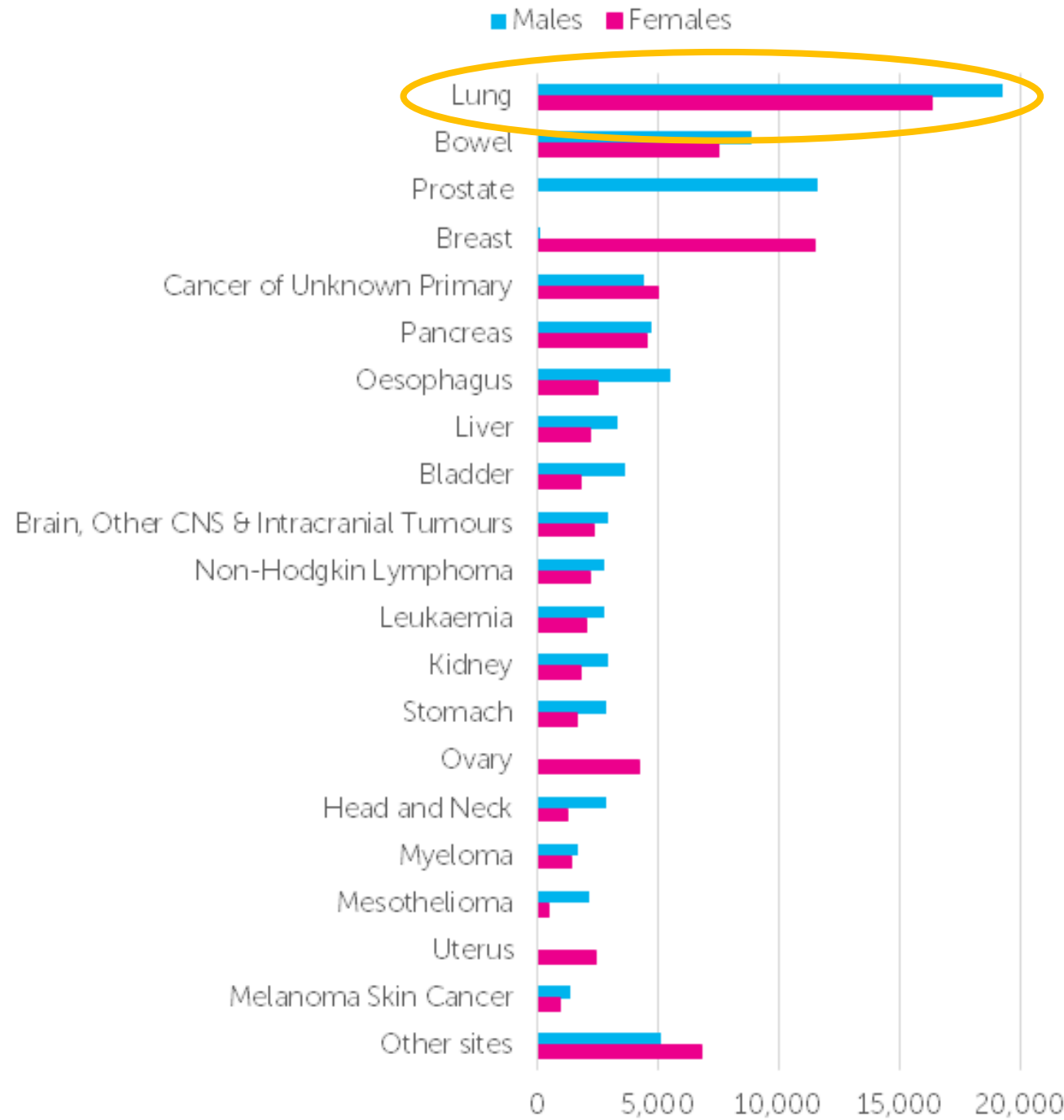


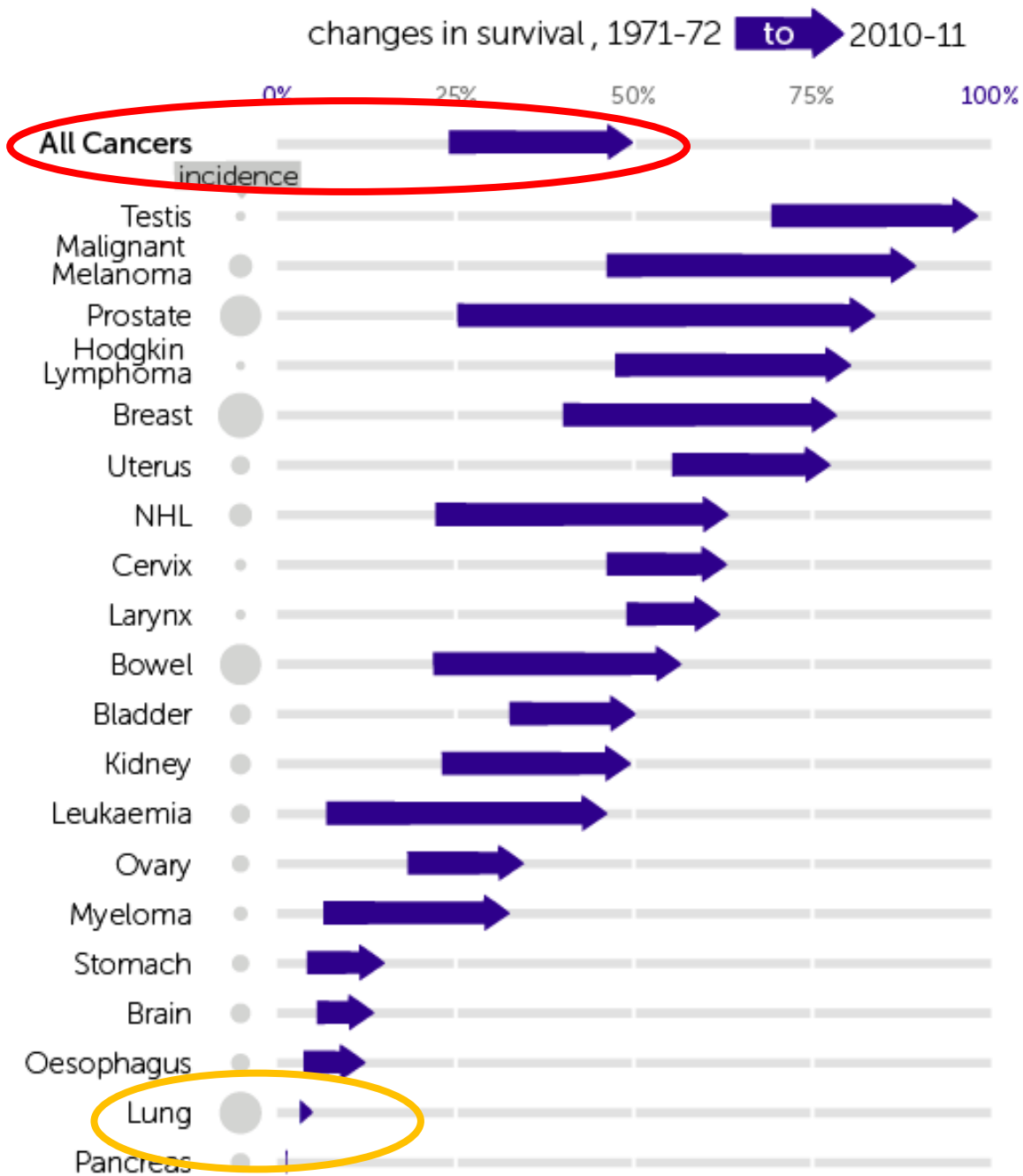
UK Cancer Incidence 2015

Cancer Research UK cruk.org.uk/cancerstats



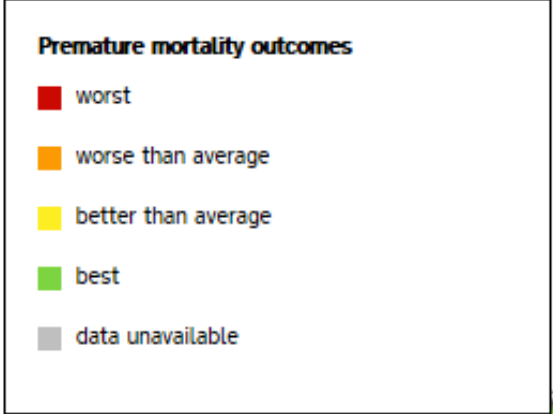
