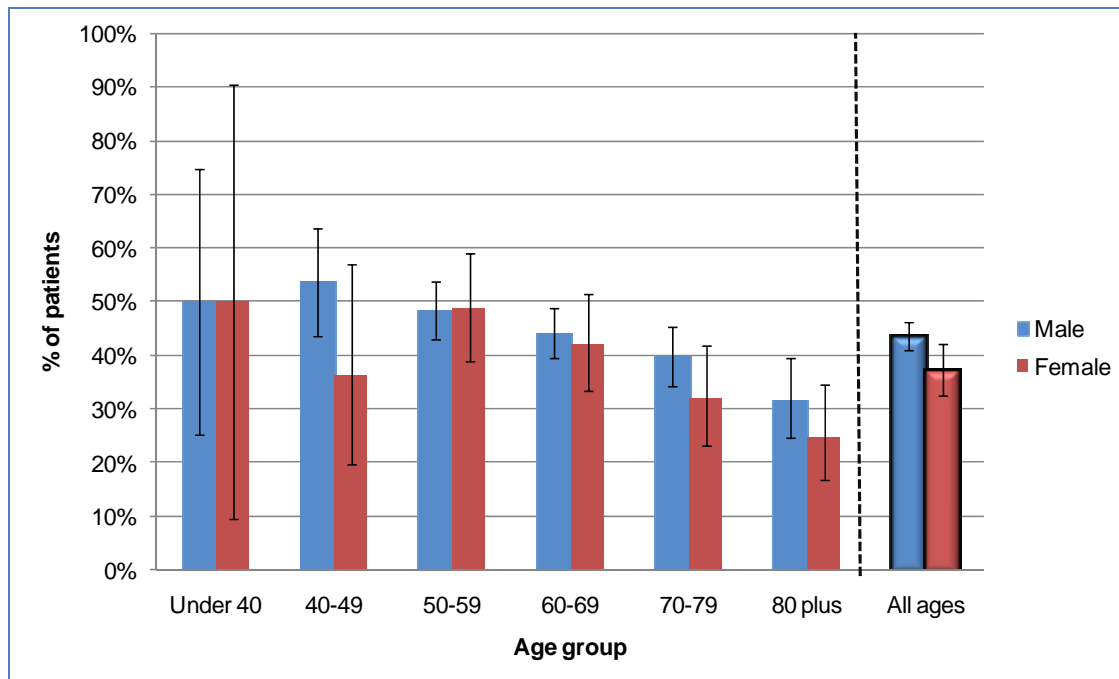
### 3.4 Hypopharynx

**Table 3.4.1** Hypopharynx cancers – major surgical resections by age and sex

Age group	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
< 40	12	50.0%	25.4% - 74.6%	2	50.0%	9.5% - 90.5%	14	50.0%	26.8% - 73.2%
40-49	91	53.8%	43.7% - 63.7%	22	36.4%	19.7% - 57.0%	113	50.4%	41.4% - 59.5%
50-59	343	48.4%	43.2% - 53.7%	92	48.9%	38.9% - 59.0%	435	48.5%	43.8% - 53.2%
60-69	437	44.2%	39.6% - 48.9%	109	42.2%	33.4% - 51.6%	546	43.8%	39.7% - 48.0%
70-79	297	39.7%	34.3% - 45.4%	94	31.9%	23.4% - 41.9%	391	37.9%	33.2% - 42.8%
≥ 80	148	31.8%	24.8% - 39.6%	89	24.7%	16.9% - 34.6%	237	29.1%	23.7% - 35.2%
<b>All ages</b>	<b>1,328</b>	<b>43.6%</b>	<b>41.0% - 46.3%</b>	<b>408</b>	<b>37.3%</b>	<b>32.7% - 42.0%</b>	<b>1,736</b>	<b>42.1%</b>	<b>39.8% - 44.4%</b>

‡ MSR - Major Surgical Resections

**Figure 3.4.1** Hypopharynx cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by age and sex



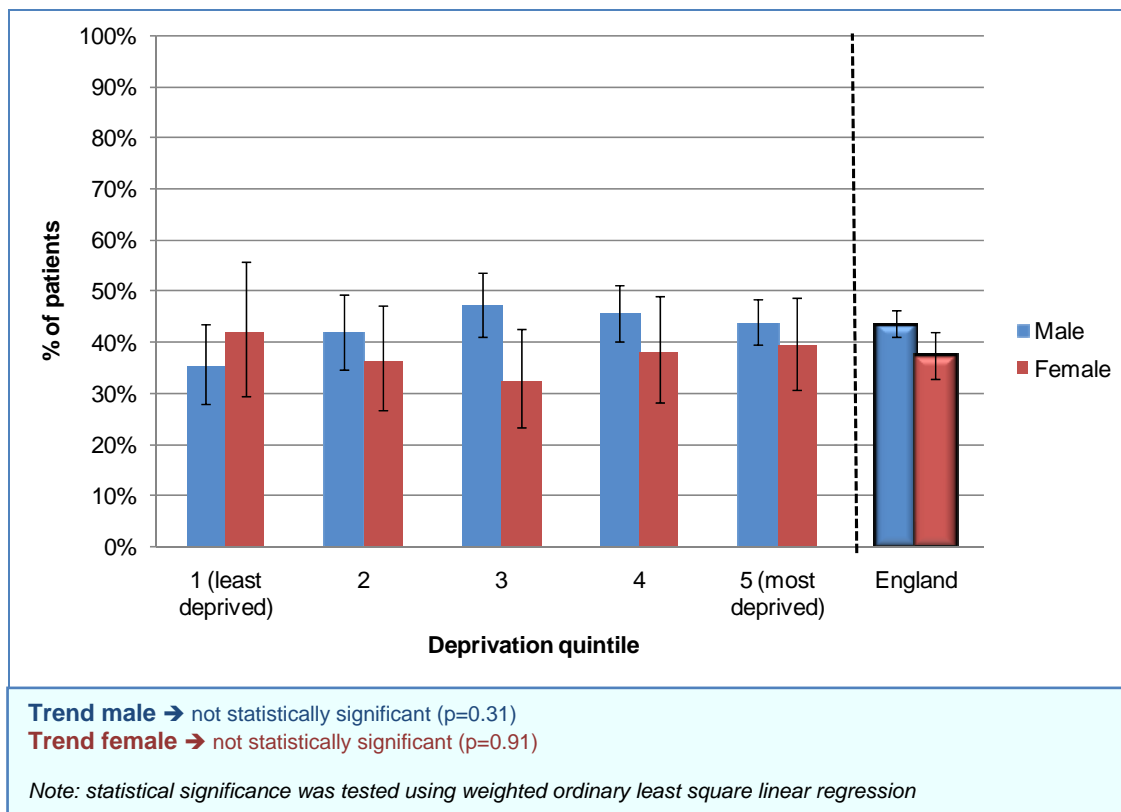


**Table 3.4.2** Hypopharynx cancers – major surgical resections by deprivation quintile and sex

Deprivation Quintile*	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
1	142	35.2%	27.8% - 43.4%	50	42.0%	29.4% - 55.8%	192	37.0%	30.5% - 44.0%
2	175	41.7%	34.7% - 49.1%	80	36.3%	26.6% - 47.2%	255	40.0%	34.2% - 46.1%
3	233	47.2%	40.9% - 53.6%	87	32.2%	23.3% - 42.6%	320	43.1%	37.8% - 48.6%
4	301	45.5%	40.0% - 51.2%	79	38.0%	28.1% - 49.0%	380	43.9%	39.0% - 49.0%
5	477	43.8%	39.4% - 48.3%	112	39.3%	30.7% - 48.5%	589	43.0%	39.0% - 47.0%
<b>England</b>	<b>1,328</b>	<b>43.6%</b>	<b>41.0% - 46.3%</b>	<b>408</b>	<b>37.3%</b>	<b>32.7% - 42.0%</b>	<b>1,736</b>	<b>42.1%</b>	<b>39.8% - 44.4%</b>

\* where Quintile 1 is least deprived and Quintile 5 is most deprived; ‡ MSR - Major Surgical Resections

