Mount Vernon Cancer Network

A NETWORK'S EXPERIENCE OF USING DATA TO BETTER UNDERSTAND VARIANCE AND IMPROVE OUTCOMES IN LUNG CANCER

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Mount Vernon Cancer Network has a population of 1.3m residents. It encompasses NHS Hertfordshire, NHS Luton and southern part of NHS Bedfordshire and Provider Trusts: East & North Hertfordshire NHS Trust, West Hertfordshire NHS Trust as well as Luton and Dunstable NHS Foundation Trust.

In line with the Cancer Reform Strategy³ recommendations, Mount Vernon Cancer Network and its constituent Lung Cancer Tumour Site Specialised Group (TSSG) have reviewed various sources of information since 2008 to ascertain where the network was ranked in terms of outcomes and aspects of service delivery. These sources included:

1. eAtlas² survival data

- 2. Cancer Commissioning Tool kit⁴
- 3. National Lung Cancer Audit⁵

These indicated that the network was in the 4th quartile for certain measures and highlighted the need for further in-depth review of information pertaining to lung cancer service provision such as diagnoses rates, staging and active treatment rates.^{5,6}

Working with the local cancer registry, Eastern Cancer Registration and Information Centre (ECRIC). The network has been able to review more up to date data for the registered lung cancer population over the time period 2007 to 2008.

Number New Cases: C33-C34: Trachea, bronchus and lung - Persons: NCIN 2005

New Cancer cases, crude and age-standardised* incidence rates per 100,000 (with 95% confidence intervals), Cancer Networks, UK, 2005¹

Trachea, bronchus and lung



 Mount Vermon & Surrounding Cancer Networks with PCT Boundaries
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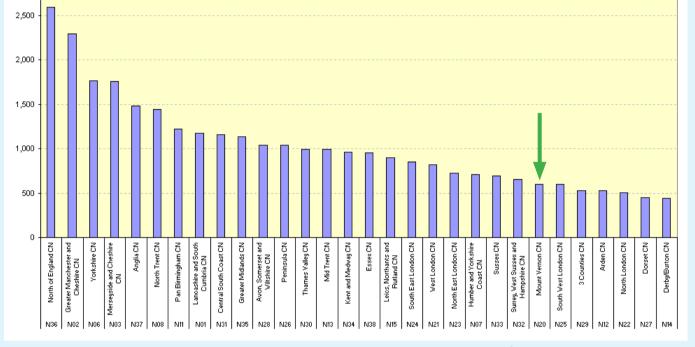
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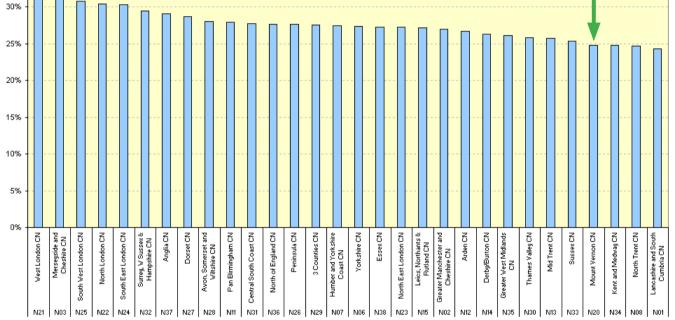
Relative 1-Year Survival Rates in Lung Cancer (2001-2005); Northern & Yorkshire Cancer Registry & Information Service 2008²

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Mount Vernon Cancer Network has a lower than average incidence rate of 51.8 per 100,000,¹ and is ranked as 24th in terms of networks ordered according to the highest number of new cases with the primary cancer located in either the trachea, bronchus and lung (C33-34).

