

BJR Commentary on EUPS

Title: EUPS – argues that lung cancer screening should be implemented in 18 months.

JK Field¹, DR Baldwin², A Devaraj³, M Oudkerk⁴

1 John K Field PhD FRCPath.

Department of Molecular and Clinical Cancer Medicine,

The University of Liverpool

Liverpool

L7 8TX

UK

Email : J.K.Field@liv.ac.uk

2. David R Baldwin MD FRCP

Respiratory Medicine Unit

David Evans Research Centre

Nottingham University Hospitals, City Campus

Hucknall Road

Nottingham

NG5 1PB

Email: David.Baldwin@nottingham.ac.uk

3. Anand Devaraj MD, FRCR.

Department of Radiology,

Royal Brompton Hospital,

Sydney Street, London,

SW3 6NP, UK.

Email: A.Devaraj@rbht.nhs.uk

4. Matthijs Oudkerk PhD

University of Groningen
University Medical Center Groningen
Center for Medical Imaging EB 45
Hanzeplein 1
9700RB Groningen
Email: m.oudkerk@umcg.nl

Correspondence to:
Professor John K Field PhD FRCPath.
The Roy Castle Lung Cancer Research Programme
Department of Molecular and Clinical Cancer Medicine
The University of Liverpool
6 West Derby St
Liverpool
7 8TX
UK
Email : J.K.Field@liv.ac.uk

ABSTRACT

The EU Position Statement (EUPS) expert group comprised of individuals who have been actively involved in the planning and execution of all the low dose computed tomography (LDCT) randomised controlled European screening trials. They have argued that as lung cancer screening with LDCT saves lives, planning for implementation needs to be started by the national health organisations throughout Europe.

The EUPS examined the current evidence which supports the planning for the implementation of lung cancer screening, as well as areas which require further work. One of the major areas the EUPS focused on was the management of prevalent lung nodules in CT screening programmes, lung nodules at incident screening (newly detected) and CT-detected lung nodules in clinical practice should be managed with different protocols, due to different pre-test lung cancer probability. The EUPS provides nine recommendations and a 'Call to Action' for implementation, which is naturally dependent on the outcome of the NELSON trial.

Clearly, the issue is how Europe can take this forward as part of the political agenda of individual countries, as well as that of the EU Commission. An EU policy document has been developed, which focuses on the key steps in the implementation of cost effective lung cancer screening in Europe.

The EU Position Statement (EUPS) on lung cancer screening argues that as lung cancer screening with low dose computed tomography (LDCT) saves lives, we need to start planning for implementation by the national health organisations throughout Europe [1]. Evidence from the NLST trial demonstrates 20% reduction in mortality; furthermore, evidence from the six European pilot trials on other aspects of screening, provides sufficient evidence to initiate the planning for lung cancer screening now; whilst mortality data and cost effectiveness data is awaited from the NELSON trial [2].

The EUPS expert group comprised of individuals who have been actively involved in the developmental planning and execution of all the randomised controlled European screening

trials. The EUPS Expert group benefited from the experience of clinical trialists and all the clinical specialist groups actively engaged with the clinical management of lung cancer patients. Furthermore, many of these individuals have been instrumental in providing the published evidence and in the development of the relevant clinical guidelines, i.e. British Thoracic Society (BTS) Guidelines [3].

The EUPS group, comprising experts across all of the clinical disciplines in CT lung cancer screening, and representing eight countries, decided to provide leadership and direction to the European Policy makers on how lung cancer screening should be taken forward.

The EU Position Statement on lung cancer screening (EUPS) policy document published December 2017 in Lancet Oncology [1] provided a set of nine recommendations on how we should take lung cancer CT screening forward in Europe, dealing with many of the outstanding questions which were posed, post the 2011 NLST publication [4] [5].

The EUPS examined the current evidence which supports the planning for the implementation of lung cancer screening, as well as areas which require further work, such as the identification of hard to reach individuals, the further development of risk prediction models, which may have to be country specific and also on the availability and training of Thoracic Radiologists, to support future screening programmes. One of the major areas the EUPS focused on was the management of prevalent lung nodules in CT screening programmes, lung nodules at incident screening (newly detected) and CT-detected lung nodules in clinical practice should be managed with different protocols, due to different pre-test lung cancer probability.

The EUPS outlined the actions which need to be undertaken by the European screening community prior to implementation.

1. Current evidence points to the inescapable fact that Low Dose Computed Tomography is the only screening intervention with level one evidence for the early detection of lung cancer, the NLST trial data, provided evidence that the CT arm demonstrated a 20% mortality reduction after 3 annual screens and 6.4 years of follow-up compared with three annual chest x-rays.
2. When considering the harms and benefits of lung cancer screening, any future lung cancer LDCT programme has to use a validated risk stratification approach. It is

appreciated that we don't currently have the best risk models and in the future, we need to consider incorporating potential biomarkers to improve their accuracy.