**Figure 3.4.2** Hypopharynx cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by deprivation quintile and sex



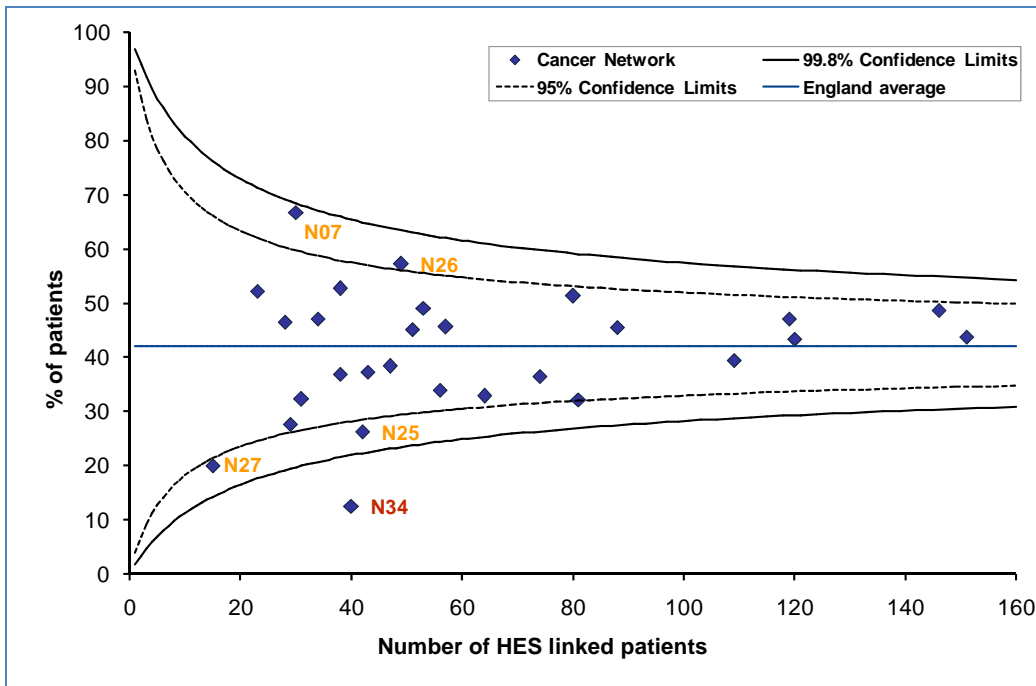
**Table 3.4.3** Hypopharynx cancers – major surgical resections by Cancer Network and sex

Cancer Network	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
N01 Lancashire and South Cumbria	61	39.3%	28.1% - 51.9%	13	23.1%	8.2% - 50.3%	74	36.5%	26.4% - 47.9%
N02 Greater Manchester and Cheshire	97	40.2%	31.0% - 50.2%	23	56.5%	36.8% - 74.4%	120	43.3%	34.8% - 52.3%
N03 Merseyside and Cheshire	99	46.5%	37.0% - 56.2%	20	50.0%	29.9% - 70.1%	119	47.1%	38.3% - 56.0%
N06 Yorkshire	85	35.3%	26.0% - 45.9%	24	54.2%	35.1% - 72.1%	109	39.4%	30.8% - 48.8%
N07 Humber and Yorkshire Coast	24	66.7%	46.7% - 82.0%	6	66.7%	30.0% - 90.3%	30	66.7%	48.8% - 80.8%
N08 North Trent	68	51.5%	39.8% - 62.9%	20	25.0%	11.2% - 46.9%	88	45.5%	35.5% - 55.8%
N11 Pan Birmingham	61	52.5%	40.2% - 64.5%	19	47.4%	27.3% - 68.3%	80	51.3%	40.5% - 61.9%
N12 Arden	34	38.2%	23.9% - 55.0%	9	33.3%	12.1% - 64.6%	43	37.2%	24.4% - 52.1%
N20 Mount Vernon	20	45.0%	25.8% - 65.8%	3	100.0%	43.9% - 100%	23	52.2%	33.0% - 70.8%
N21 West London	44	36.4%	23.8% - 51.1%	12	25.0%	8.9% - 53.2%	56	33.9%	22.9% - 47.0%
N22 North London	25	40.0%	23.4% - 59.3%	6	0.0%	0.0% - 39%	31	32.3%	18.6% - 49.9%
N23 North East London	29	44.8%	28.4% - 62.5%	9	11.1%	2.0% - 43.5%	38	36.8%	23.4% - 52.7%
N24 South East London	41	46.3%	32.1% - 61.3%	10	40.0%	16.8% - 68.7%	51	45.1%	32.3% - 58.6%
N25 South West London	36	25.0%	13.8% - 41.1%	6	33.3%	9.7% - 70.0%	42	26.2%	15.3% - 41.1%
N26 Peninsula	36	58.3%	42.2% - 72.9%	13	53.8%	29.1% - 76.8%	49	57.1%	43.3% - 70.0%
N27 Dorset	13	7.7%	1.4% - 33.3%	2	100.0%	34.2% - 100.0%	15	20.0%	7.0% - 45.2%
N28 Avon, Somerset and Wiltshire	40	50.0%	35.2% - 64.8%	17	35.3%	17.3% - 58.7%	57	45.6%	33.4% - 58.4%
N29 3 Counties	23	52.2%	33.0% - 70.8%	5	20.0%	3.6% - 62.4%	28	46.4%	29.5% - 64.2%
N30 Thames Valley	40	47.5%	32.9% - 62.5%	13	53.8%	29.1% - 76.8%	53	49.1%	36.1% - 62.1%
N31 Central South Coast	31	45.2%	29.2% - 62.2%	16	25.0%	10.2% - 49.5%	47	38.3%	25.8% - 52.6%
N32 Surrey, West Sussex and Hampshire	19	21.1%	8.5% - 43.3%	10	40.0%	16.8% - 68.7%	29	27.6%	14.7% - 45.7%
N33 Sussex	25	52.0%	33.5% - 70.0%	9	33.3%	12.1% - 64.6%	34	47.1%	31.5% - 63.3%
N34 Kent and Medway	34	11.8%	4.7% - 26.6%	6	16.7%	3.0% - 56.4%	40	12.5%	5.5% - 26.1%
N35 Greater Midlands	49	38.8%	26.4% - 52.8%	15	13.3%	3.7% - 37.9%	64	32.8%	22.6% - 45%
N36 North of England	119	47.9%	39.1% - 56.8%	32	28.1%	15.6% - 45.4%	151	43.7%	36.1% - 51.7%
N37 Anglia	51	31.4%	20.3% - 45.0%	30	33.3%	19.2% - 51.2%	81	32.1%	22.9% - 42.9%
N38 Essex	23	56.5%	36.8% - 74.4%	15	46.7%	24.8% - 69.9%	38	52.6%	37.3% - 67.5%
N39 East Midlands	101	54.5%	44.8% - 63.8%	45	35.6%	23.2% - 50.2%	146	48.6%	40.7% - 56.7%
<b>England</b>	<b>1,328</b>	<b>43.6%</b>	<b>41.0% - 46.3%</b>	<b>408</b>	<b>37.3%</b>	<b>32.7% - 42.0%</b>	<b>1,736</b>	<b>42.1%</b>	<b>39.8% - 44.4%</b>

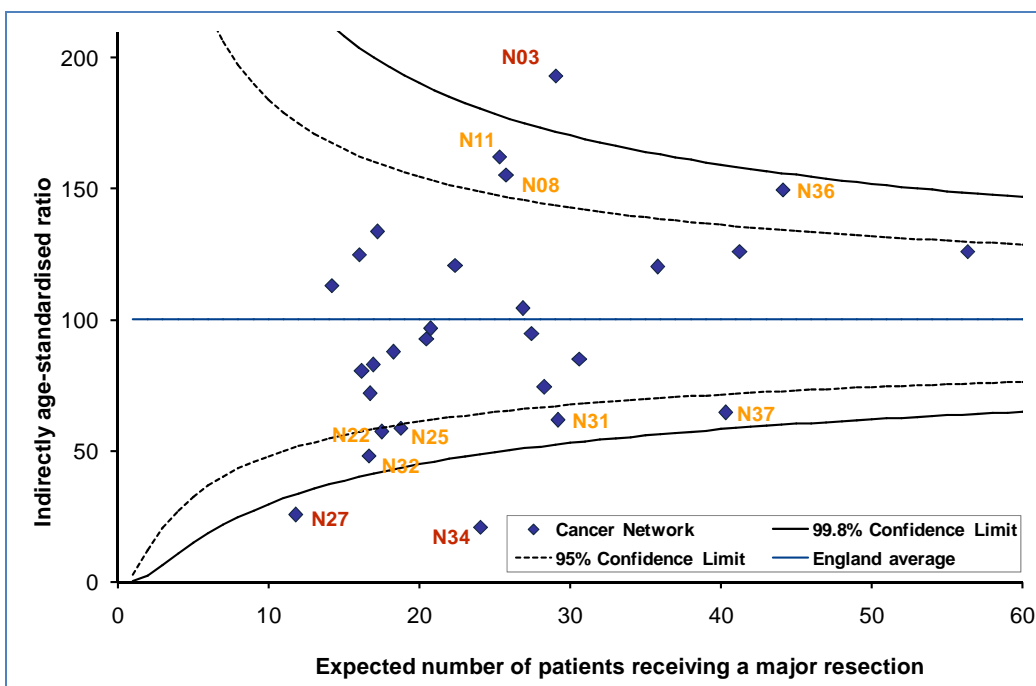
‡ MSR - Major Surgical Resections

The percentage of major surgical resections performed for each Cancer Network has been compared with the England average using funnel plots and confidence limits for all anatomic sites. The England average represents the expected patients with a record of major surgical resection. In interpreting those Networks lying outside the funnel the cautionary caveats listed in the introduction to this section should be heeded. For more information on funnel plots and their use see Appendix 4.

**Figures 3.4.3** Hypopharynx cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



**Figures 3.4.4** Hypopharynx cancers – indirectly age-standardised ratio<sup>^</sup> of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



<sup>^</sup>actual number of patients treated in NHS hospitals with a record of major surgical resection divided by expected number

## Summary

- ❖ The majority of hypopharyngeal cancers present with advanced disease presenting a significant treatment challenge.
- ❖ The established treatment for the majority of patients with hypopharynx cancer in England is primary surgery. However, studies from abroad have shown no difference in survival comparing primary surgery to primary radiotherapy, believing the differences in survival previously reported are related to patient selection bias. Hypopharyngeal carcinoma has a high incidence of co-morbid conditions.
  
