LUNG CANCER POLICY NETWORK

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Interactive map of lung cancer screening

Research methodology

Third edition

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The Lung Cancer Policy Network is a global network of multidisciplinary experts from across the lung cancer community, which includes clinicians, researchers, patient organisations and industry partners. The Network is funded by AstraZeneca, Bristol Myers Squibb Foundation, Johnson & Johnson, MSD, Siemens Healthineers, GE HealthCare, Guardant Health, and Intuitive. Secretariat is provided by The Health Policy Partnership, an independent health research and policy consultancy. All Network outputs are non-promotional, evidence based and shaped by the members, who provide their time for free.

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1 About this document

This document outlines the methodology for developing the Lung Cancer Policy Network's interactive global evidence map of low-dose computed tomography (LDCT) lung cancer screening implementation studies, programmes and clinical trials (referred to in this document as 'study/programme').

The Health Policy Partnership (as Secretariat) has developed this methodology in close consultation with Network members. This methodology aims to:

- follow a consistent approach, using standard definitions and terminology for all entries in the map database
- adhere to a common template so that data are comparable across different types of entries shown on the map.

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1.1 The Lung Cancer Policy Network's interactive map

The map serves as a global repository of research related to the implementation of organised LDCT screening for lung cancer. The objectives of the map are to provide information to countries that are considering implementation of LDCT lung cancer screening, and to facilitate the sharing of lessons, including from countries that have established screening programmes.

The map is designed to optimise the sharing of information among the lung cancer screening community and enable the comparison of data to obtain findings on the status of LDCT screening implementation and guide policy discussions at a national level. Users may find this resource helpful for answering a range of questions (*Box 1*).

Box 1. Questions the interactive map can help answer

- What LDCT lung cancer screening (clinical trials/implementation studies/national or regional organised programmes) are taking place, and where?
- Which lessons can be learnt from the implementation of LDCT screening studies/programmes?
  - Which inclusion criteria/screening intervals/protocols etc. are most common in [*region*]?
  - What approaches to [*participant recruitment/communicating results from screening* etc.] have been adopted in [*country*] and by which healthcare professionals?
  - What are some important contextual factors around implementing screening in [*region*]? Examples include workforce and technical capacity, processes for quality assurance, training of healthcare professionals, and data management systems.
- Which countries are investigating how to implement LDCT screening with [*biomarker testing/smoking cessation/computer-aided detection* etc.]?
- What outcomes from screening have been observed in [*studies/programmes*] and how do they compare? For example, what proportion of participants [*invited to screening attended the appointment/were diagnosed with early-stage lung cancer*]?

1.2 Process for development

In 2021, we conducted scoping research to identify studies investigating the implementation of LDCT screening in different regions, including a global review of lessons learnt from existing organised screening programmes.[1-18] Findings from this research informed a preliminary list of studies/programmes to include in the map, which was later expanded to include clinical trials.

We then consulted peer-reviewed and grey literature – including published protocols and conference proceedings – to collate information for each identified entry included in the map. We sought expert commentary on the literature findings and, where possible, consulted with study/programme leads to ensure that the data were accurate and up to date (see *Section 4* for details).

The contents of the map are updated on a regular basis using structured scans of literature as well as submissions received via the official form.

- Major updates include a comprehensive review of existing entries as well as the addition of new entries, which typically focus on a particular geographical region based on current gaps in the map's data.
- Minor updates occur approximately four times a year and do not include a full review of existing entries. Instead, the search strategy (*Section 4*) will be used to identify studies that have been launched since the previous literature search was conducted.

2 Eligibility criteria for the interactive map

The interactive map is updated on a regular basis. As such, the timeframe for when the included studies/programmes took place is iteratively expanded to gradually grow the data set and include new initiatives in each subsequent edition. Minor updates include searches since the last update (e.g. the year the search is taking place) to improve efficiency.

As the implementation of lung cancer screening gains pace, maintaining clear criteria for the inclusion of studies/programmes is essential for ensuring the scope of the map continues to support its original objective: to track organised LDCT screening.