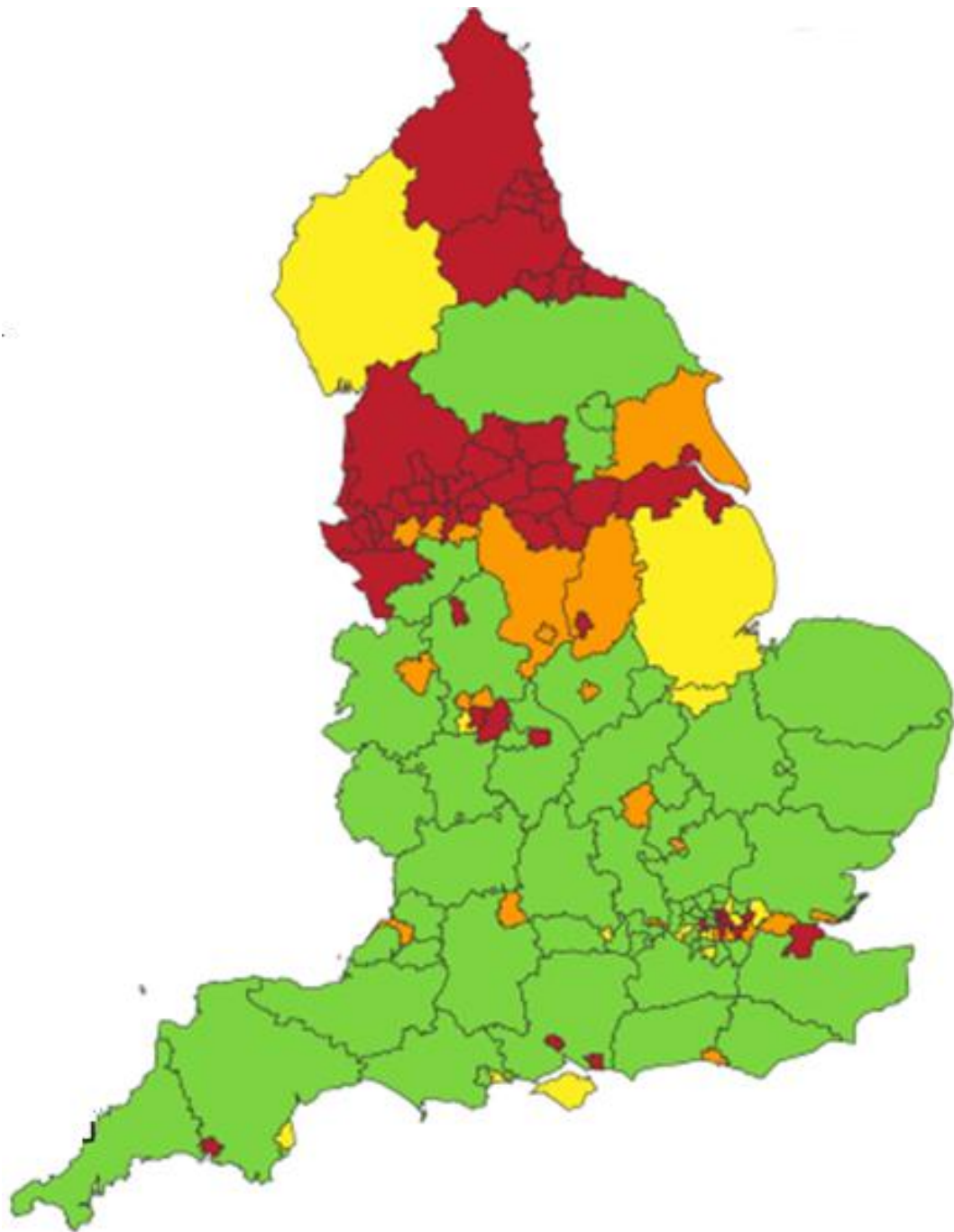
UK Cancer Mortality 2016

Cancer Research UK
cruk.org.uk/cancerstats



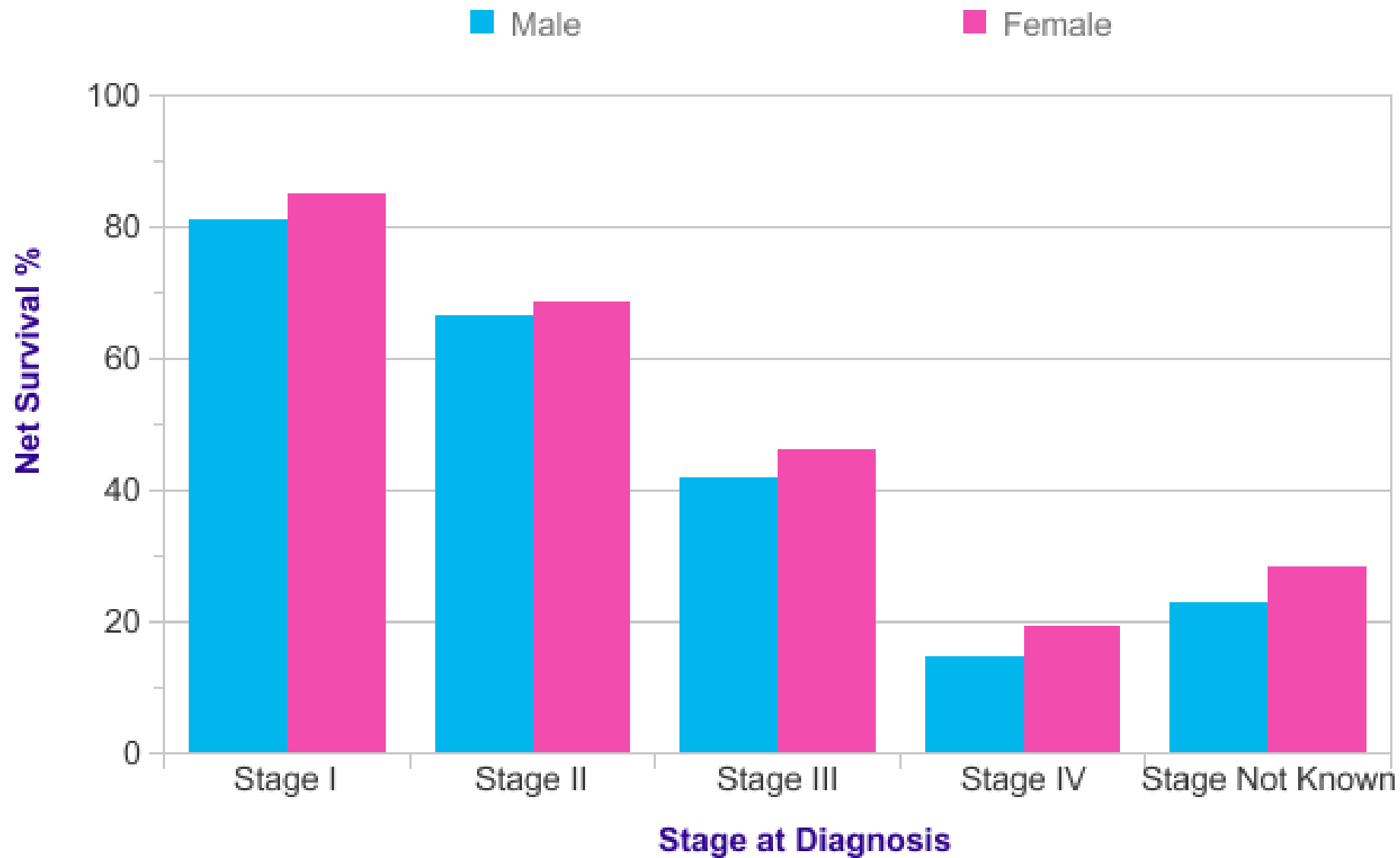
Age-Standardised Ten-Year Survival Trends, England and Wales, 1971-2011