| Cancer Network | Number of cases | Crude rate | ASR | 95% conf inter | | Number of cases | Crude rate | ASR | 95% conf inter | | Number of cases | Crude rate | ASR | 95% coni inter | |
|--|--------------------|---------------|------|-------------------|------|--------------------|---------------|------|-------------------|------|--------------------|---------------|------|-------------------|------|
| N01 Lancashire and South Cumbria CN | 666 | 85.0 | 65.6 | 60.5 - | 70.7 | 504 | 61.1 | 39.5 | 35.8 - | 43.2 | 1,170 | 72.8 | 52.6 | 49.4 - | 55.7 |
| N02 Greater Manchester and Cheshire CN | 1,317 | 89.0 | 77.7 | 73.4 - | 81.9 | 974 | 63.3 | 45.4 | 42.4 - | 48.4 | 2,291 | 75.9 | 61.5 | 58.9 - | 64.1 |
| N03 Merseyside and Cheshire CN | 921 | 100.1 | 79.3 | 74.1 - | 84.5 | 837 | 84.4 | 57.1 | 53.0 - | 61.3 | 1,758 | 92.0 | 68.2 | 64.9 - | 71.5 |
| ND6 Yorkshire CN | 964 | 76.4 | 64.5 | 60.4 - | 68.7 | 800 | 60.0 | 43.0 | 39.8 - | 46.1 | 1,764 | 68.0 | 53.7 | 51.1 - | 56.4 |
| N07 Humber and Yorkshire Coast CN | 407 | 80.4 | 59.3 | 53.5 - | 65.2 | 300 | 56.8 | 36.8 | 32.4 - | 41.3 | 707 | 68.4 | 48.1 | 44.4 - | 51.7 |
| N08 North Trent CN | 830 | 96.2 | 75.8 | 70.6 - | 81.1 | 610 | 68.0 | 44.1 | 40.4 - | 47.8 | 1,440 | 81.8 | 59.9 | 56.7 - | 63.2 |
| N11 Pan Birmingham CN | 756 | 82.1 | 72.5 | 67.2 - | 77.7 | 462 | 47.9 | 35.4 | 32.0 - | 38.9 | 1,218 | 64.6 | 53.9 | 50.8 - | 57.1 |
| N12 Arden CN | 315 | 63.9 | 51.4 | 45.6 - | 57.2 | 210 | 41.8 | 28.5 | 24.4 - | 32.6 | 525 | 52.7 | 40.0 | 36.4 - | 43.5 |
| N13 Mid Trent CN | 608 | 76.8 | 57.4 | 52.8 - | 62.1 | 382 | 46.7 | 31.4 | 28.1 - | 34.8 | 990 | 61.5 | 44.4 | 41.6 - | 47.3 |
| N14 Derby/Burton CN | 259 | 76.1 | 62.1 | 54.4 - | 69.8 | 181 | 51.8 | 33.9 | 28.6 - | 39.2 | 440 | 63.8 | 48.0 | 43.3 - | 52.7 |
| N15 Leics, Northants and Rutland CN | 542 | 68.9 | 59.1 | 54.1 - | 64.2 | 358 | 44.4 | 31.5 | 28.1 - | 35.0 | 900 | 56.5 | 45.3 | 42.3 - | 48.4 |
| N20 Mount Vernon CN | 338 | 59.2 | 50.4 | 44.9 - | 55.9 | 264 | 44.7 | 32.5 | 28.4 - | 36.7 | 602 | 51.8 | 41.5 | 38.0 - | 44.9 |
| N21 West London CN | 447 | 48.9 | 53.9 | 48.8 - | 58.9 | 368 | 40.0 | 35.3 | 31.5 - | 39.1 | 815 | 44.4 | 44.6 | 41.4 - | 47.8 |
| N22 North London CN | 305 | 50.5 | 56.6 | 50.1 - | 63.0 | 201 | 32.2 | 29.6 | 25.2 - | 33.9 | 506 | 41.2 | 43.1 | 39.2 - | 47.0 |
| N23 North East London CN | 434 | 57.1 | 63.8 | 57.7 - | 70.0 | 293 | 38.0 | 32.5 | 28.5 - | 36.4 | 727 | 47.5 | 48.2 | 44.5 - | 51.8 |
| N24 South East London CN | 480 | 64.2 | 68.5 | 62.2 - | 74.7 | 372 | 48.5 | 41.9 | 37.3 - | 46.4 | 852 | 56.3 | 55.2 | 51.3 - | 59.0 |
| N25 South West London CN | 345 | 53.2 | 56.9 | 50.8 - | 63.0 | 257 | 38.2 | 33.2 | 28.9 - | 37.6 | 602 | 45.6 | 45.1 | 41.3 - | 48.8 |
| N26 Peninsula CN | 625 | 79.5 | 52.3 | 48.1 - | 56.6 | 412 | 49.5 | 28.5 | 25.5 - | 31.5 | 1,037 | 64.0 | 40.4 | 37.8 - | 43.0 |
| N27 Dorset CN | 255 | 75.4 | 44.7 | 39.0 - | 50.5 | 196 | 54.1 | 30.4 | 25.7 - | 35.1 | 451 | 64.4 | 37.6 | 33.8 - | 41.3 |
| N28 Avon, Somerset and Wiltshire CN | 630 | 69.6 | 52.8 | 48.6 - | 57.1 | 409 | 43.5 | 28.2 | 25.2 - | 31.1 | 1,039 | 56.3 | 40.5 | 37.9 - | 43.1 |
| N29 3 Counties CN | 317 | 62.6 | 44.5 | 39.4 - | 49.5 | 210 | 39.8 | 24.4 | 20.9 - | 28.0 | 527 | 50.9 | 34.5 | 31.4 - | 37.5 |
| N30 Thames Valley CN | 606 | 52.6 | 48.6 | 44.7 - | 52.6 | 390 | 33.5 | 25.4 | 22.7 - | 28.0 | 996 | 43.0 | 37.0 | 34.6 - | 39.4 |
| N31 Central South Coast CN | 675 | 70.8 | 52.3 | 48.3 - | 56.3 | 483 | 48.7 | 31.1 | 28.1 - | 34.1 | 1,158 | 59.5 | 41.7 | 39.2 - | 44.2 |
| N32 Surrey, West Sussex and Hampshire CN | 371 | 52.3 | 41.7 | 37.3 - | 46.0 | 280 | 38.0 | 25.8 | 22.6 - | 29.1 | 651 | 45.0 | 33.8 | 31.0 - | 36.5 |
| N33 Sussex CN | 418 | 79.6 | 51.5 | 46.3 - | 56.7 | 277 | 48.7 | 27.3 | 23.7 - | 31.0 | 695 | 63.5 | 39.4 | 36.2 - | 42.6 |
| N34 Kent and Medway CN | 551 | 70.3 | 55.4 | 50.7 - | 60.1 | 407 | 49.3 | 32.1 | 28.8 - | 35.5 | 958 | 59.5 | 43.8 | 40.9 - | 46.6 |
| N35 Greater Midlands CN | 703 | 76.1 | 57.6 | 53.3 - | 62.0 | 430 | 45.1 | 30.3 | 27.3 - | 33.3 | 1,133 | 60.3 | 44.0 | 41.3 - | 46.6 |
| N36 North of England CN | 1,445 | 99.3 | 77.3 | 73.3 - | 81.4 | 1,144 | 74.7 | 48.8 | 45.8 - | 51.8 | 2,589 | 86.7 | 63.1 | 60.5 - | 65.6 |
| N37 Anglia CN | 905 | 69.8 | 50.9 | 47.5 - | 54.3 | 577 | 43.2 | 28.5 | 26.0 - | 31.0 | 1,482 | 56.3 | 39.7 | 37.6 - | 41.8 |
| N38 Essex CN | 549 | 66.2 | 51.0 | 46.6 - | 55.3 | 403 | 46.3 | 30.6 | 27.4 - | 33.7 | 952 | 56.0 | 40.8 | 38.1 - | 43.5 |
| England | 17.984 | 73.2 | 59.8 | 59.0 - | 60.7 | 12,991 | 50.9 | 35.2 | 34.5 - | 35.8 | 30,975 | 61.8 | 47.5 | 47.0 - | 48.1 |