- ❖ For hypopharynx cancers diagnosed in England between 2004 and 2008, the percentage of patients (all ages) with a record of major surgical resection was lower for females (37.3%) than for males (43.6%). This difference, however, was not statistically significant.
- ❖ Females had a lower percentage of major surgical resections for four out of the six age bands examined. However, the difference in the percentage of major surgical resections between females and males was not statistically significant for all age groups.
  
- ❖ For older age groups, there was a decrease in the percentage of hypopharynx patients with a record of surgical major resection. For patients aged 80 years and over, 29.1% had a record of major resection compared to – for example – 43.8% for 60-69 olds and 50.4% for 40-49 olds.
  
- ❖ The percentage of major surgical resections did not significantly vary across the deprivation quintiles for males and females.
  
- ❖ Using funnel plots and 95% confidence limits 5 Cancer Networks had percentages of major surgical resections significantly different from the average for England, with only 1 out of the 5 networks falling outside of the 99.8% confidence limits. For age-standardised ratios, 11 Cancer Networks were significantly higher or lower than the 95% confidence limits, with 3 having ratios outside of the 99.8% confidence limits.
- ❖ The incidence of hypopharynx cancer is lower than other head and neck cancer sub-sites and thus Network results may be influenced by small case numbers.

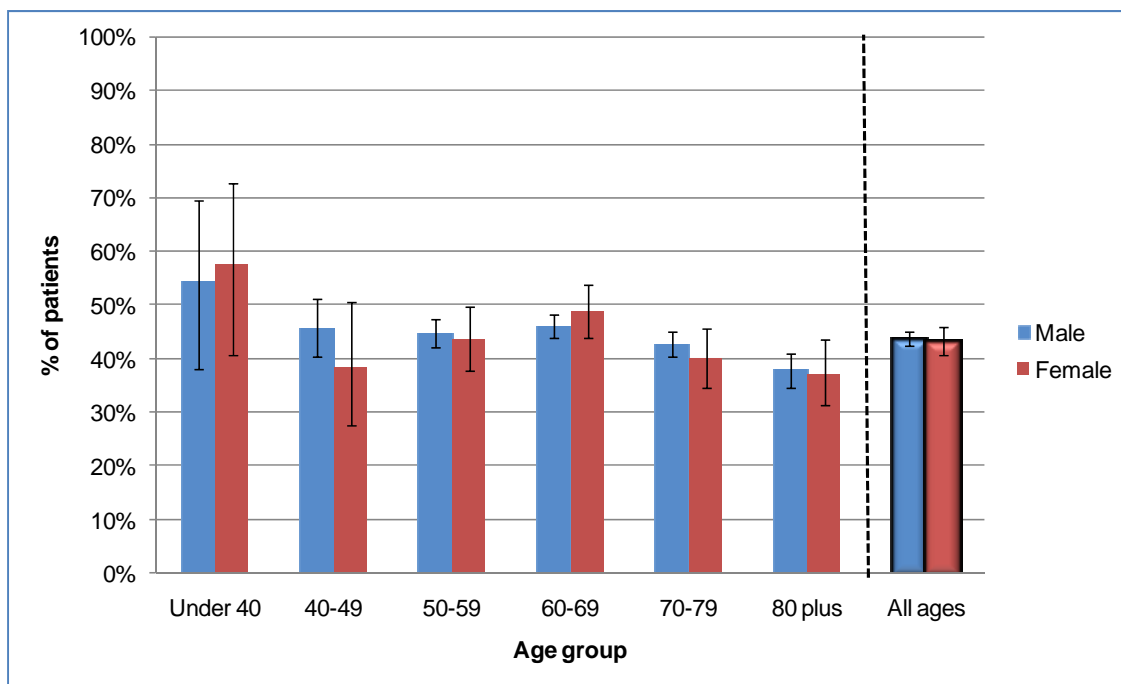
### 3.5 Larynx

**Table 3.5.1** Larynx cancers – major surgical resections by age and sex

Age group	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
< 40	35	54.3%	38.2% - 69.5%	33	57.6%	40.8% - 72.8%	68	55.9%	44.1% - 67.1%
40-49	319	45.8%	40.4% - 51.3%	65	38.5%	27.6% - 50.6%	384	44.5%	39.6% - 49.5%
50-59	1,312	44.7%	42.1% - 47.4%	268	43.7%	37.8% - 49.6%	1,580	44.6%	42.1% - 47.0%
60-69	2,171	46.1%	44.0% - 48.2%	391	48.8%	43.9% - 53.8%	2,562	46.5%	44.6% - 48.4%
70-79	1,799	42.7%	40.4% - 45.0%	310	40.0%	34.7% - 45.5%	2,109	42.3%	40.2% - 44.4%
≥ 80	925	37.7%	34.7% - 40.9%	241	37.3%	31.5% - 43.6%	1,166	37.7%	34.9% - 40.5%
<b>All ages</b>	<b>6,561</b>	<b>43.7%</b>	<b>42.5% - 44.9%</b>	<b>1,308</b>	<b>43.3%</b>	<b>40.6% - 46.0%</b>	<b>7,869</b>	<b>43.7%</b>	<b>42.6% - 44.8%</b>

‡ MSR - Major Surgical Resections

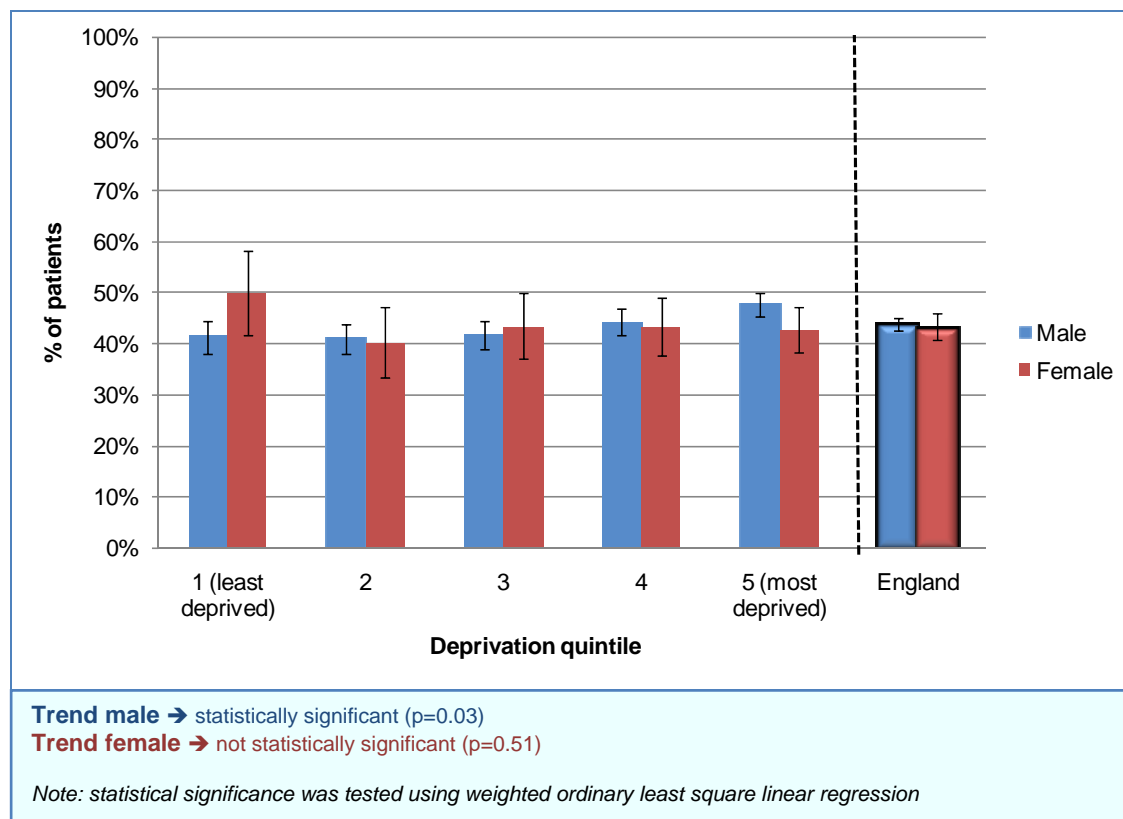
**Figure 3.5.1** Larynx cancers – percentage NHS of patients treated in NHS hospitals with a record of a major surgical resection by age and sex



**Table 3.5.2** Larynx cancers – major surgical resections by deprivation quintile and sex

Deprivation Quintile*	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
1	908	41.2%	38.0% - 44.4%	136	50.0%	41.7% - 58.3%	1,044	42.3%	39.4% - 45.4%
2	1,084	40.9%	38.0% - 43.8%	197	40.1%	33.5% - 47.1%	1,281	40.7%	38.1% - 43.5%
3	1,236	41.6%	38.9% - 44.4%	231	43.3%	37.1% - 49.7%	1,467	41.9%	39.4% - 44.4%
4	1,419	44.1%	41.6% - 46.7%	291	43.3%	37.7% - 49.0%	1,710	44.0%	41.6% - 46.3%
5	1,914	47.6%	45.4% - 49.9%	453	42.6%	38.1% - 47.2%	2,367	46.7%	44.7% - 48.7%
<b>England</b>	<b>6,561</b>	<b>43.7%</b>	<b>42.5% - 44.9%</b>	<b>1,308</b>	<b>43.3%</b>	<b>40.6% - 46.0%</b>	<b>7,869</b>	<b>43.7%</b>	<b>42.6% - 44.8%</b>

