# SURGERY RATES IN OLDER LUNG CANCER PATIENTS WITH LOW PRE-DIAGNOSIS MORTALITY RISK

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## Background

'Routes from Diagnosis' (RfD) links and analyses routinely collected cancer registry and HES data to map out the cancer journey for whole cohorts of patients over up to 7 years after diagnosis. This approach brings together information on survival, morbidities and demographics, painting a detailed picture of survivorship.

Applying these methods to lung cancer, we aimed to investigate the relationship between surgery rates and age.

## Method

Clinical experts and data analysts collaborated to map out cancer journeys for 21,634 patients diagnosed with lung cancer in England in 2004.

The Charlson Co-Morbidity Index was applied to patients' inpatient HES records, to act as a proxy for pre-diagnosis morbidity. Records were analysed across a 27 month period pre-diagnosis, starting at 30 months pre-diagnosis and ending 3 months pre-diagnosis (as events occurring within 3 months of cancer diagnosis could be cancer-related). 14 groups of inpatient morbidity events were defined and each event had a score assigned to it. In order to ensure that the most meaningful morbidity was presented, the Charlson Index was adapted to include only non-cancer elements.

This produced an adapted Charlson Index score for each patient, ranging from 0 (no significant inpatient morbidity) to a theoretical high of 22 (very high inpatient morbidity). It is important to note that this pre-diagnosis score may not be a full reflection of a patient's pre-diagnosis morbidity given that it is only based on inpatient HES data.

As coding of stage is poor, HES coding of new primary tumours at common metastatic sites for lung cancer and codes relating to ill-defined, secondary and unspecified sites were coded in the RfD data set as metastases. This meant significantly more metastases were captured than would have been the case using NCDR stage at diagnosis alone.

RfD also took into account post-diagnosis morbidities over up to 7 years after diagnosis. A range of health conditions were identified by the clinical advisory group according to the following inclusion criteria: common conditions likely to be more prevalent for people with lung cancer compared with the general population; common conditions likely to affect treatment decisions; or common conditions related to complications or long-term consequences of lung cancer or its treatment. The condition was then included in the analysis if it is recorded in the patient's hospital record (specifically their inpatient Hospital Episode Statistics (HES) entry).

By including only patients with a pre-diagnosis Charlson score of 0, patients with no recorded inpatient morbidities and no recorded metastases, those patients who may be less likely to receive surgery for clinical reasons could be removed from the sample, allowing the relationship between surgery rates and age to be investigated while attempting to control for clinical readiness for surgery.

## Results

Among patients with a Charlson score of 0, no recorded post-diagnosis inpatient morbidities and no recorded metastases, surgery rates were as follows: 14.2% of those aged 25-64; 6.9% of those aged 65-69; 4.6% of those aged 70-74; and 2.1% of those aged 75+ (see also Figure 1).

Patients aged 25-64 were around six times more likely to receive surgery than those aged 75+. There were also large differences between adjacent age brackets: the surgery rate for patients aged 70-74 was more than double that of patients aged 75+.

*Figure 1: RfD: Lung cancer surgery rate by age bracket, among patients with Adapted Charlson score of 0, no metastases, and no post-diagnosis inpatient morbidities*

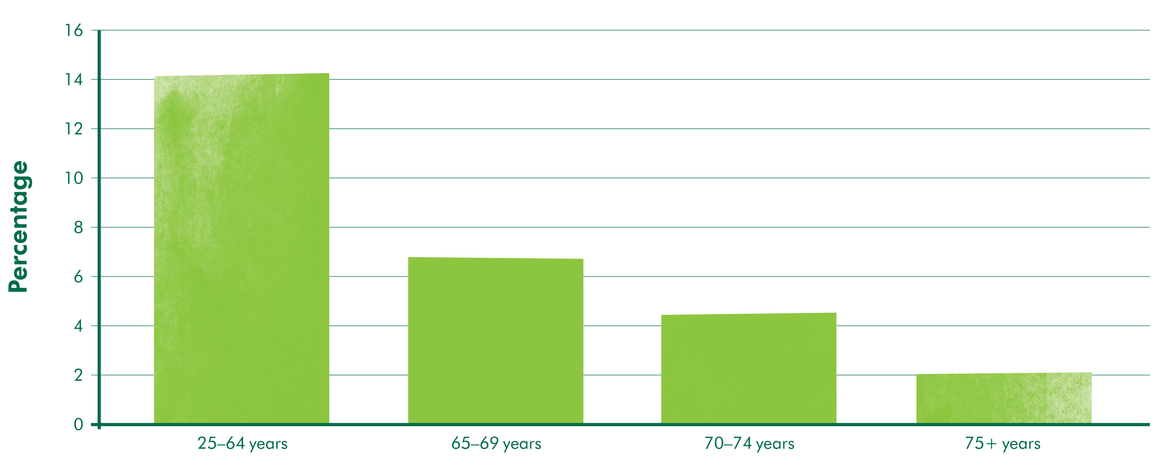


*Figure 2: EUROCARE-5: European highest, lowest and UK & Ireland 5-year lung cancer survival rates vs European average[3]*