A review of relative survival rates in lung cancer indicates that Mount Vernon Cancer Network has a lower than average rate of 24.8%,² and is ranked in the 4th quartile when compared to the other 30 English Cancer Networks.

Approach

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Information about process and clinical measures is available from different data sources^{7,8} and often referring to different time periods. The Lung Cancer TSSG worked closely with its local cancer registry ECRIC to review more up to date and complete information. The intention was to review survival rates and also correlate this with process measures that impact the lung cancer patient care pathway. Working with ECRIC, enabled comparisons to be done between Mount Vernon Cancer Network and the rest of the East of England.⁹

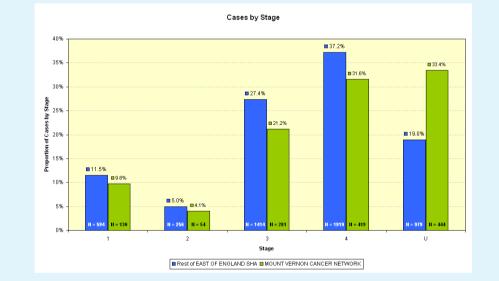
- ECRIC is the regional cancer registry covering the 5.6 million population of the East of England: collects and collates information from over 20 data sources;
- registers all malignant and selected benign tumours diagnosed in the region;
- follows each patient from diagnosis, through the patient pathway, and for their lifetime. Cases registered by ECRIC include data on:
- patient demographics;
- site, behaviour, morphology and stage of tumour;
- treatment, including details of surgery, radiotherapy and chemotherapy;
- hospitals where treated;
- causes of death (both cancer and non-cancer deaths).
- This study used survival analysis by Kaplan Meier and Cox methods.