\* where Quintile 1 is least deprived and Quintile 5 is most deprived; ‡ MSR - Major Surgical Resections

**Figure 3.5.2** Larynx cancers – percentage NHS of patients treated in NHS hospitals with a record of a major surgical resection by deprivation quintile and sex

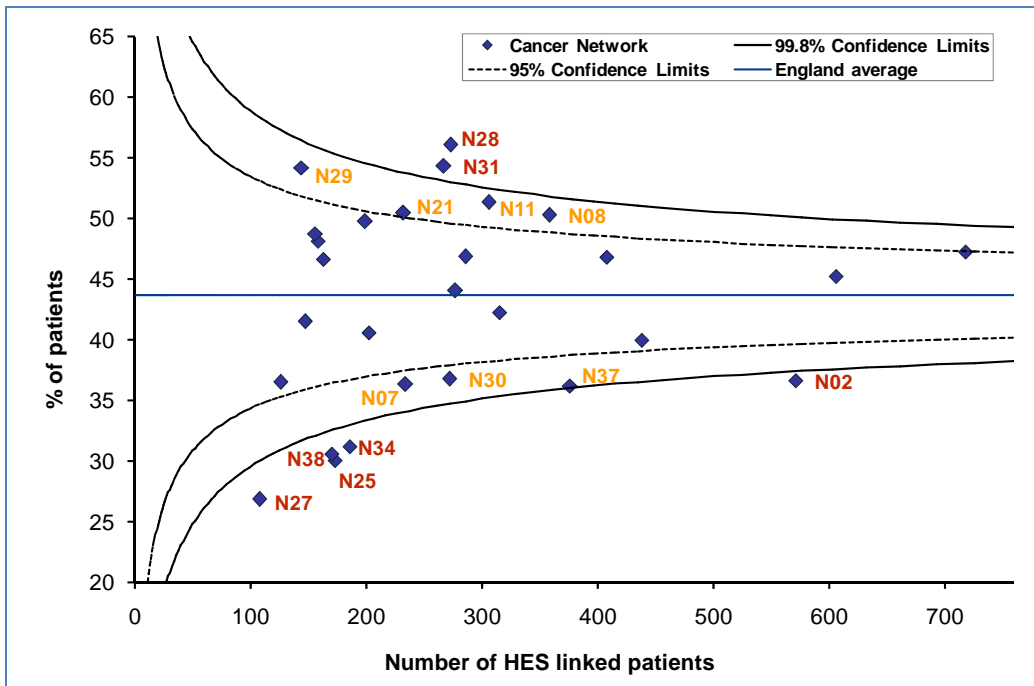
**Table 3.5.3** Larynx cancers – major surgical resections by Cancer Network and sex

Cancer Network	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
N01 Lancashire and South Cumbria	253	45.1%	39.0% - 51.2%	62	30.6%	20.6% - 43.0%	315	42.2%	36.9% - 47.7%
N02 Greater Manchester and Cheshire	466	36.5%	32.2% - 40.9%	105	37.1%	28.5% - 46.7%	571	36.6%	32.8% - 40.6%
N03 Merseyside and Cheshire	342	48.0%	42.7% - 53.2%	66	40.9%	29.9% - 53.0%	408	46.8%	42.0% - 51.7%
N06 Yorkshire	370	40.3%	35.4% - 45.3%	68	38.2%	27.6% - 50.1%	438	40.0%	35.5% - 44.6%
N07 Humber and Yorkshire Coast	202	34.7%	28.4% - 41.4%	32	46.9%	30.9% - 63.6%	234	36.3%	30.4% - 42.7%
N08 North Trent	294	51.7%	46.0% - 57.4%	64	43.8%	32.3% - 55.9%	358	50.3%	45.1% - 55.4%
N11 Pan Birmingham	259	50.6%	44.5% - 56.6%	47	55.3%	41.2% - 68.6%	306	51.3%	45.7% - 56.9%
N12 Arden	124	41.1%	32.9% - 49.9%	23	43.5%	25.6% - 63.2%	147	41.5%	33.8% - 49.6%
N20 Mount Vernon	141	46.8%	38.8% - 55.0%	17	58.8%	36.0% - 78.4%	158	48.1%	40.4% - 55.8%
N21 West London	193	51.3%	44.3% - 58.3%	39	46.2%	31.6% - 61.4%	232	50.4%	44.0% - 56.8%
N22 North London	138	47.8%	39.7% - 56.1%	25	40.0%	23.4% - 59.3%	163	46.6%	39.1% - 54.3%
N23 North East London	152	52.6%	44.7% - 60.4%	47	40.4%	27.6% - 54.7%	199	49.7%	42.9% - 56.6%
N24 South East London	168	39.9%	32.8% - 47.4%	34	44.1%	28.9% - 60.5%	202	40.6%	34.1% - 47.5%
N25 South West London	153	31.4%	24.6% - 39.1%	20	20.0%	8.1% - 41.6%	173	30.1%	23.7% - 37.3%
N26 Peninsula	230	41.3%	35.1% - 47.8%	47	57.4%	43.3% - 70.5%	277	44.0%	38.3% - 49.9%
N27 Dorset	90	25.6%	17.7% - 35.4%	18	33.3%	16.3% - 56.3%	108	26.9%	19.4% - 35.9%
N28 Avon, Somerset and Wiltshire	231	56.3%	49.8% - 62.5%	42	54.8%	39.9% - 68.8%	273	56.0%	50.1% - 61.8%
N29 3 Counties	125	54.4%	45.7% - 62.9%	19	52.6%	31.7% - 72.7%	144	54.2%	46.0% - 62.1%
N30 Thames Valley	237	35.4%	29.6% - 41.7%	35	45.7%	30.5% - 61.8%	272	36.8%	31.3% - 42.6%
N31 Central South Coast	209	53.6%	46.8% - 60.2%	58	56.9%	44.1% - 68.8%	267	54.3%	48.3% - 60.2%
N32 Surrey, West Sussex and Hampshire	113	36.3%	28.0% - 45.5%	13	38.5%	17.7% - 64.5%	126	36.5%	28.6% - 45.2%
N33 Sussex	133	48.1%	39.8% - 56.5%	23	52.2%	33.0% - 70.8%	156	48.7%	41.0% - 56.5%
N34 Kent and Medway	160	34.4%	27.5% - 42.0%	26	11.5%	4.0% - 29.0%	186	31.2%	25.0% - 38.2%
N35 Greater Midlands	235	48.9%	42.6% - 55.3%	51	37.3%	25.3% - 51.0%	286	46.9%	41.1% - 52.6%
N36 North of England	579	48.5%	44.5% - 52.6%	139	41.7%	33.9% - 50.0%	718	47.2%	43.6% - 50.9%
N37 Anglia	314	34.1%	29.1% - 39.5%	62	46.8%	34.9% - 59.0%	376	36.2%	31.5% - 41.1%
N38 Essex	144	29.2%	22.4% - 37.1%	26	38.5%	22.4% - 57.5%	170	30.6%	24.2% - 37.9%
N39 East Midlands	506	44.5%	40.2% - 48.8%	100	49.0%	39.4% - 58.7%	606	45.2%	41.3% - 49.2%
<b>England</b>	<b>6,561</b>	<b>43.7%</b>	<b>42.5% - 44.9%</b>	<b>1,308</b>	<b>43.3%</b>	<b>40.6% - 46.0%</b>	<b>7,869</b>	<b>43.7%</b>	<b>42.6% - 44.8%</b>