cruk.org.uk/cancerstats



Premature mortality due to Lung Cancer

Public Health England
<https://healthierlives.phe.org.uk/topic/mortality>



One-Year Net Survival (%) by Stage, Adults Aged 15-99, England





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COUGH?
GET A
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If you have a cough, breathlessness or chest pain for over three weeks, you need a chest x-ray. Ask your GP or ring NHS Direct on 0845 46 47





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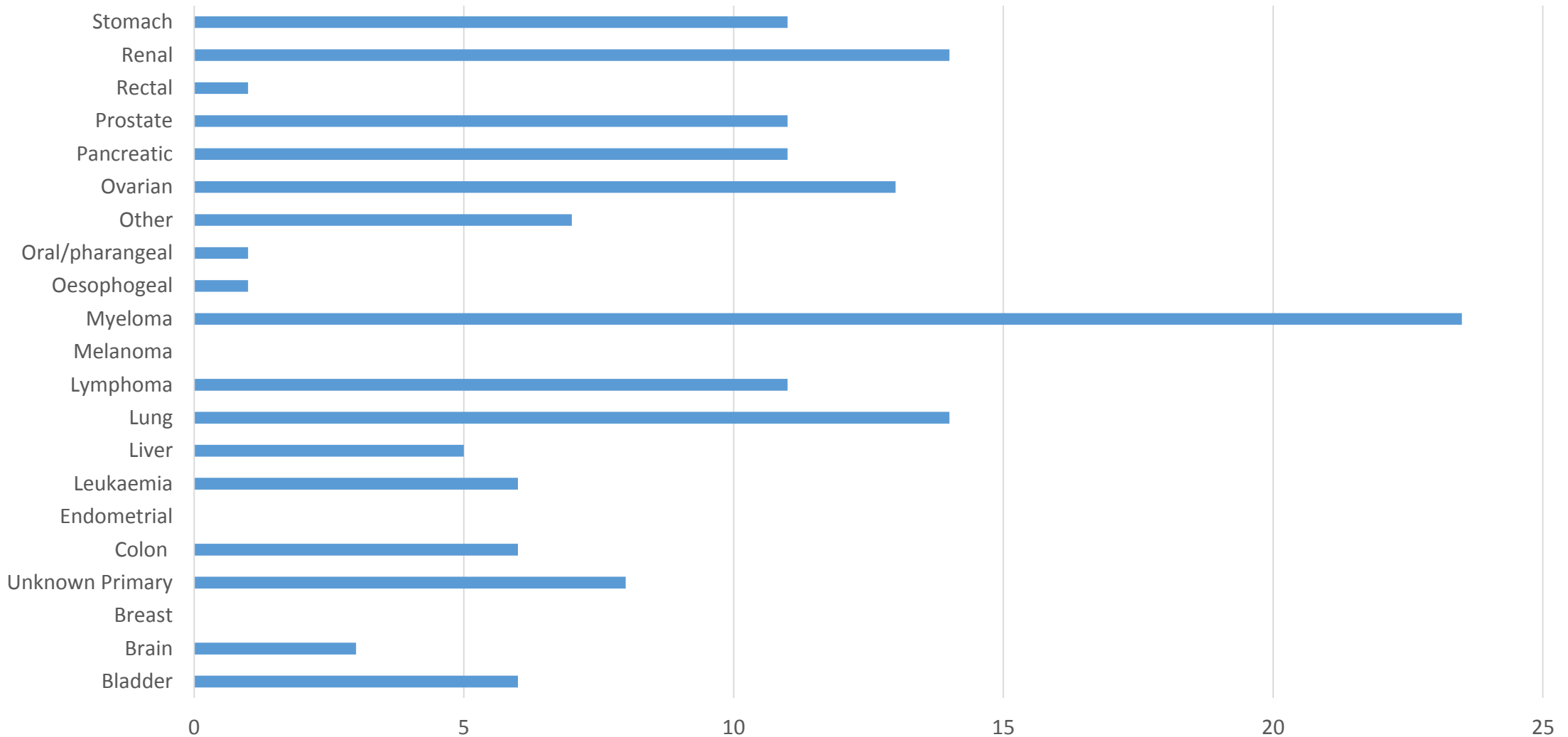