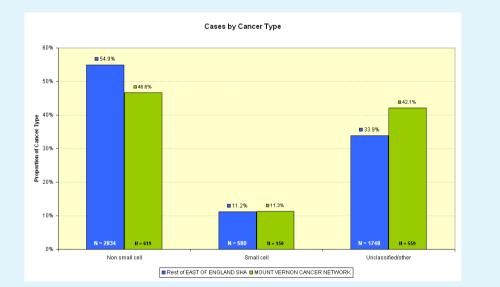
Discussion

- Mount Vernon Cancer Network was found to have a significantly lower 1-year survival rate than
 the rest of the East of England after adjustment for age at diagnosis, stage, grade and deprivation.
 A similar finding was established with 1-year conditional on 3-month survival. These differences
 between the Network and rest of the East of England could indicate that late diagnoses was not
 the only factor explaining the differences as active treatment rates had a key role to play here when
 looking at the impact on survival
- •A review of the distribution of diagnosis by stage indicated that there was a higher proportion of patients at Mount Vernon Cancer Network (around a third) did not have staging information available. Stages 1 to 4 follow the current TNM approach for staging in lung cancer. But the registry also records two additional stages which have included in the stage marked as 'Unknown/ Unclassified' (U): Stage 6 insufficient information to stage the tumour; Stage X tumour site was classified as bronchus or lung unspecified (ICD10 site code C34.9)
- Mount Vernon Cancer Network has a lower proportion of histological and higher proportion of clinical diagnoses than the rest of the East of England. This additional insight into basis of diagnosis

| Cancer Network/Region | One Year Crude Survival | One Year Survival Conditional on 3-month Survival | | |
|-----------------------------|---|--|--|--|
| | Percent One Year Survival (95 | % confidence limits) | | |
| Rest of East of England SHA | 27.7 (26.4, 28.9) | 45.6 (43.8, 47.4) | | |
| | 23.6 (21.4, 26.0) | 42.5 (38.8, 46.1) | | |
| Mount Vernon Cancer Network | HR (compare with rest of East of England; 1.08 (p=0.03) | HR (compare with rest of East of England; 1.10 (p=0.05) | | |

Lung cancer survival (2007/08 diagnoses)

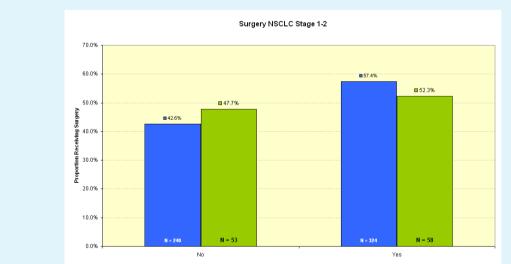




| Type of active treatment | Rest of East of England SHA | | | Mount Vernon Cancer Network | | | |
|---|-----------------------------|-------------------|-----------------------|-----------------------------|-------------------|-----------------------|--|
| | Number Untreated | Number Treated | Percentage Treated | Number Untreated | Number Treated | Percentage Treated | |
| Active treatment (surgery, radiotherapy or chemotherapy | 2178 | 2893 | 57.0% | 763 | 535 | 41.2% | |
| Surgery All NSCLC | 2260 | 574 | 20.3% | 476 | 143 | 23.1% | |
| Radiotherapy All Lung cancers | 3213 | 1949 | 37.8% | 1039 | 289 | 21.8% | |
| Chemotherapy NSCLC Stages 3-4 | 1075 | 778 | 42.0% | 243 | 70 | 22.4% | |
| Chemotherapy Small Cell Lung Cancer | 234 | 346 | 59.7% | 83 | 67 | 44.7% | |
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Reasons for No Active Treatment