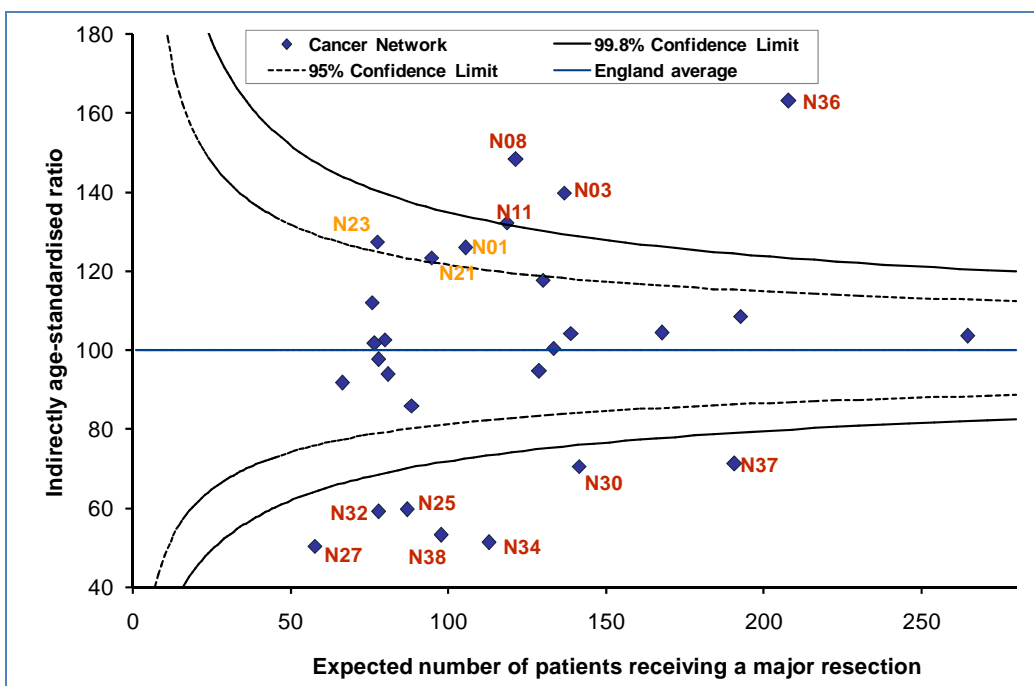
‡ MSR - Major Surgical Resections

The percentage of major surgical resections performed for each Cancer Network has been compared with the England average using funnel plots and confidence limits for all anatomic sites. The England average represents the expected patients with a record of major surgical resection. In interpreting those Networks lying outside the funnel the cautionary caveats listed in the introduction to this section should be heeded. For more information on funnel plots and their use see Appendix 4.

**Figures 3.5.3** Larynx cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



**Figures 3.5.4** Larynx cancers – indirectly age-standardised ratio<sup>^</sup> of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



<sup>^</sup>actual number of patients treated in NHS hospitals with a record of major surgical resection divided by expected number



## Summary

- ❖ The traditional treatment of larynx cancer in England has been by radiotherapy, with surgery performed in advanced disease. In the last 10 years, the popularity of transoral laser resection has risen for early disease.
- ❖ For larynx cancers diagnosed in England between 2004 and 2008, the percentage of patients (all ages) with a record of major surgical resection was similar for females (43.3%) than for males (43.7%).
- ❖ The difference in the percentage of major surgical resections between females and males within each age band was also not statistically significant.
- ❖ For older age groups, there was a decrease in the percentage of larynx patients with a record of major surgical resection. For patients aged 80 years and over, 37.7% had a record of major resection compared to – for example – 46.5% for 60-69 olds and 55.9% for patients younger than 40 years of age.
- ❖ The percentage of major surgical resection did not significantly vary across the deprivation quintiles for females. However, for males a significant increase (1.8% per quintile) in the percentage of patients with a record of major resection was recorded.
- ❖ Using funnel plots and 95% confidence limits 14 Cancer Networks had percentages of major surgical resections significantly different from the average for England, with 7 out of the 14 networks falling outside of the 99.8% confidence limits. For age-standardised ratios, 14 Cancer Networks were significantly higher or lower than the 95% confidence limits, with as many as 11 having ratios outside of the 99.8% confidence limits.
- ❖ There are wide variations between Networks in percentages and ratios of major surgical resections, and this matches the findings from the 6th DAHNO report. The spread of Networks outside the confidence limits of the funnel plots would suggest local multidisciplinary team (MDT) choices of a preferred modality for intervention between surgery and radiotherapy. Recent standards of care have suggested that all patients with early stage larynx cancer should be offered the choice of transoral laser surgery as well as radiotherapy with the belief that the treatments exhibit equipoise in outcome.

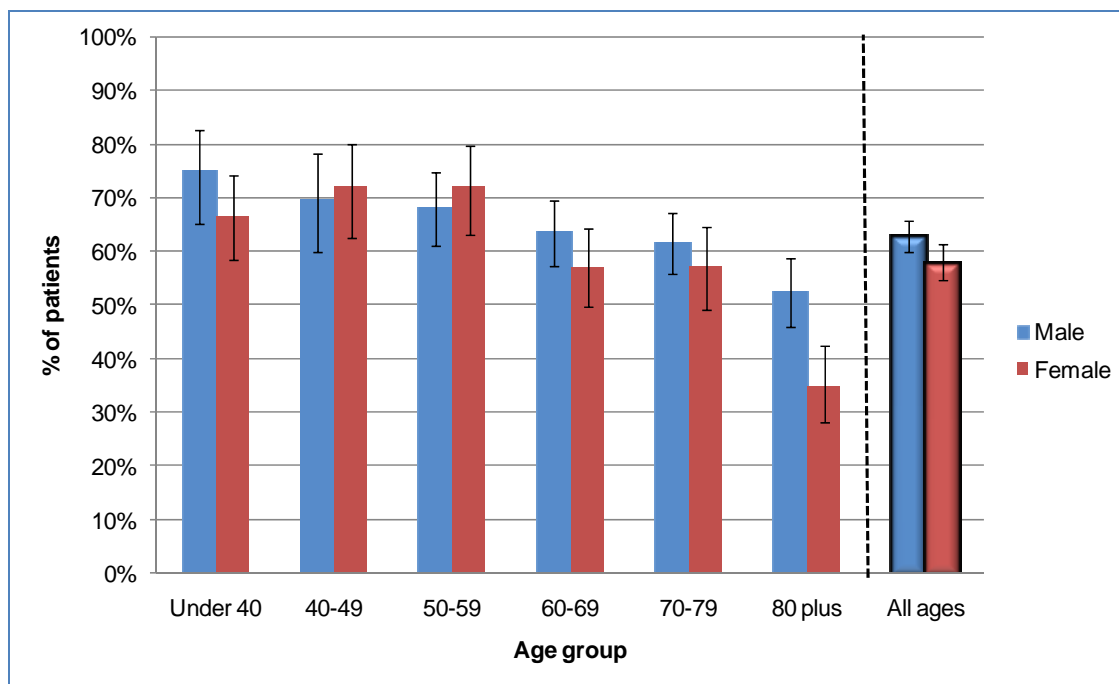
### 3.6 Major salivary gland

**Table 3.6.1** Major salivary gland cancers – major surgical resections by age and sex

Age group	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
< 40	92	75.0%	65.3% - 82.7%	135	66.7%	58.4% - 74.1%	227	70.0%	63.8% - 75.6%
40-49	93	69.9%	59.9% - 78.3%	97	72.2%	62.5% - 80.1%	190	71.1%	64.2% - 77.0%
50-59	173	68.2%	60.9% - 74.7%	111	72.1%	63.1% - 79.6%	284	69.7%	64.1% - 74.8%
60-69	231	63.6%	57.3% - 69.6%	177	57.1%	49.7% - 64.1%	408	60.8%	56.0% - 65.4%
70-79	271	61.6%	55.7% - 67.2%	154	57.1%	49.2% - 64.7%	425	60.0%	55.3% - 64.5%
≥ 80	235	52.3%	46.0% - 58.6%	166	34.9%	28.1% - 42.5%	401	45.1%	40.3% - 50.0%
<b>All ages</b>	<b>1,095</b>	<b>62.9%</b>	<b>60.0% - 65.7%</b>	<b>840</b>	<b>58.0%</b>	<b>54.6% - 61.3%</b>	<b>1,935</b>	<b>60.8%</b>	<b>58.6% - 62.9%</b>