Improving Lung Cancer Diagnosis in Primary Care

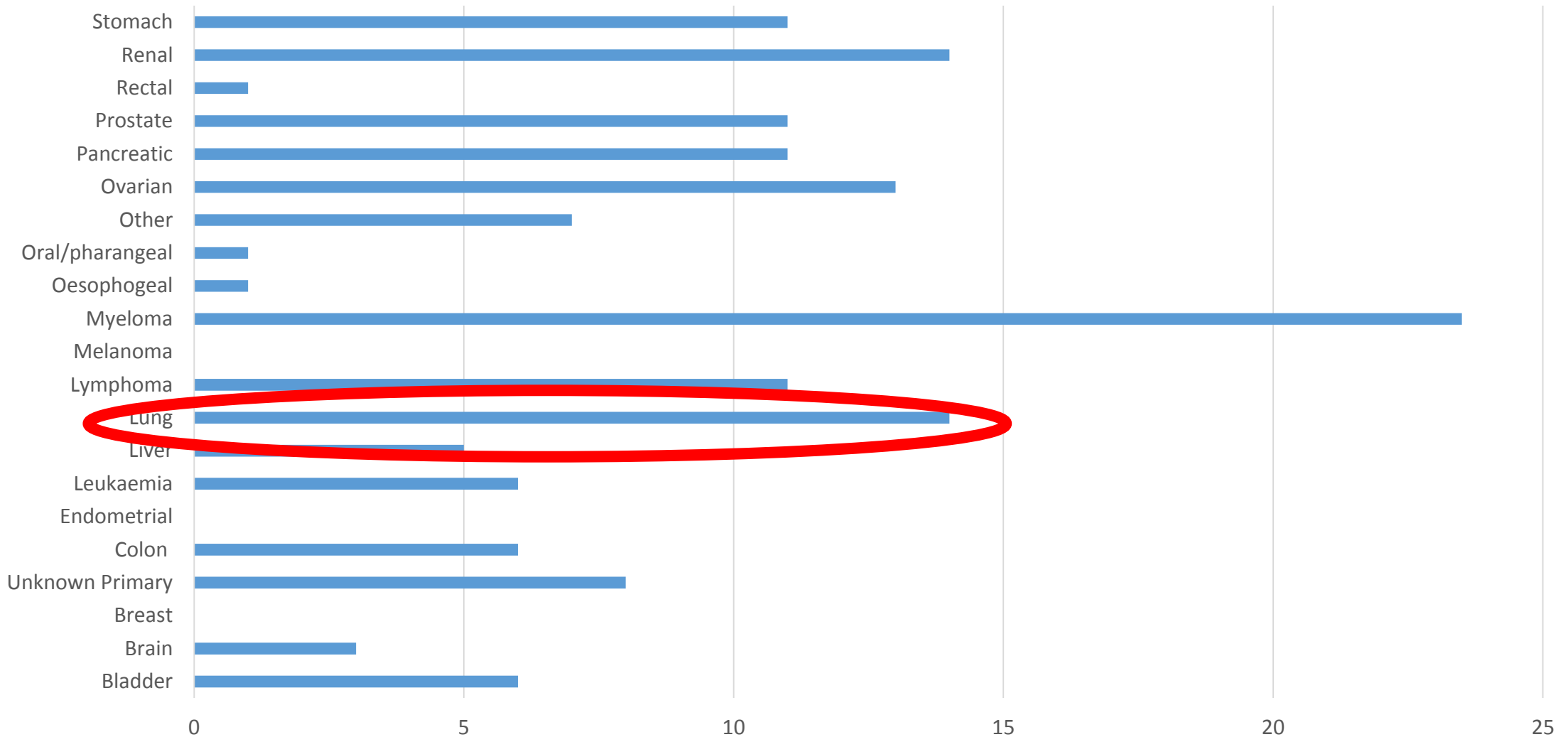
Stephen Bradley

***Clinical Research Fellow
CanTest (CRUK) & University of Leeds***

Primary Care Interval (Days)



Primary Care Interval (Days)





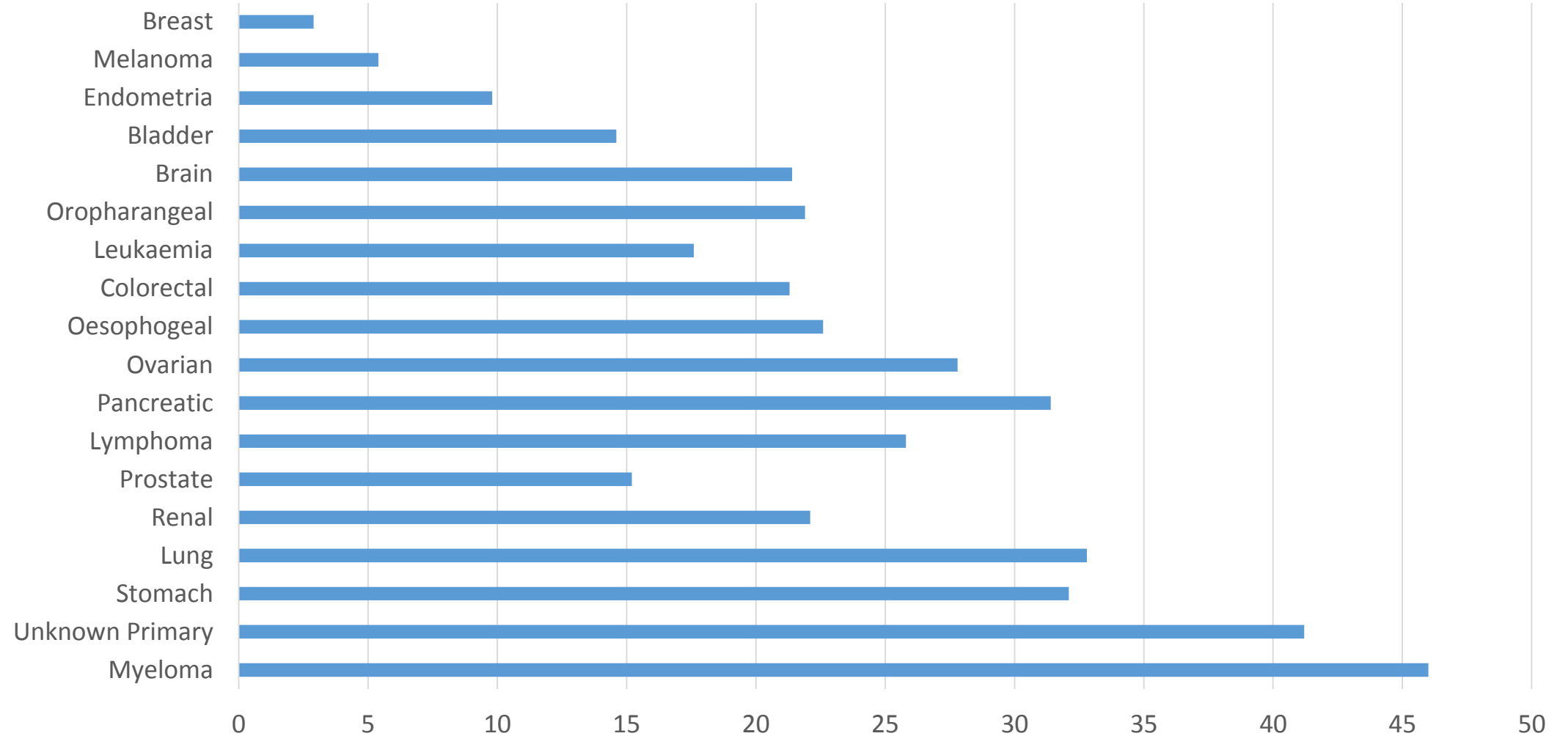
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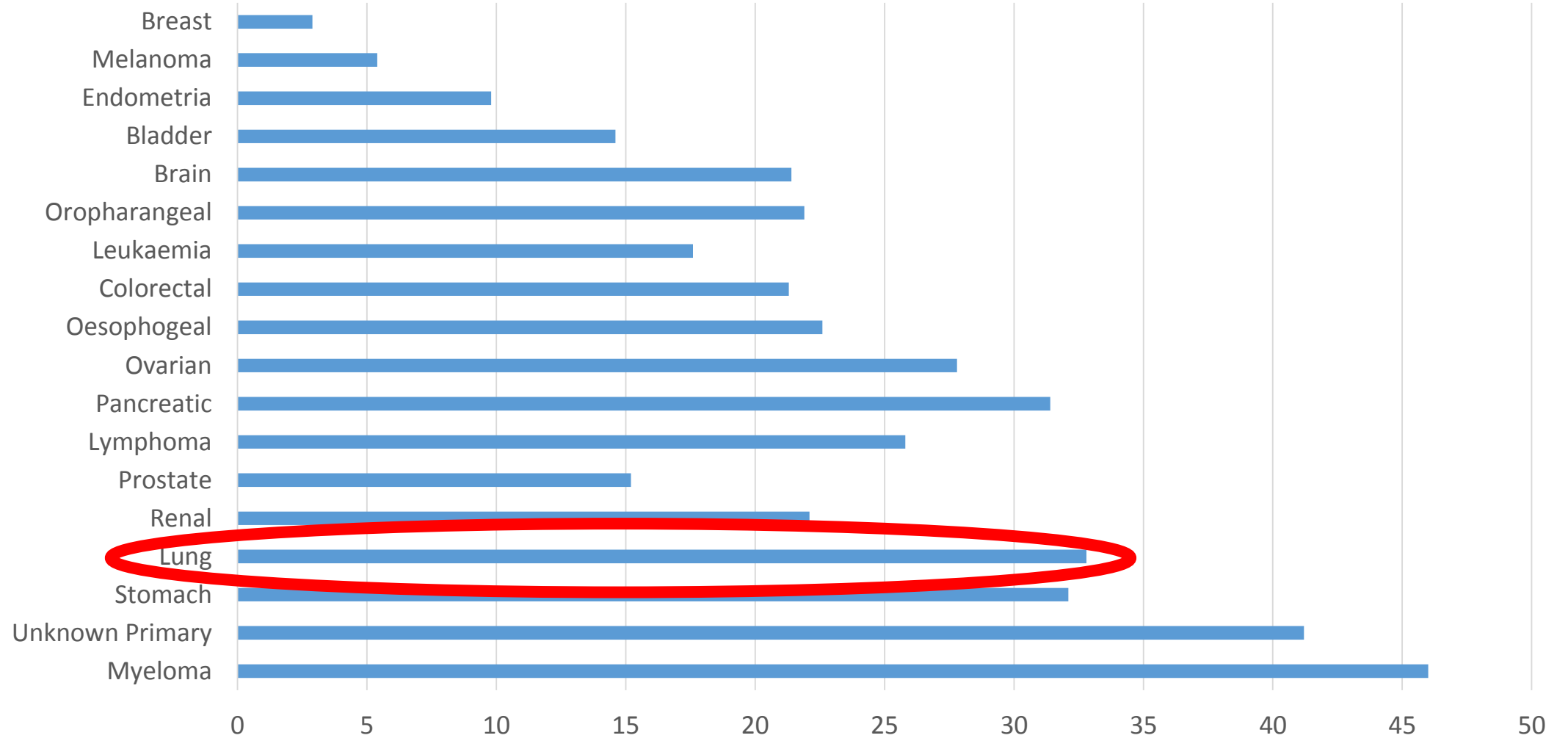
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% \geq 3 consultations