| • | Definition | Rest of East of England SHA | | Mount Vernon Cancer Network | |
|---|---------------------------------|--------------------------------|--------|--------------------------------|--------|
| • | Died before treatment was given | 325 | 6.4% | 57 | 4.4% |
| | Refused treatment | 105 | 2.1% | 7 | 0.5% |
| • | Asymptomatic | 48 | 0.9% | 7 | 0.5% |
| | Unfit to treat | 1148 | 22.6% | 439 | 33.8% |
| • | Death certificate only | 0 | 0.0% | 2 | 0.2% |
| • | Post Mortem only | 128 | 2.5% | 25 | 1.9% |
| • | Watch & Wait/Palliative Care | 108 | 2.1% | 91 | 7.0% |
| • | No Record of Treatment | 316 | 6.2% | 1356 | 10.4% |
| | Total | 5071 | 100.0% | 1298 | 100.0% |



does provide a more complete picture than that recorded in the National Lung Cancer Audit (for 2008, the histological diagnosis rate for the Network is 73.1%).¹⁰

•A review of the proportion of non-small cell lung cancer (NSCLC) to small cell lung cancer to unclassified or other types of lung cancer indicated that Mount Vernon Cancer Network has lower proportion of NSCLC and higher proportion of unclassified/other types when compared to the rest of the East of England.

•Active treatment is classified as surgery, radiotherapy or chemotherapy. Mount Vernon Cancer Network has a lower rate of active treatment when compared to the rest of the East of England. The 2008 National Lung Cancer Audit data would complement this analysis further as the distribution of active treatment is provided by age, stage and performance status.¹¹

•Reasons as to why no active treatment was given was further ascertained by the local registry ECRIC by reviewing medical notes. Mount Vernon Cancer Network classified a high proportion of cancers as unfit to treat/watch & wait/palliative care when compared to the rest of the East of England.

•In comparison, Mount Vernon Cancer Network had lower treatment rates (except for surgery of all stages and all lung cancers) than the rest of the East of England. With slightly higher surgery rates being observed for the Network, this raised questions around the distribution of surgery across the stages.

First indications point to:

- despite having higher overall surgery rates in the Network, there are lower rates in Stage 1 and 2 NSCLC

- surgery was also being conducted in both Mount Vernon Cancer Network and the rest of the East of England in patients either with insufficient staging information to record the stage or categorised as bronchus or lung unspecified making it difficult to derive the relevant stage. Within the sector of patients with unknown or unclassified staging, the Network did seem to have a higher surgery rate than the rest of the East of England

- It would seem prudent for a more detailed audit to be conducted around staging and surgery rates, namely, understand the decision making process by clinicians which results in the unknown/unclassified stage being derived from this audit of the registered lung cancer population by ECRIC.

Conclusion

Cancer registry data held by ECRIC is population-based (n = 667 in 2008), while the National Lung Cancer Audit (n = 540 in 2008) is treatment centre-based.

Both sets of data seem to identify Mount Vernon Cancer Network as having notably poor survival,perhaps due to:

- low rates of histological diagnosis and staging;

- high proportions of unclassified tumour types;

- high proportions of untreated cases;

- low rates of chemotherapy, radiotherapy and surgery.

The value of such information only becomes apparent through discussions with the clinicians (TSSG – at their regular review meetings) and ongoing actions that fall out as a result of understanding the data.

For the clinical community to utilise any information about process and clinical measures it needs to be viewed as complete and up to date to reflect clinical practice. This could really only happen by initiating the discussion with the TSSG through use of data in the public domain (e.g., survival rates from the NCIN and process measures from the National Lung Cancer Audit). Additionally, building upon this through detailed work by the local cancer registry to determine what information was held for similar measures. This analysis by the registry was found to complement information recorded in the National Audit, for example, treatment rates were very similar. Furthermore, work the of the registry also helped to ascertain more information as to why non-treatment decisions were made.

The key conclusion is that the local registry's involvement in the work of TSSG's is
paramount to the improvement of clinical outcomes, however, clinical engagement is
essential to make any use/sense of the data published by a National Audit or derived from
the local cancer registry records.

