

## Supplementary Methods

### *Clinical benefit of early detection of lung cancer*

We anticipated that the main health gain of extracardiac reporting would arise from identification of lung cancer at an early stage. In the context of CT screening programmes, Whynes has described a method for estimating this benefit.[16] Survival data for screened and unscreened cohorts is combined with data from actuarial life tables to estimate the increase in life expectancy of each patient with lung cancer identified with screening as opposed to a later presentation with symptoms. An estimate of the stage-specific time between identification with screening and symptomatic presentation is incorporated to account for lead-time bias.

The United Kingdom's (UK's) National Institute for Health and Care Excellence (NICE) requires that health gains be expressed as quality-adjusted life years (QALYs), to facilitate comparisons between health care interventions.[17] These are expected to be discounted at the same interest rate as that used for discounting costs (3.5% per annum). There are only limited longitudinal data on quality of life following treatment for lung cancer, particularly for those detected by screening. Based on evidence from patients presenting symptomatically, Whynes used a rounded value for the quality adjustment coefficient of 0.6 (ie a gain of 1 life year equates to 0.6 QALYs). These approaches were applied to real-life data from the UK Lung Cancer Screening pilot trial, and yielded an average gain per cancer identified by screening of 3.3 life years undiscounted, 2.1 life years discounted, 2.5 QALYs undiscounted, and 1.6 QALYs discounted.[18]

*Supplementary Table 1: National Health Service tariffs for outpatient appointments and diagnostic tests (2019-2020)*

*HRG = Healthcare Resource Group; PET-CT = positron emission tomography with computed tomography*

*\* Tariff for PET-CT, which is negotiated locally, was the median value calculated from the “Submitted local prices, 2015/16 to 2017/19” workbook*

<b>HRG code</b>	<b>Procedure</b>	<b>Visit</b>	<b>Tariff (£)</b>
<i>Clinical events</i>			
103	Breast surgery outpatient appointment	First	179
		Follow-up	76
173	Thoracic surgery outpatient appointment	First	290
		Follow-up	114
302	Endocrinology outpatient appointment	First	235
		Virtual	64
303	Clinical haematology outpatient appointment	First	275
306	Hepatology outpatient appointment	First	279
		Follow-up	146
340	Respiratory medicine outpatient appointment	First	215
		Follow-up	96
341	Respiratory physiology	Virtual	65
		First	155
370	Medical oncology outpatient appointment	Follow-up	77
		First	272
	Multidisciplinary meeting		20

*Imaging investigations*

RD01A	Magnetic resonance imaging, 1 area, no contrast, >19y	108
RD03Z	Magnetic resonance imaging, 1 area, pre- and post-contrast	157
RD04Z	Magnetic resonance imaging, 2-3 areas, no contrast	135
RD20A	Computed tomography, 1 area, no contrast, >19y report only	20
RD20A	Computed tomography, 1 area, no contrast, >19y	69
RD21A	Computed tomography, 1 area, post contrast, >19y	83
RD26Z	Computed tomography, 3 areas, post contrast	97
RD40Z	Ultrasound scan, <20min, no contrast	39
RD42Z	Ultrasound scan, >20min, no contrast	49
RN03B	PET-CT, >3 areas, >19yo (median of local prices) *	837.25

*Invasive investigations*

DZ69A	Diagnostic bronchoscopy, >19y	569
DZ70Z	Endobronchial ultrasound examination mediastinum	1412
YD03Z	Percutaneous biopsy lesion of lung or mediastinum	864
YD05Z	Percutaneous aspiration of pleural cavity	552
YJ02Z	Unilateral core needle biopsy of lesion of breast	275
YJ09Z	Vacuum-assisted biopsy of lesion of breast	445

*Supplementary Table 2: Comparison of published studies of >250 patients which quoted prevalences of extracardiac abnormalities, lung nodules and/or lung cancer on cardiac computed tomography*