% ≥ 3 consultations



Symptom	% who had symptom	Positive Predictive Value (%)
Cough	65	0.40
Fatigue	35	0.43
Dyspnoea	56	0.66
Chest Pain	42	0.82
Weight Loss	27	1.10
Loss of appetite	19	0.87
Haemoptysis	20	2.4

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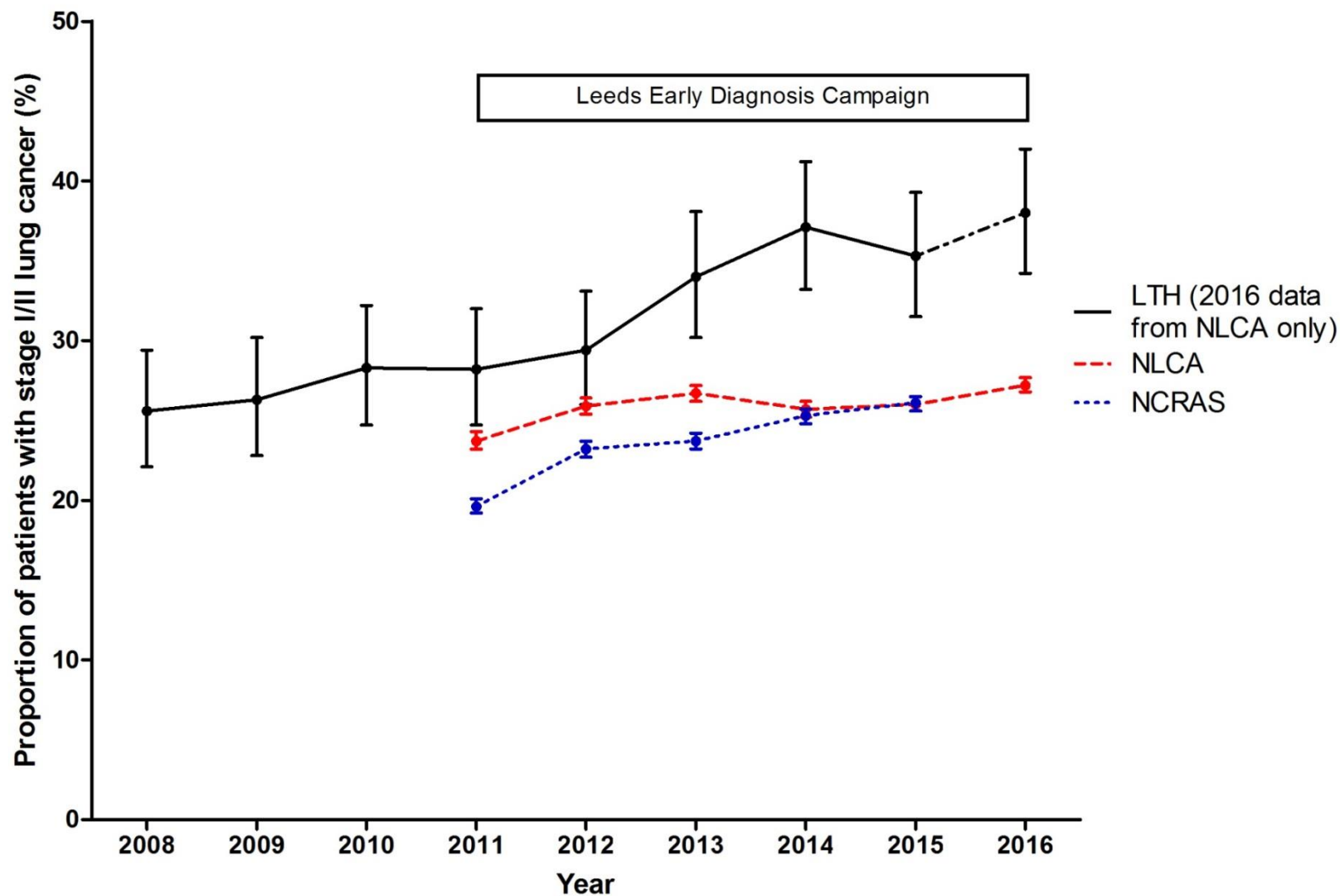
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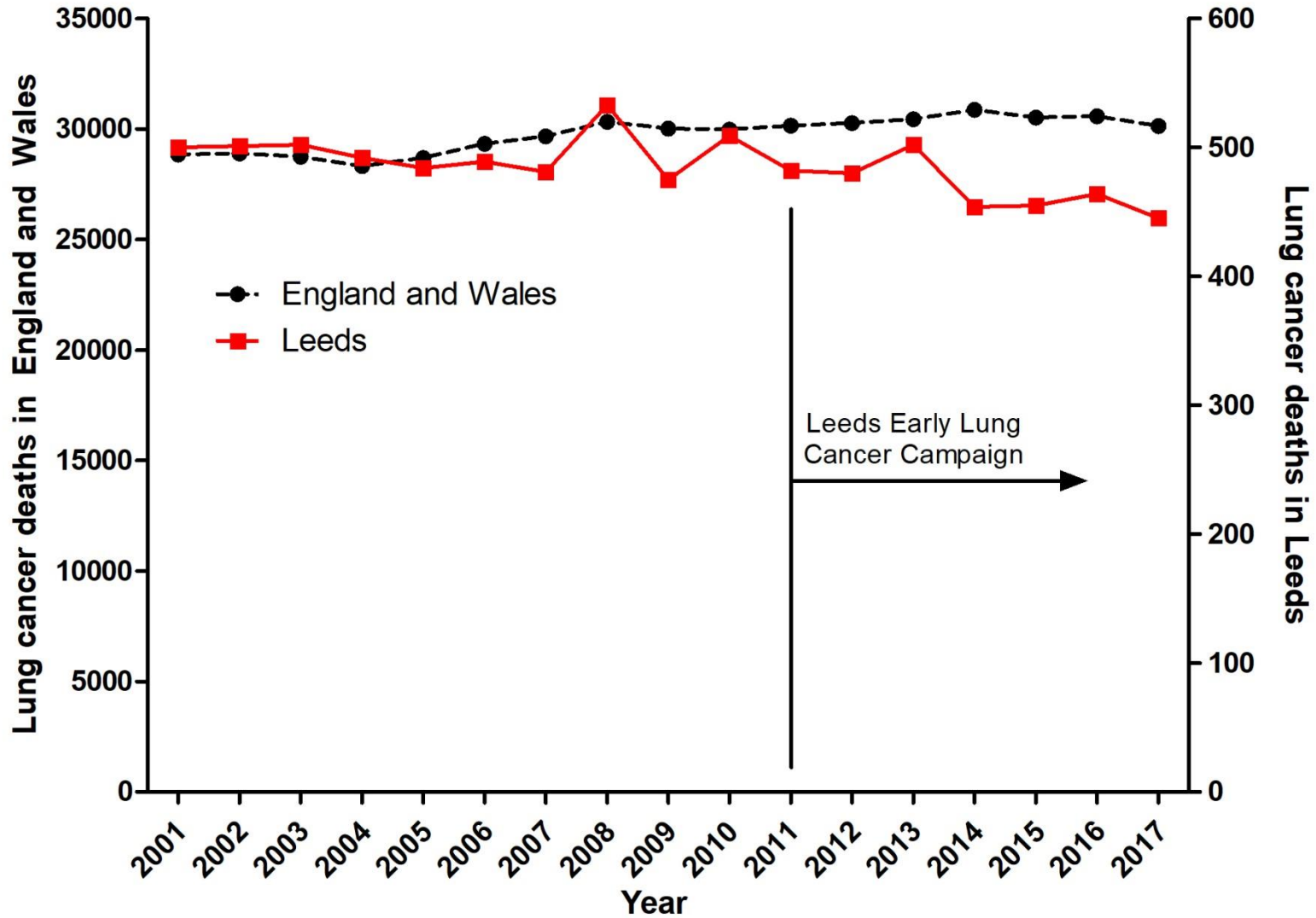