Rest of EAST OF ENGLAND SHA MOUNT VERNON CANCER NETWOR

Surgery rates by stage

| Surgery rates across Stage (Rest of East of England SHA) | Did not | have surgery | S | urgery | |
|---|---------|----------------|---------|----------------|--|
| Stage | Cases | Proportion (%) | Cases | Proportion (%) | |
| 1 | 147 | 37.7% | 243 | 62.3% | |
| 2 | 93 | 53.4% | 81 | 46.6% | |
| 3 | 770 | 89.0% | 95 | 11.0% | |
| 4 | 909 | 92.0% | 79 | 8.0% | |
| U | 341 | 81.8% | 76 | 18.2% | |
| Surgery rates across Stage (Mount Vernon Cancer Network) | Did not | have surgery | Surgery | | |
| Stage | Cases | Proportion (%) | Cases | Proportion (%) | |
| 1 | 30 | 40.5% | 44 | 59.5% | |
| 2 | 23 | 62.2% | 14 | 37.8% | |
| 3 | 112 | 83.0% | 23 | 17.0% | |
| 4 | 169 | 94.9% | 9 | 5.1% | |
| | 142 | 72.8% | 53 | 27.2% | |

Short-term

d clinical measures it needs is could really only happen bublic domain (e.g., survival incer Audit). Additionally, is determine what information to complement information to complement information to complement information to complement decisions
e work of TSSG's is clinical engagement is is inconal Audit or derived from
- The TSSG are reviewing the Network lung cancer treatment protocols.
- Clinicians are also conducting audits within their Trusts data to compare key measures (diagnosis/ treatment rates) at the 4-monthly lung TSSG meetings.
- Present this ongoing work as a case study to the June 2010 NCIN conference of how a Network TSSG utilises information to improve practice – this could form a templated process for other Networks to learn from.
- Continue to work closely with the registry – review more up to date data available online to clinicians.
- Utilise the Peer Review Measures (data completion; histological conformation rate; active treatment rates; surgical resection rates {all cases excluding Mesothelioma}; and small cell lung cancer chemotherapy rates)
Long-term
- Agreement for the Lung TSSG to take part in the current MDT pairing initiative (led by National

Lung Cancer Audit team) – idea is to compare MDT decision making and share learning's.

ICD = International Classification of Diseases; TNM = Tumour/lymph Nodes/Metastases; U = Unknown/Unclassified

References: 1. NCIN. Cancer Incidence and Mortality by Cancer Network, UK, 2005, page 20. 2. At Network level: National Cancer Intelligence Network (NCIN) network figures published on eAtlas; Northern & Yorkshire Cancer Registry & Information Service, 2008; http://www.apho.org.uk/addons/_49908/Excel%20Datasheet.xls 3. Department of Health. Cancer Reform Strategy. London: Department of Health December 2007; http://www.ach.gov.uk/prod_consum_dh/groups/dh_digitalassets/documents/digitalassets/documents/digitalassets/documents/digitalasset/dh_081007.pdf 4. National Cancer Intelligence Network, Cancer Commissioning Toolkit; 2008 https://www.cancertoolkit.co.uk/PublicPages/Login.aspx?ReturnUrl=%2fdefault. aspx&AspxAutoDetectCookieSupport=1 5. The National Lung Cancer Audit, 2009, Information Centre, HQIP, Royal College of Physicians, http://www.ic.nhs.uk/webfiles/Services/NCASP/audits%20and%20reports/IC23090809_NHS_IC_Lung_Cancer_AUDIT_2009_Interactive_for_web.pdf 6. Measures such as Performance Status and Staging; Histological Diagnoses Rates and Active Treatment Rates had increased by 20% to 30% when compared to the previous year. 7. Review of 1- and 3-years survival rates were done initially. This was from the 'Variance in Cancer care' project, which is a joint working agreement between the NCIN, Mount Vernon Cancer Network and Roche Products Ltd. 8. Variety of data reviewed by the TSSG included NHS 'only' access and information in the public domain. 9. ECRIC is the local cancer registry for the other networks in the East of England such as Anglia Cancer Network and Essex Cancer Network and Essex Cancer Network 2009, Information Centre, HQIP, Royal College of Physicians; Page 20 http://www.ic.nhs.uk/services/national-clinical-audit-support-programme-ncasp/audit-reports/lung-cancer_ Mttp://www.ic.nhs.uk/services/NCASP/audits%20and%20reports/IC23090809_NHS_IC_Lung_Cancer_AUDIT_2009_Interactive_for_web.pdf 11. Excel-based data released March 2010; Tabs 8,9, and 10:http://www.ic.nhs.uk/services/national-clinical-audi

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