<b>Study</b>	<b>Patients</b>	<b>Extracardiac findings</b>	<b>“Suspicious” lung nodules</b>	<b>Lung cancer</b>	<b>Downstream costs</b>
<b>Electron-beam computed tomography</b>					
Horton 2001 [S1]	1326	7.8%	4.9%	<0.1%	No
Hunold 2002 [S2]	1812	52.6%	1.1%	0.1%	No
Elgin 2002 [S3]	1000	7.9%	-	-	No
Schragin 2004 [S4]	1366	20.5%	3.4%	0	No
<b>Multi-detector computed tomography</b>					
Onuma 2006 [S5]	503	58.1%	12.1%	0.4%	No
Gil 2007 [S6]	258	56.2%	20.2%	-	No
Kawano 2007 [S7]	617	24.1%	10.0%	0.6%	No
Burt 2008 [S8,9]	459	41.4%	17.6%	0	No
Northam	1764	-	11.5%	0.3%	No

2008 [2]					
MacHaalany	966	41.5%	4.9%	0.3%	Yes
2009 [3]					
Chia	1061	8.0%	0.8%	-	No
2009 [S10]					
Yorgun	1206	-	7.5%	0.2%	No
2010 [4]					
Lazoura	1044	56.3%	6.3%	0.2%	No
2010 [5]					
Johnson	6920	23.7%	4.5%	<0.1%	No
2010 [6]					
Kim	11,654	-	-	0.3%	No
2010 [7]					
Bendix	1383	34.8%	0.7%	0.2%	Yes
2011 [8]					
La Grutta	4303	69.6%	-	0.5%	No
2015 [9]					
Williams	1778	38.0%	7.1%	0.2%	Yes
2018 [10]					
Karius	3898	30.2%	4.3%	0.1%	No
2019 [11]					
Ramanathan	1713	35.0%	-	0.1%	No
2019 [12]					
<b>Our Study</b>	<b>4340</b>	<b>15.8%</b>	<b>6.8%</b>	<b>0.1%</b>	<b>Yes</b>

### Supplementary References

[S1] Horton KM, Post WS, Blumenthal RS, Fishman EK. Prevalence of significant noncardiac findings on electron-beam computed tomography coronary artery calcium screening examinations. *Circulation* 2002;106:532-4.

[S2] Hunold P, Schmermund A, Seibel RM, et al. Prevalence and clinical significance of accidental findings in electronbeam tomographic scans for coronary artery calcification. *Eur Heart J* 2001;22:1748-58.

[S3] Elgin EE, O'Malley PG, Feuerstein I, Taylor AJ. Frequency and severity of "incidentalomas" encountered during electron beam computed tomography for coronary calcium in middle-aged army personnel. *Am J Cardiol* 2002;90:543-5.

[S4] Schragin JG, Weissfeld JL, Edmundowicz D, et al. Non cardiac findings on coronary electron beam computed tomography scanning. *J Thorac Imag* 2004;19:82-6.

[S5] Onuma Y, Tanabe K, Nakazawa G, et al. Noncardiac findings in cardiac imaging with multidetector computed tomography. *J Am Coll Cardiol* 2006;48:402-6.

[S6] Gil BN, Ran K, Tamar G, Shmuell F, Eli A. Prevalence of significant noncardiac findings on coronary multidetector computed tomography angiography in asymptomatic patients. *J Comput Assist Tomogr* 2007;31:1-4.

[S7] Kawano Y, Tamura A, Goto Y, et al. Incidental detection of cancers and other non-cardiac abnormalities on coronary multislice computed tomography. *Am J Cardiol* 2007;99:1608-9.

[S8] Burt JR, Iribarren C, Fair JM, et al. Incidental findings on cardiac multidetector row computed tomography among healthy older adults: prevalence and clinical correlates. *Arch Intern Med* 2008;168:756-61.

[S9] Iribarren C, Hlatky MA, Chandra M, et al. Incidental pulmonary nodules on cardiac computed tomography: prognosis and use. *Am J Med* 2008;121:989-96.

[S10] Chia P-L, Kaw G, Wansaicheong G, Ho K-T. Prevalence of non-cardiac findings in a large series of patients undergoing cardiac multi-detector computed tomography scans. *Int J Cardiovasc Imaging* 2009;25:537-43.