Year	Total Community CXR
2008	17,673
2009	18,804
2010	20,251
2011	29,280
2012	35,576
2013	32,089
2014	36,142
2015	34,352

Patients with stage I/II lung cancer as a proportion of all those with TNM-staged cancer



Lung cancer deaths in Leeds and England and Wales 2000-2017





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How accurate is CXR?



How accurate is CXR?

Year	Author	No.	Design	Population	Sensitivity
1999	Hamada	31	Case series	Asbestos	70.97
1999	Rouetbi	7	Case series	Pulmonary fibrosis	71.43
1999	Tanaka	3	Case series	Gingival mets	100.00
			Prospective case series		
2002	Haro	208	Case series	Haemoptysis	32.21
2002	Hirano	6	Case series	Subcutaneous emphysema	83.33
2002	Losa Gaspa	93	Case series	Presenting with haemoptysis	70.32
2003	Abraham	23	Case series	Primary lung cancer	74.61
2003	Sawada	3	Case series	Non-small cell carcinoma	100.00
2003	Wu	168	Case series	Paraneoplastic syndrome	51.90
2004	Aketa	4	Case series	Pleomorphic carcinoma	100.00
2004	Gomez	4	Case series	Carcinoid	31.70
2004	Schrevens	6	Case series	Carcinoid	56.72
2004	Tamura	4	Case series	Tuberculous empyema	75.00
2004	Ucgun	4	Case series	Synchronous tumours	100.00
2005	Berk-Takir	78	Case series	Operable lung cancer	96.15
2005	Deb	22	Case series	Carcinoid	52.17
2005	Kitazaki	2	Case series	Bronchiolalvelar	0.00
2006	Bando	15	Case series	Vocal cord paralysis	80.00
2006	Bjerager	58	Case note review	Lung cancer	79.31
2006	Brock	30	Case series	HIV	40.00
2006	Gungor	24	Case series	Carcinoid	37.50
2006	Stapley	164	retrospective cohort	Lung cancer	76.80
2007	Fernandez	102	Case series	Lung cancer	73.52
2009	Mitchell	96	Case series	Lung cancer	82.22
2010	Haque	45	Case series	Small cell w/ stomach mets	100.00
2012	Okazaki	2	Case series	Young people	96.86
2012	Paraschiv	14	Audit	Lung cancer	44.19
2014	Ireland	86	Audit	Lung cancer	32.91
2015	Barry	158	Analysis of SEAs	Lung cancer	76.04

8,356



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How accurate is CXR?

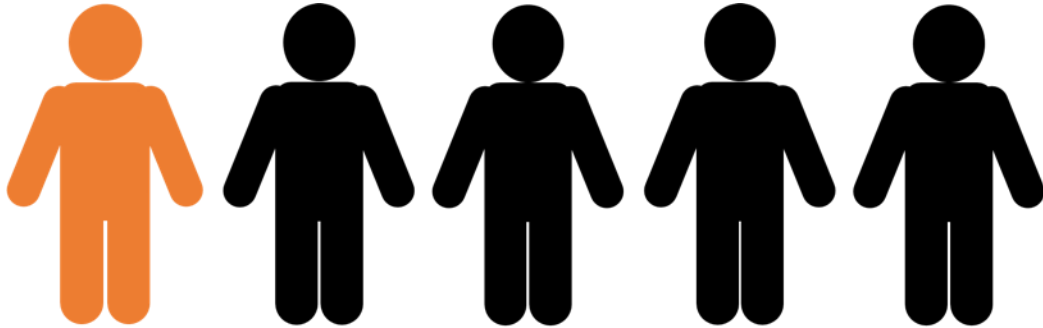
76.8 - 79.3% sensitive

Stapley et al., Br J Gen Pract 2006; 56 (529): 570-573.