‡ MSR - Major Surgical Resections

**Figure 3.6.1** Major salivary gland cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by age and sex

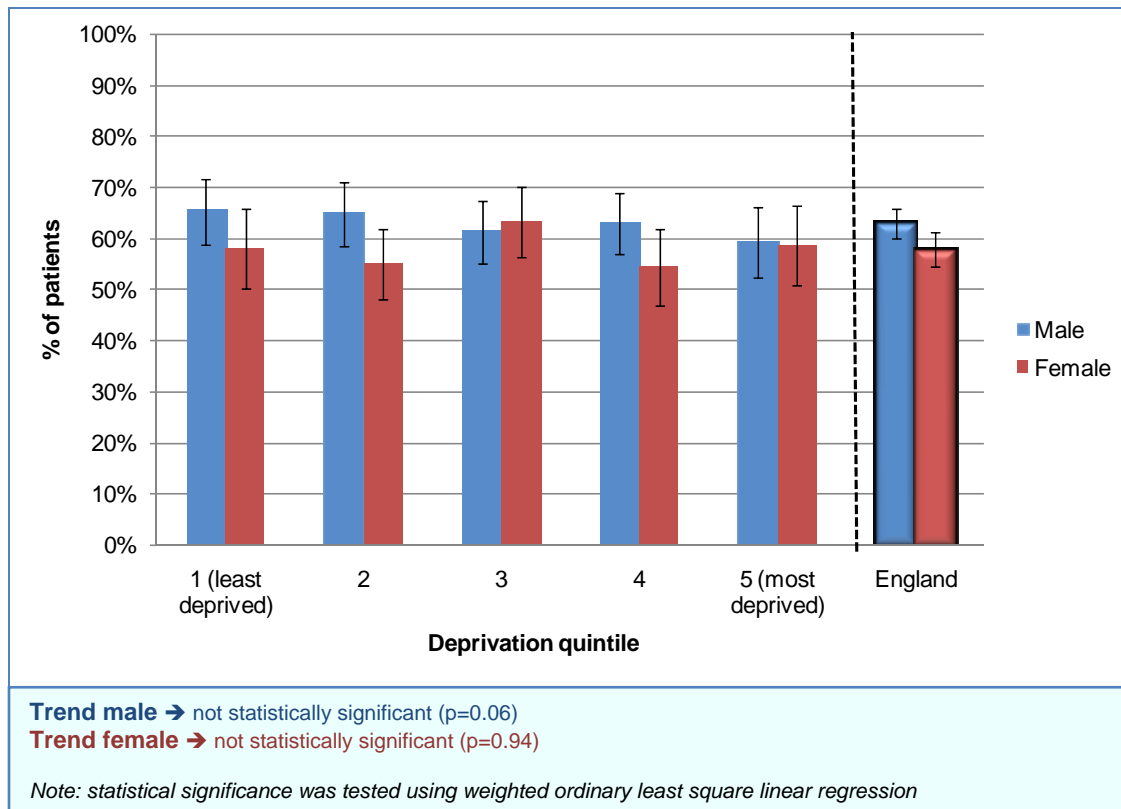


**Table 3.6.2** Major salivary gland cancers – major surgical resections by deprivation quintile and sex

Deprivation Quintile*	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
1	208	65.4%	58.7% - 71.5%	153	58.2%	50.2% - 65.7%	361	62.3%	57.2% - 67.2%
2	220	65.0%	58.5% - 71.0%	189	55.0%	47.9% - 61.9%	409	60.4%	55.6% - 65.0%
3	236	61.4%	55.1% - 67.4%	178	63.5%	56.2% - 70.2%	414	62.3%	57.6% - 66.9%
4	241	63.1%	56.8% - 68.9%	167	54.5%	46.9% - 61.9%	408	59.6%	54.7% - 64.2%
5	190	59.5%	52.4% - 66.2%	153	58.8%	50.9% - 66.3%	343	59.2%	53.9% - 64.3%
<b>England</b>	<b>1,095</b>	<b>62.9%</b>	<b>60.0% - 65.7%</b>	<b>840</b>	<b>58.0%</b>	<b>54.6% - 61.3%</b>	<b>1,935</b>	<b>60.8%</b>	<b>58.6% - 62.9%</b>

\* where Quintile 1 is least deprived and Quintile 5 is most deprived; ‡ MSR - Major Surgical Resections

**Figure 3.6.2** Major salivary gland cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by deprivation quintile and sex



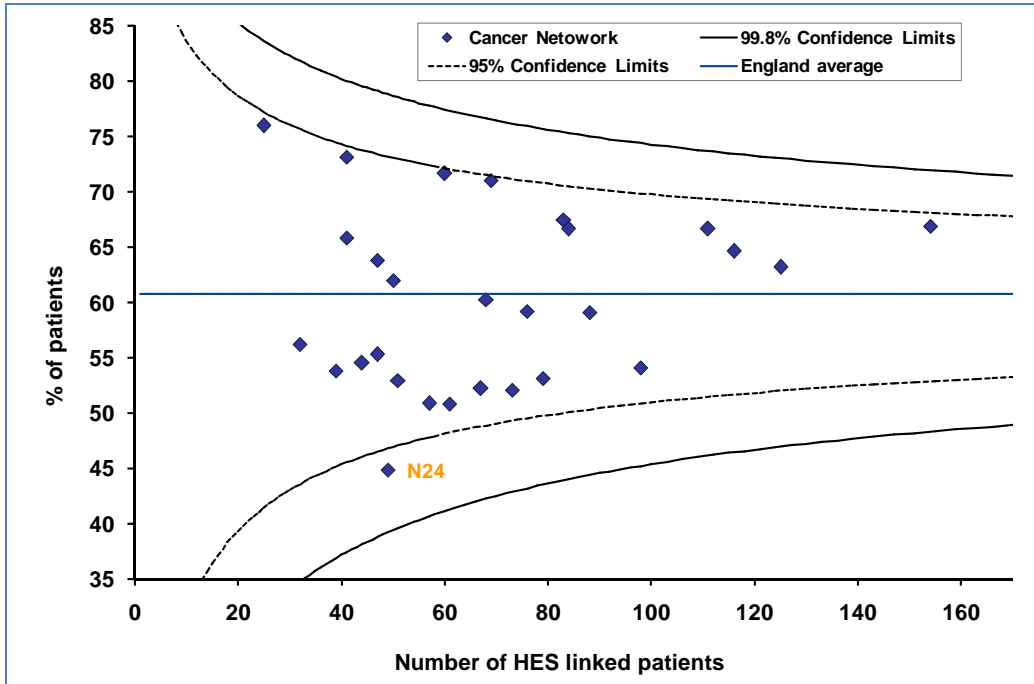
**Table 3.6.3** Major salivary gland cancers – major surgical resections by Cancer Network and sex

Cancer Network	Male			Female			Persons		
	HES linked patients	% MSR‡	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals	HES linked patients	% MSR	95% Confidence Intervals
N01 Lancashire and South Cumbria	39	53.8%	38.6% - 68.4%	28	50.0%	32.6% - 67.4%	67	52.2%	40.5% - 63.7%
N02 Greater Manchester and Cheshire	61	68.9%	56.4% - 79.1%	50	64.0%	50.1% - 75.9%	111	66.7%	57.5% - 74.7%
N03 Merseyside and Cheshire	53	67.9%	54.5% - 78.9%	31	64.5%	46.9% - 78.9%	84	66.7%	56.1% - 75.8%
N06 Yorkshire	38	50.0%	34.8% - 65.2%	41	56.1%	41.0% - 70.1%	79	53.2%	42.3% - 63.8%
N07 Humber and Yorkshire Coast	21	71.4%	50.0% - 86.2%	20	60.0%	38.7% - 78.1%	41	65.9%	50.5% - 78.4%
N08 North Trent	43	76.7%	62.3% - 86.8%	26	61.5%	42.5% - 77.6%	69	71.0%	59.4% - 80.4%
N11 Pan Birmingham	31	54.8%	37.8% - 70.8%	30	46.7%	30.2% - 63.9%	61	50.8%	38.6% - 62.9%
N12 Arden	27	70.4%	51.5% - 84.1%	14	78.6%	52.4% - 92.4%	41	73.2%	58.1% - 84.3%
N20 Mount Vernon	28	60.7%	42.4% - 76.4%	23	43.5%	25.6% - 63.2%	51	52.9%	39.5% - 65.9%
N21 West London	19	63.2%	41.0% - 80.9%	20	45.0%	25.8% - 65.8%	39	53.8%	38.6% - 68.4%
N22 North London	26	61.5%	42.5% - 77.6%	21	66.7%	45.4% - 82.8%	47	63.8%	49.5% - 76.0%
N23 North East London	20	50.0%	29.9% - 70.1%	12	66.7%	39.1% - 86.2%	32	56.3%	39.3% - 71.8%
N24 South East London	25	56.0%	37.1% - 73.3%	24	33.3%	18.0% - 53.3%	49	44.9%	31.9% - 58.7%
N25 South West London	34	82.4%	66.5% - 91.7%	26	57.7%	38.9% - 74.5%	60	71.7%	59.2% - 81.5%
N26 Peninsula	57	52.6%	39.9% - 65.0%	41	56.1%	41.0% - 70.1%	98	54.1%	44.2% - 63.6%
N27 Dorset	27	59.3%	40.7% - 75.5%	20	50.0%	29.9% - 70.1%	47	55.3%	41.2% - 68.6%
N28 Avon, Somerset and Wiltshire	51	72.5%	59.1% - 82.9%	32	59.4%	42.3% - 74.5%	83	67.5%	56.8% - 76.6%
N29 3 Counties	24	66.7%	46.7% - 82.0%	20	40.0%	21.9% - 61.3%	44	54.5%	40.1% - 68.3%
N30 Thames Valley	46	56.5%	42.2% - 69.8%	30	63.3%	45.5% - 78.1%	76	59.2%	48.0% - 69.6%
N31 Central South Coast	51	62.7%	49.0% - 74.7%	37	54.1%	38.4% - 69.0%	88	59.1%	48.6% - 68.8%
N32 Surrey, West Sussex and Hampshire	15	66.7%	41.7% - 84.8%	10	90.0%	59.6% - 98.2%	25	76.0%	56.6% - 88.5%
N33 Sussex	43	65.1%	50.2% - 77.6%	25	52.0%	33.5% - 70.0%	68	60.3%	48.4% - 71.1%
N34 Kent and Medway	35	45.7%	30.5% - 61.8%	22	59.1%	38.7% - 76.7%	57	50.9%	38.3% - 63.4%
N35 Greater Midlands	39	53.8%	38.6% - 68.4%	34	50.0%	34.1% - 65.9%	73	52.1%	40.8% - 63.1%
N36 North of England	61	70.5%	58.1% - 80.4%	64	56.3%	44.1% - 67.7%	125	63.2%	54.5% - 71.1%
N37 Anglia	61	63.9%	51.4% - 74.8%	55	65.5%	52.3% - 76.6%	116	64.7%	55.6% - 72.8%
N38 Essex	34	55.9%	39.5% - 71.1%	16	75.0%	50.5% - 89.8%	50	62.0%	48.2% - 74.1%
N39 East Midlands	86	66.3%	55.8% - 75.4%	68	67.6%	55.8% - 77.6%	154	66.9%	59.1% - 73.8%
<b>England</b>	<b>1,095</b>	<b>62.9%</b>	<b>60.0% - 65.7%</b>	<b>840</b>	<b>58.0%</b>	<b>54.6% - 61.3%</b>	<b>1,935</b>	<b>60.8%</b>	<b>58.6% - 62.9%</b>