3. All participants in lung cancer screening programmes should be provided with clear information regarding the harms and benefits, enabling them to make informed decisions. It was also emphasized that smoking cessation has to be incorporated into any future screening programme as we have good evidence that this is a 'teachable moment'.
4. There is very good evidence from current European screening trials that semi-automated volume and volume doubling time should be incorporated into the management of CT-screen detected solid nodules . In addition, we need to ensure there is a quality assurance system in place.
5. The EUPS recommend that we require National quality assurance systems, set up by professional bodies to ensure adherence to the required standards.
6. The management of prevalent lung nodules in CT screening programmes, lung nodules at incident screening (newly detected) and CT-detected lung nodules in clinical practice should be managed with different protocols, due to different pre-test lung cancer probability.
7. To consider whether we could utilise a risk-based approach based on the results of the baseline and 1st screening round results, to consider whether a subset of individuals could have biennial screening, thereby reducing the number of CT scans in their lifetime and also reduce the overall cost of the programme. The potential of using such an approach would have to take into account if the patient's risk changed over the years and thus revert to annual screening.
8. The EUPS provided recommendations for the management of higher risk lung nodules by the lung cancer MDTs.
9. The EUPS Expert Group recommends planning for implementation of LDCT screening should be started throughout Europe now, as LDCT lung cancer screening saves lives.

The issue is how Europe can take this forward, a plan of action has been drawn up (Figure 1), however, this needs to be part of the political agenda of individual countries as well as that of the EU Commission. The latter has already been undertaken and a EU policy document has been developed. [6], which focused on the key steps in the implementation of cost effective lung cancer screening in Europe.

The European policy outlined that there should be equity across all social groups, even the NLST ended up recruiting a younger and 'health aware' population. The UK Accelerate, Coordinate, Evaluate (ACE) [7] programme, has stimulated independent groups to develop CT screening demonstration projects to focus on the access to the 'hard to reach population'. [8].

Utilising the Regional Development funding [10], potentially the nations will have access to a resource allocation for lung cancer screening in Europe. The lung cancer screening community in Europe are requesting specific funding to assist in the planning for implementation, as well as in supporting future programmes in Europe. The current European initiatives may provide a route to assist in this process, such as through the European Guide on Quality Improvement in Comprehensive Cancer Control (CANCON), which follows the European Partnership for Action Against Cancer (EPAAC). CANCON has the goal of reducing cancer incidence by 15% by 2020.

It is appreciated that each nation in Europe has to independently decide to implement lung cancer screening within their own health service, based on the implementation of current screening programmes in breast, colon and cervical cancer. This aligns with Decision No 1350/2007/EC of the European Parliament and of the Council of 23 October 2007 establishing a second programme of Community action in the field of health (2008-2013).

The EU Policy document recommended that the EU Council initiated an EU Expert Group on lung cancer screening which reflects the experience with the existing recommendations and guidelines for the three other cancers. The European Recommendations should be developed in association with professional groups involved in CT screening in Europe.

The EUPS Call for Action provides a plank in which the lung cancer clinical community can start to plan the implementation of lung cancer screening.

1. Oudkerk M, Devaraj A, Vliegenthart R, Henzler T, Prosch HH, CP. Bastarrika, G. Sverzellati, N. Mascali, M. Delorme, S. Baldwin, DR. Callister, ME. Becker, N.

- Heuvelmans, MA. Rzyman, W. Infante, MV. Pastorino, U. Pedersen, JH. Paci, E. Duffy, SW. de Koning, H. Field, JK.: **EU Position Statement on Lung cancer Screening**. *Lancet Oncology* 2017, **12**:e754-e766. .
2. van Klaveren RJ, Oudkerk M, Prokop M, Scholten ET, Nackaerts K, Vernhout R, van Iersel CA, van den Bergh KA, van 't Westeinde S, van der Aalst C, et al: **Management of lung nodules detected by volume CT scanning**. *N Engl J Med* 2009, **361**:2221-2229.
 3. Callister ME, Baldwin DR, Akram AR, Barnard S, Cane P, Draffan J, Franks K, Gleeson F, Graham R, Malhotra P, et al: **British Thoracic Society guidelines for the investigation and management of pulmonary nodules**. *Thorax* 2015, **70 Suppl 2**:ii1-ii54.
 4. National Lung Screening Trial Research T, Aberle DR, Adams AM, Berg CD, Black WC, Clapp JD, Fagerstrom RM, Gareen IF, Gatsonis C, Marcus PM, Sicks JD: **Reduced lung-cancer mortality with low-dose computed tomographic screening**. *N Engl J Med* 2011, **365**:395-409.
 5. Field JK, van Klaveren R, Pedersen JH, Pastorino U, Paci E, Becker N, Infante M, Oudkerk M, de Koning HJ, European Randomized Screening Trial G: **European randomized lung cancer screening trials: Post NLST**. *J Surg Oncol* 2013, **108**:280-286.
 6. Field JK, Javier Z, G. V, Matthijs M, Oudkerk M, D.R. B, Pedersen JH, Paci E, Horgan D, de Koning HJ: **EU Policy on Lung Cancer CT Screening 2017**. *Biomed Hub* 2017, **2(suppl 1)**:479810, <https://doi.org/10.1159/000479810>.
 7. **Accelerate, Coordinate, Evaluate (ACE) Programme** [<http://www.cancerresearchuk.org/health-professional/early-diagnosis-activities/ace-programme>]
 8. **Liverpool Healthy Lung project** [<http://www.liverpoolccg.nhs.uk/health-and-services/healthy-lungs/>]
 9. **Commission Decision of 30 July 2013 setting up a Commission expert group on rare diseases and repealing Decision 2009/872/EC** - [https://ec.europa.eu/health/sites/health/files/rare_diseases/docs/dec_expert_group_2013_en.pdf]