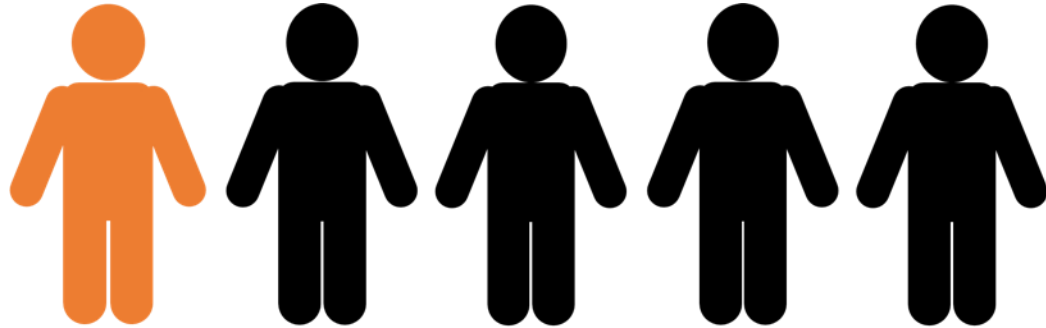
Bjerager et al, Br J Gen Pract 2006; 56 (532): 863-868

Does it matter?

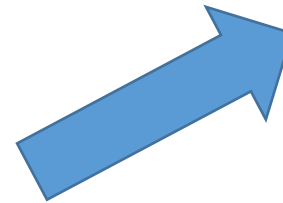
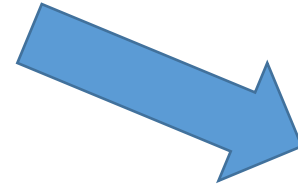
Does it matter?



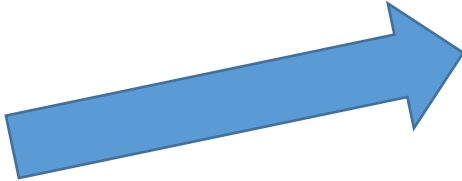
Does it matter?



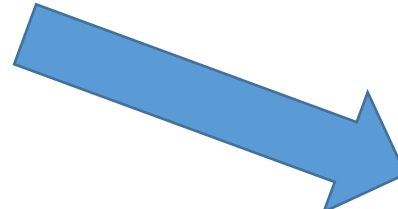
What happens to patients with false negative CXRs?



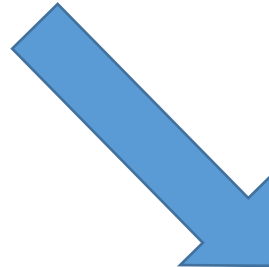
What happens to patients with false negative CXRs?



1. CXR
Diagnosed
Lung Cancer



2. CXR
Indeterminate



3. CXR Normal

What happens to patients with false negative CXRs?

1. Diagnostic
CXR

2. CXR
Indeterminate

3. CXR Normal



```
graph TD; A[1. Diagnostic CXR] --> D[Time to diagnosis from CXR  
Stage of Cancer  
Survival  
Health Care Use]; B[2. CXR Indeterminate] --> D; C[3. CXR Normal] --> D;
```

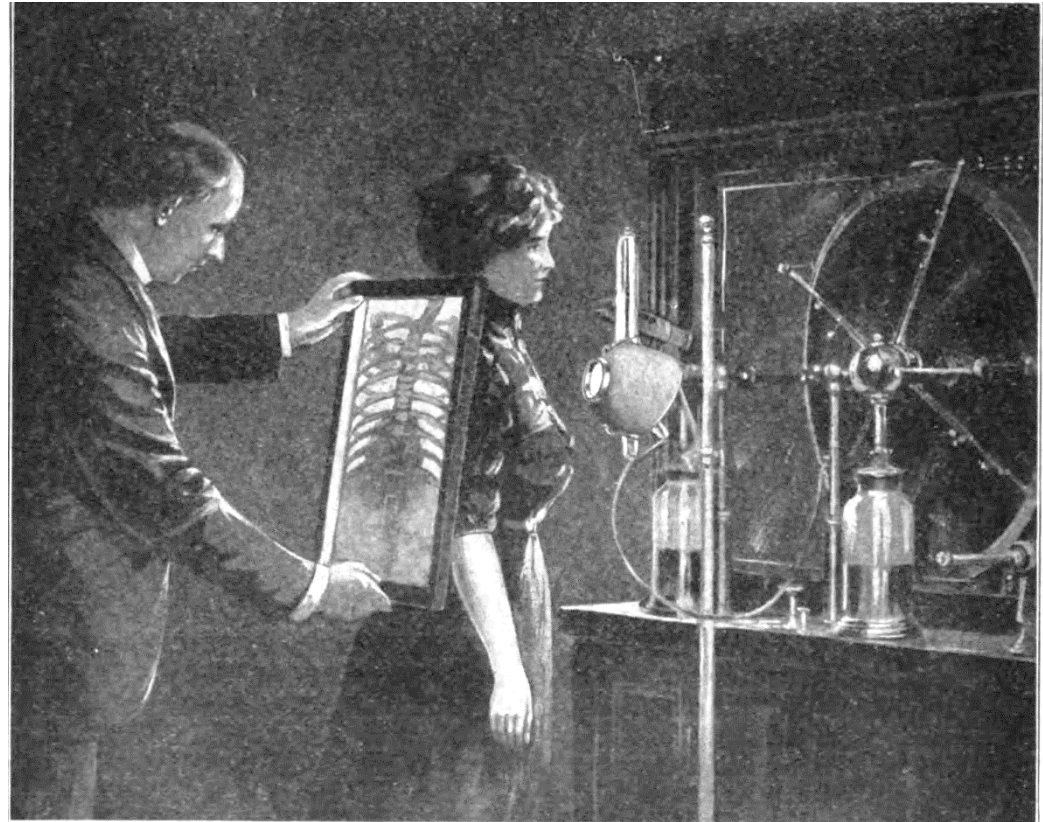
Time to diagnosis from CXR
Stage of Cancer
Survival
Health Care Use

Other Plans...

Other Plans...



Other Plans...



The **NEW ENGLAND**
JOURNAL *of* **MEDICINE**

ESTABLISHED IN 1812

AUGUST 4, 2011

VOL. 365 NO. 5

Reduced Lung-Cancer Mortality with Low-Dose Computed Tomographic Screening

The National Lung Screening Trial Research Team*

ABSTRACT

BACKGROUND

The aggressive and heterogeneous nature of lung cancer has thwarted efforts to reduce mortality from this cancer through the use of screening. The advent of low-dose helical computed tomography (CT) altered the landscape of lung-cancer screening, with studies indicating that low-dose CT detects many tumors at early stages. The National Lung Screening Trial (NLST) was conducted to determine whether screening with low-dose CT could reduce mortality from lung cancer.

METHODS

From August 2002 through April 2004, we enrolled 53,454 persons at high risk for lung cancer at 33 U.S. medical centers. Participants were randomly assigned to undergo three annual screenings with either low-dose CT (26,722 participants) or single-view posteroanterior chest radiography (26,732). Data were collected on cases of lung cancer and deaths from lung cancer that occurred through December 31, 2009.