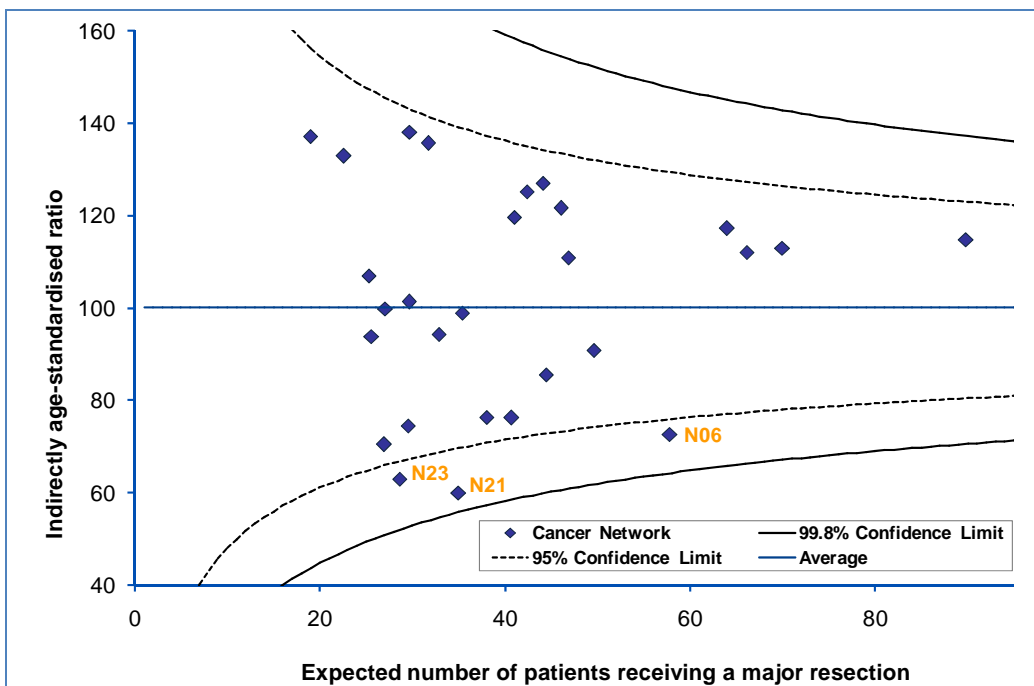
‡ MSR - Major Surgical Resections

The percentage of major surgical resections performed for each Cancer Network has been compared with the England average using funnel plots and confidence limits for all anatomic sites. The England average represents the expected patients with a record of major surgical resection. In interpreting those Networks lying outside the funnel the cautionary caveats listed in the introduction to this section should be heeded. For more information on funnel plots and their use see Appendix 4.

**Figures 3.6.3** Major salivary gland cancers – percentage of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



**Figures 3.6.4** Major salivary gland cancers – indirectly age-standardised ratio<sup>^</sup> of patients treated in NHS hospitals with a record of a major surgical resection by Cancer Network



<sup>^</sup>actual number of patients treated in NHS hospitals with a record of major surgical resection divided by expected number

## Summary

- ❖ For major salivary gland cancers diagnosed in England between 2004 and 2008, the percentage of patients (all ages) with a record of major surgical resection was lower for females (58.0%) than for males (62.9%). This difference, however, was not statistically significant.
- ❖ Females had a lower percentage of major surgical resections for four out of the six age bands examined. However, the difference in the percentage of major surgical resections between females and males was only statistically significant for patients aged 80 and older.
- ❖ For older age groups, there was a decrease in the percentage of salivary gland cancer patients with a record of surgical major resection. For patients aged 80 years and over, 45.1% had a record of major surgical resection compared to – for example – 60.0% for 70-79 olds and 70.0% for patients younger than 40 years of age. The low percentage recorded for the 80 and plus age group was significantly different from all other age bands examined.
- ❖ The percentage of major surgical resection did not significantly vary across the deprivation quintiles for males and females.
- ❖ Using funnel plots and 95% confidence limits only 1 Cancer Network had a percentage of major resections significantly different from the average for England. For age-standardised ratios, 3 Cancer Networks were significantly lower than the 95% confidence limits. All Cancer Networks were within the 99.8% confidence limits for percentage of major resections and age-standardised ratios.

## Appendix 1: ICD-10 codes and site groupings

Site group	ICD-10 code	Code description
Oral Cavity	C00.3	Lip, inner aspect, mucosa of upper
	C00.4	Lip, inner aspect, mucosa of lower
	C06.0	Cheek mucosa
	C06.1	Mouth, vestibule (buccal sulcus and labial)
	C06.2	Retromolar trigone
	C03.0	Gum, upper (alveolar ridge, mucosa, gingiva)
	C03.1	Gum, lower (alveolar ridge, mucosa, gingiva)
	C04.0	Mouth, anterior floor
	C04.1	Mouth, lateral floor
	C04.8	Mouth, floor, overlapping lesion
	C05.0	Palate, hard
	C02.0	Tongue, dorsal surface, anterior 2/3
	C02.1	Tongue, lateral border, tip of tongue
	C02.2	Tongue, ventral, inferior surface
	C02.8	Tongue, overlapping lesion of anterior two-thirds
	C02.3	Anterior two-thirds of tongue, part unspecified
	C06.8	Overlapping lesion of other and unspecified parts of mouth
	C02.4	Lingual tonsil (previously in oropharynx)
Oropharynx	C09.0	Tonsillar fossa
	C09.1	Tonsillar pillar, glossotonsillar sulcus
	C09.9	Tonsil, not otherwise specified
	C10.2	Lateral wall oropharynx
	C01	Base of tongue
	C10.0	Vallecula (Anterior surface epiglottis – see supraglottic larynx)
	C10.3	Posterior wall oropharynx
	C05.1	Palate, soft, inferior surface
	C05.2	Uvula
	C05.8	Overlapping lesion palate
	C10.8	Overlapping lesion of oropharynx
C10.9	Oropharynx unspecified	
Hypopharynx	C12.x or C12.9	Pyriform sinus
	C13.0	Postcricoid region
	C13.1	Aryepiglottic fold, hypopharyngeal aspect
	C13.2	Hypopharynx, posterior wall
	C13.8	Hypopharynx, overlapping lesion
	C13.9	Hypopharynx unspecified
Larynx	C32.1	Supraglottis
	C10.1	Anterior surface epiglottis
	C32.0	Glottis
	C32.9	Larynx, not otherwise specified
	C32.2	Subglottis
	C32.3	Laryngeal cartilage
Major salivary gland	C07.x or C07.9	Parotid gland
	C08.0	Submandibular, submaxillary gland
	C08.1	Sublingual gland

## Appendix 2: DAHNO and OPCS4 codes assigned as major surgical resections

DAHNO codes	OPCS4 codes	Description
0204	E19.1;E29.1;E21.4	Laryngo-pharyngectomy-Primary closure
0205	E19.1;E29.1;G03.2	Laryngo-pharyngectomy-free jejunum
0206	E19.1;E29.1;E21.4;S17.1;Y61.2	Laryngo-pharyngectomy-pect major
0207	E19.1;E29.1;G02.1	Total L-p-oesophagectomy + pullup
0203	E19.2	Pharyngectomy - partial
0201	E23.1	Pharyngotomy (open excision lesion)
0420a	F20.2	Excision of lesion of gingiva
0420	F22.1	Total glossectomy
0419	F22.2	Partial glossectomy
0431	F30.1	Repair of palate using palatal flap
0433	F30.3	Repair of palate using tongue flap
0435	F30.4	Repair of palate using skin graft
0434	F30.5	Repair of palate using mucosal flap
0429	F32.4	Palatectomy (partial) uvulectomy
0430	F32.8;Y05.1	Palatectomy - total
0408	F34.9*	Tonsillectomy-unilateral
0405	F38.1	Floor of mouth excision
0406	F38.2	Buccal mucosa excision
0409	F39.1	Reconstruction mouth - with flap
0410	F39.1	Reconstruction mouth - with primary closure
0411	F39.1;S28.8	Reconstruction mouth - with buccal flap
0412	F39.1;S17.1;Y61.2	Reconstruction mouth - with pectoralis major
0413	F39.1;S20.8;Y59.2	Reconstruction mouth - with radial forearm
0414	F39.2;S35.3	Reconstruction mouth with SSG
0604	F44.1	Parotidectomy - total
0603	F44.2	parotidectomy - superficial
0421	S17.1;Y61.2	Pectoralis major - skin and muscle
0421B	S17.1;Y63.8	Pectoralis major - muscle
0422	S17.1;Y63.1	Latissimusdorsi - skin and muscle
0422B	S17.1;Y63.1	Latissimusdorsi - muscle
0423	S20.8;Y59.2	Radial forearm fasciocutaneous
0301	T85.1	Neck dissection radical
0302	T85.1	Neck dissection modified
0303	T85.1	Modified Type I accessory preserved
0304	T85.1	Modified Type II accessory + IJV kept
0305	T85.1	Modified Type III sternomastoid - IJV + accessory kept
0307	T85.1	Selective neck dissection (SND)
0308	T85.1	SND Level 1 (suprahyoid)
0309	T85.1	SND Level 1-3 (supra omohyoid)
0310	T85.1	SND Level 1-4 (anterolateral)
0311	T85.1	SND Level 2-4 (lateral)
0312	T85.1	SND Level 5 (posterior)
0313	T85.1	SND Level 2-5 (posterolateral)