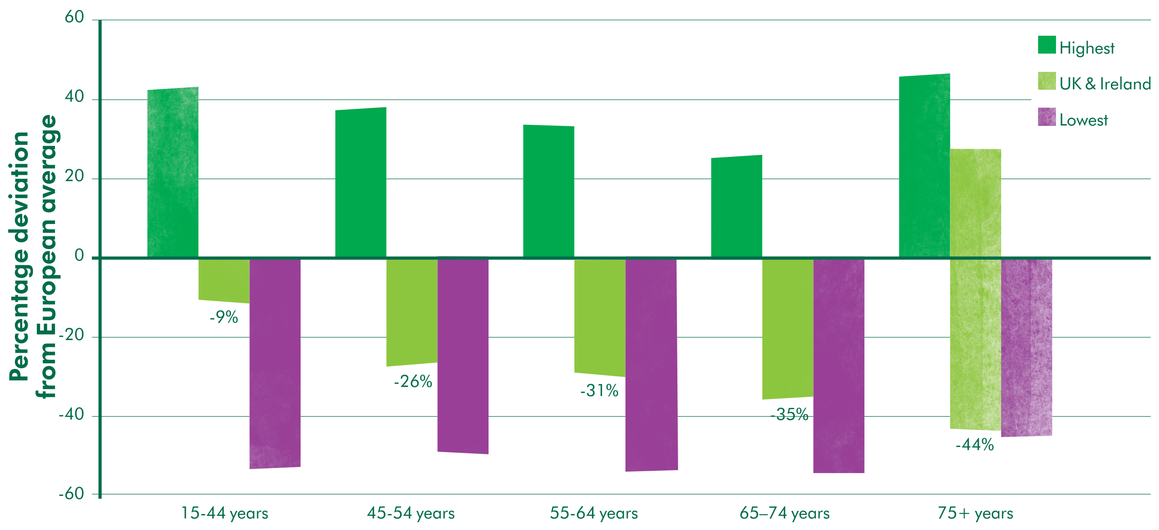


Chart takes the European average for each age bracket as a baseline, and displays percentage deviation from this average. The nation with the highest survival rate differs by age bracket (15-44: Sweden; 45-54 & 55-64: Austria; 65-74: Germany; 75+: Croatia). Bulgaria's survival rate was the lowest in Europe for ages 15-74, and Slovenia for ages 75+.[3]

## Conclusion

The application of a 'Routes from Diagnosis' approach further demonstrates the differences in treatment between age groups, and shows the value of using routinely collected data to understand trends in treatment and outcomes on a large scale.

Previous studies have shown that the survival rate for lung cancer in the UK and Ireland is 9% lower than the European average for adults aged under 45, but 44% lower for those aged 75+ (Figure 2).[1] Under treatment is one of a number of factors contributing to poor cancer survival rates among older people.[2]

During the years since 2004 (when patients in the RfD analysis were diagnosed), lung cancer resection rates have improved, particularly among older patients. Although it is narrowing, a large gap in resection rates between patients aged 70-74 and the oldest age groups remains.[4]

### Lung cancer survival rates: lagging behind Europe

**9%** Lower than European average[3]

**44%** Lower than European average[3]

**Aged <45** **Aged 75+**

*UK and Ireland percentage deviation from the European average for 5-year lung cancer relative survival (European average is 24.3% for ages 15-44; 7.9% for ages 75+).*

**References**

1 Macmillan-NCIN work plan, 'Segmenting the cancer population', 2013
2 Macmillan Cancer Support, *Age Old Excuse: under-treatment of older cancer patients,* 2011
3 De Angelis R, Sant M, Coleman MP, Francisci S, Baili P, Pierannunzio D, et al. Cancer survival in Europe 1999-2007 by country and age: results of EUROCARE-5-a population-based study. Lancet Oncology. 2014;15(1):23-34.
4 Riaz SP, Linklater KM, Page R, Peake MD, Møller H, Lüchtenborg M. Recent trends in resection rates among non-small cell lung cancer patients in England. Thorax (2012).

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For further findings, see Routes from Diagnosis: the most detailed map of cancer survivorship yet

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