RESULTS

The rate of adherence to screening was more than 90%. The rate of positive screening tests was 24.2% with low-dose CT and 6.9% with radiography over all three

The members of the writing team (who are listed in the Appendix) assume responsibility for the integrity of the article. Address reprint requests to Dr. Christine D. Berg at the Early Detection Research Group, Division of Cancer Prevention, National Cancer Institute, 6130 Executive Blvd., Suite 3112, Bethesda, MD 20892-7346, or at bergc@mail.nih.gov.

*A complete list of members of the National Lung Screening Trial research team is provided in the Supplementary Appendix, available at NEJM.org.

This article (10.1056/NEJMoa1102873) was published on June 29, 2011, at NEJM.org.

N Engl J Med 2011;365:395-409.
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VOL.

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ABSTRACT

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The aggressive and heterogeneous nature of lung cancer has prompted efforts to reduce mortality from this cancer through early detection. The advent of low-dose helical computed tomography (CT) heralded a new era of lung-cancer screening, with studies indicating that low-dose CT detects many tumors at early stages. The National Lung Screening Trial (NLST) was conducted to determine whether screening with low-dose CT could reduce mortality from lung cancer.

DESIGN

From August 2002 through April 2004, we enrolled 53,454 persons at high risk for lung cancer at 33 U.S. medical centers. Participants were randomly assigned to undergo three annual screenings with either low-dose CT (26,722 participants) or single-view posteroanterior chest radiography (26,732). Data were collected on cases of lung cancer and deaths from lung cancer that occurred through December 31, 2009.

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20% Reduction
Lung Cancer Mortality

But...

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- **only 26.7% eligible**

- **low uptake**

- **Inadequate benefit vs harms**

BACKGROUND

The aggressive and heterogeneous nature of lung cancer has thwarted efforts to reduce mortality from this cancer through the use of screening. The advent of low-dose helical computed tomography (CT) altered the landscape of lung-cancer screening. We studied the effect of low-dose CT on lung-cancer mortality. The National Lung Screening Trial is a randomized controlled trial that tested whether screening with low-dose CT could reduce mortality from lung cancer.

METHODS

From August 2002 through April 2004, we enrolled 53,454 persons at high risk for lung cancer at 33 U.S. medical centers. Participants were randomly assigned to undergo low-dose CT (n = 26,725) or single-view chest radiography (n = 26,729).

Bhandari DPS et al J Clin Oncology. 2018;36 abstract 6504

Brenner et al. JAMA Internal Medicine. 10.1001/jamainternmed.2018.3054

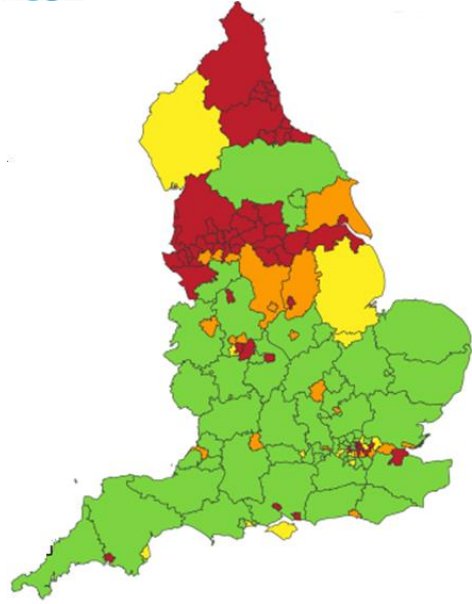
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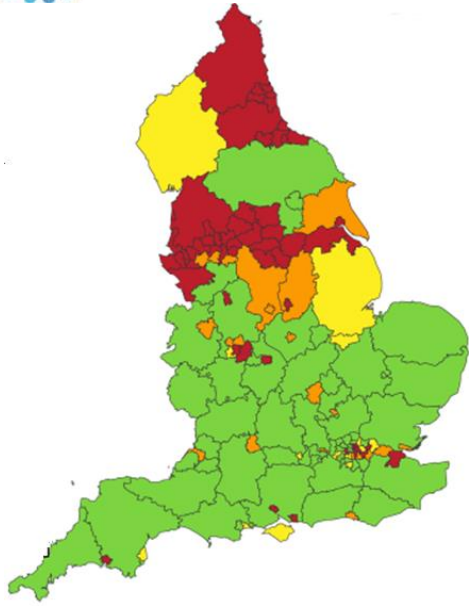


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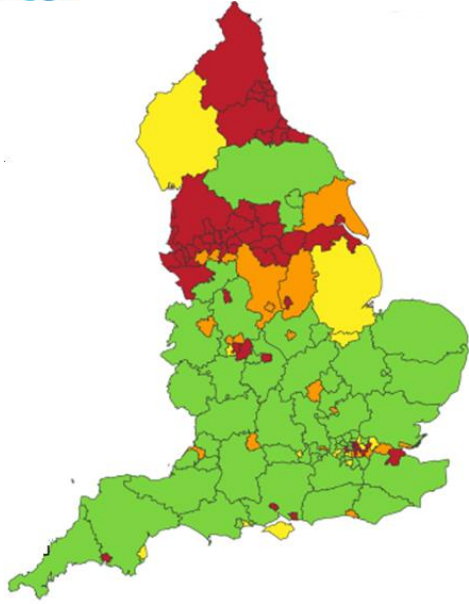
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If you have a cough,
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Ask your GP or

**NHS
Leeds**

The advertisement features a close-up profile of a middle-aged man with a mustache, looking thoughtful with his hand to his chin. The background is a solid blue color.



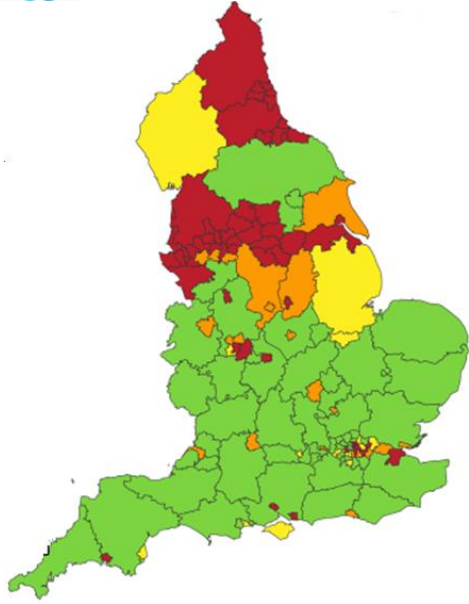
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An NHS Leeds advertisement featuring a blue background. On the right side, there is a close-up profile of an older man with a mustache, looking thoughtful with his hand to his chin. The NHS Leeds logo is in the top right corner. The text on the left reads: "GOT A COUGH? GET A CHECK." in large white letters. Below this, in smaller white text, it says: "If you have a cough, breathlessness or chest pain for over three weeks, you need a chest x-ray. Ask your GP or".

**GOT A COUGH?
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Acknowledgments

Supervisors: Prof Richard Neal, Dr Beth Shinkins, Dr Mat Callister, Prof Willie Hamilton

PPI: Mr Pete Wheatstone

Other collaborators: Dr Martyn Kennedy, Dr Rehima Aslam & Dr Bobby Bhartia

email: medsbra@leeds.ac.uk