DAHNO codes	OPCS4 codes	Description
0314	T85.1	SND Level 6 (central compartment)
0315	T85.1	SND Level 7 (superior mediastinum)
0418	V14.1	Hemimandibulectomy
0418B	V14.2	Mandibulectomy - extensive
0417	V14.3	Marginal mandibulectomy
0415	V14.4	Excision lesion jaw NEC*
0416	V16.8	Mandibulotomy/split/division of jaw
0424	V19.1;Y66.2	Reconstruction mandible
0425	V19.1;Y66.2	Reconstruction mandible - with rib
0426	V19.1;Y66.4;Y59.2	Reconstruction mandible - with radius
0427	V19.1;Y66.6;Y59.8	Reconstruction mandible - with fibula
0428	V19.1;Y66.3;Y59.8	Reconstruction mandible - with iliac crest
0101	E34.1	Microlaryngoscopy - laser removal lesion
0102	E34.2	Microlaryngoscopy - cold removal lesion
0103	E29.3	Vertical hemilaryngectomy
0104	E29.2	Supraglotticlaryngectomy
0105	E30.1	Laryngofissure
0106	E29.5	Laryngofissure and cordectomy
0107	E29.1	Total laryngectomy
0108	E41.4	Tracheo-oesophageal puncture with insertion of speech prosthesis
	F01.1	Partial excision of lip/shave/vermillion adv
	F01.8	Wedge resection of lip
	F04.2; S24.8	Reconstruction lip with skin flap (ABBE)

\* For oropharynx Tonsillectomy-unilateral only included if carried out together with other major surgical procedure(s)

### Appendix 3: Percentage of cancer registrations linked to HES records by cancer site and Cancer Network – patients diagnosed between 2004 and 2008 with HES up to 2009

	HYPOPHARYNX	LARYNX	MAJOR SALIVARY GLAND	ORAL CAVITY	OROPHARYNX
N01 Lancashire and South Cumbria	100.0%	95.5%	91.8%	91.3%	96.8%
N02 Greater Manchester and Cheshire	94.5%	85.5%	84.1%	90.5%	93.1%
N03 Merseyside and Cheshire	95.2%	92.9%	82.4%	94.6%	95.8%
N06 Yorkshire	98.2%	93.8%	84.0%	94.6%	96.0%
N07 Humber and Yorkshire Coast	93.8%	95.9%	89.1%	96.3%	98.0%
N08 North Trent	100.0%	93.5%	93.2%	96.3%	96.0%
N11 Pan Birmingham	98.8%	92.4%	77.2%	92.1%	96.4%
N12 Arden	97.7%	95.5%	87.2%	92.6%	93.6%
N20 Mount Vernon	92.0%	93.5%	83.6%	89.9%	86.0%
N21 West London	98.2%	88.5%	76.5%	86.8%	95.3%
N22 North London	93.9%	82.3%	77.0%	85.7%	90.4%
N23 North East London	100.0%	84.7%	72.7%	90.8%	92.5%
N24 South East London	96.2%	84.2%	81.7%	92.1%	94.0%
N25 South West London	100.0%	79.0%	84.5%	82.4%	93.6%
N26 Peninsula	98.0%	94.2%	87.5%	94.2%	96.4%
N27 Dorset	93.8%	90.8%	87.0%	89.9%	96.2%
N28 Avon, Somerset and Wiltshire	100.0%	93.8%	82.2%	94.8%	97.1%
N29 3 Counties	100.0%	91.7%	88.0%	91.6%	94.3%
N30 Thames Valley	98.1%	84.2%	74.5%	92.5%	95.3%
N31 Central South Coast	100.0%	92.7%	88.0%	95.8%	93.5%
N32 Surrey, West Sussex and Hampshire	96.7%	83.4%	71.4%	86.9%	82.5%
N33 Sussex	97.1%	88.6%	81.0%	83.3%	94.2%
N34 Kent and Medway	90.9%	87.3%	81.4%	89.1%	89.8%
N35 Greater Midlands	94.1%	89.4%	84.9%	94.6%	94.2%
N36 North of England	98.1%	97.7%	89.3%	95.1%	97.6%
N37 Anglia	96.4%	91.3%	85.9%	91.4%	93.8%
N38 Essex	92.7%	95.0%	75.8%	90.4%	96.2%
N39 East Midlands	96.7%	92.4%	86.5%	94.3%	97.4%
<b>England</b>	<b>97.0%</b>	<b>90.9%</b>	<b>83.8%</b>	<b>92.1%</b>	<b>94.7%</b>

## Appendix 4: Data analysis – further information

### Funnel Plots

Funnel plots are recommended as a graphical aid for institutional comparisons, in which an estimate of an underlying quantity is plotted against an interpretable measure of its precision. Therefore, a funnel plot is a scatter plot of observed indicators against a measure of its precision, typically the sample size. Funnel plots allow many points to be plotted simultaneously, with information about whether each point is significantly above or below the expected, or average, value. Control limits are set at 95% (2 standard deviations) and 99.8% (3 standard deviations) levels that narrow as the sample size gets bigger. Any observation outside the control limits can be considered to be significantly below or above the expected, or average, value. In the absence of bias and between institutional heterogeneity, the scatter will be due to sampling variation alone and the plot will resemble a symmetrical funnel. Some further information on funnel plots can be obtained from <http://www.apho.org.uk/resource/item.aspx?RID=39445>.

### Indirectly age-standardised ratios

The statistic most commonly presented for the indirect method of age standardisation is the standardised ratio. This is the ratio of the observed number of events relative to the number of events that would be expected if standard age-specific rates were applied to the particular observed population's age structure. The indirectly standardised ratio (ISR) is given by:

$$ISR = \frac{O}{E} = \frac{\sum_i O_i}{\sum_i E_i} = \frac{\sum_i O_i}{\sum_i n_i \lambda_i}$$

where:

$O$  is the total observed number of events in the local or subject population;

$E$  is the total number of expected events in the local or subject population, given the standard rates  $\lambda_i$  in the reference or standard population;

$O_i$  is the observed numbers of events in the local or subject population in age group  $i$ ;

$E_i$  is the expected number of events in the local or subject population in age group  $i$ , given the standard rate  $\lambda_i$  in the reference or standard population;

$n_i$  is the number of individuals in the local or subject population in age group  $i$ ;

$\lambda_i$  is the crude age-specific rate in the reference or standard population in age group  $i$ .

The  $100(1-\alpha)\%$  confidence limits for the indirectly standardised ratio (ISR) are given by:

$$ISR_{lower} = \frac{O_{lower}}{E} \quad ISR_{upper} = \frac{O_{upper}}{E}$$

where:

$O_{lower}$  and  $O_{upper}$  are the lower and upper confidence limits for the observed number of events.

Using Byar's method, the  $100(1-\alpha)\%$  confidence limits for the observed number of events are given by:

$$O_{lower} = O \times \left( 1 - \frac{1}{9O} - \frac{z}{3\sqrt{O}} \right)^3 \quad O_{upper} = (O+1) \times \left( 1 - \frac{1}{9(O+1)} + \frac{z}{3\sqrt{(O+1)}} \right)^3$$

where:

$z$  is the  $100(1-\alpha/2)$ th percentile value from the Standard Normal distribution. For example, for a 95% confidence interval,  $\alpha = 0.05$  and  $z = 1.96$  (i.e. the 97.5th percentile value from the Standard Normal distribution).

### 95% confidence intervals for percentages

For the percentages, 95% confidence intervals are given calculated using the Wilson Score Method. These are a measure of variability in the percentages calculated using the sample size. The upper and lower limits of the confidence interval show how big a contribution chance may have made to a particular statistic. The 95% confidence intervals quoted give the range in which the rate in question would fall 19 times out of 20, were it possible to repeat the analyses.

Using the Wilson Score method, the  $100(1-\alpha)\%$  confidence limits for the proportion (percentages)  $p$  are given by:

$$p_{lower} = \frac{(2O + z^2 - z\sqrt{z^2 + 4Oq})}{2(n + z^2)} \quad p_{upper} = \frac{(2O + z^2 + z\sqrt{z^2 + 4Oq})}{2(n + z^2)}$$

where:

$q$  is  $1-p$ ;

$z$  is the  $100(1-\alpha/2)$ th percentile value from the Standard Normal distribution. For example, for a 95% confidence interval,  $\alpha = 0.05$  and  $z = 1.96$  (i.e. the 97.5th percentile value from the Standard Normal distribution).



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