Inclusion criteria:

- Implementation studies, regional/national programmes or clinical trials ('study/programme'; see *Box 2* for definitions)
- The study/programme is investigating the implementation of LDCT screening for the early detection of lung cancer in high-risk people
- It targets asymptomatic people who are considered to be at high risk of developing lung cancer, taking into account potential local variations in risk factors and screening protocols (*Box 3*)
- The study/programme is focused on organised LDCT screening.[a]

Exclusion criteria:

- The study/programme is not related to the implementation of LDCT screening e.g.:
    - It focuses on cost-effectiveness analyses outside of the context of implementation (i.e. planning or evaluating an implementation study or programme that meets the inclusion criteria)
    - It focuses on smoking cessation outside of LDCT screening or considers factors around the implementation of screening as secondary objectives only.
- The study/programme investigates other approaches to lung cancer screening but not LDCT (e.g. chest X-ray, conventional CT).
- The study/programme is focused on opportunistic LDCT screening for lung cancer.[b]

[a] **Organised screening** is when a clearly defined group of people is invited to attend screening following a common protocol, and all participants are offered the same services, information and support.
[b] **Opportunistic screening** happens when someone either requests a screening test or is offered one by a healthcare professional during a routine check-up. Unlike organised programmes, screening is not systematically offered to all people in a given population who might be eligible.

Note on adapting the methodology to map studies/programmes in the US:

The first edition of the interactive map launched in September 2022 and systematically included all ongoing or recently completed studies/programmes identified outside of the US (ending after 31 December 2014).

For the second edition (2023), a more pragmatic approach to US entries was required to balance the high number of studies/programmes that meet the inclusion criteria with the need to ensure the interactive map remained user friendly. As such, the US data set in the second edition of the map are not intended to be comprehensive and will continue to increase gradually in subsequent editions (see also *Section 4*).

Box 2. Definitions of trials, studies and programmes used in the map*

- **Clinical trial:** a randomised controlled trial (RCT) that seeks to assess whether LDCT screening is more effective in reducing mortality – either lung cancer-related or all-cause – than a control intervention, such as non-LDCT screening or usual care. The study divides participants into two groups that are otherwise similar to assess whether any observed differences in outcomes between the two trial arms are statistically significant and not due to bias.
- **Implementation study:** a study, either randomised or non-randomised, that focuses on exploring the implementation of LDCT screening in a real-world context. Examples include implementation trials, feasibility studies and the preliminary roll-out of an organised programme at designated sites or geographical regions (pilots). These studies aim to identify the best parameters for implementing screening in a given population, such as quality assurance, training of healthcare professionals, and methods for identifying and recruiting the target population.
- **National/regional programmes:** a formally endorsed and organised national or regional-level LDCT lung cancer screening programme.

* Although the terminology can vary in the literature,[19-23] these definitions have been drawn from scoping research and Network consensus on how to categorise each entry for the purposes of this interactive map.

Box 3. Examples of commonly applied eligibility criteria for lung cancer screening*

- People who currently smoke heavily, based on smoking intensity over a minimum number of years (e.g. ≥30 pack-years, PYs)†
- People who used to smoke and stopped smoking within a minimum number of years before screening (e.g. ≤15 years since quitting, YSQ)
- Age strata in which lung cancer is more likely to present e.g. the US Preventive Services Task Force guidelines consider people aged 50–75 to be high risk,[24] whereas in China, some implementation studies/programmes target people aged ≥40[4]
- People with a family history of lung cancer or other types of cancer
- A subpopulation with context-specific risk factors for lung cancer, such as occupational or environmental exposure to carcinogens, cooking fumes or passive smoking (second-hand exposure to smoke)[10 25]
- People who share other risk factors for lung cancer, such as common comorbidities of lung cancer (e.g. cardiovascular disease, chronic obstructive pulmonary disease)[26]
- Populations defined as being at the highest risk of lung cancer using a composite risk-prediction model, with a defined threshold score for inclusion (e.g. a cumulative 6-year risk ≥1.5% using the $PLCO_{m2012}$)[27]

* These example criteria can be combined to define eligibility for screening.

† The US National Cancer Institute defines a 'pack-year' as a measure of the amount a person has smoked over an extended period.[28] It is calculated by multiplying the number of packs of cigarettes smoked per day by the number of years the person has smoked. For example, one pack-year is equal to smoking one pack per day for one year, half a pack per day for 2 years or two packs per day for half a year.

3 Database variables

3.1 Mapping individual studies/programmes

Information from studies/programmes included in the map database has been categorised into variables to help users interrogate the contents (*Table 1*).

The variables selected cover four domains:

1. Key information
2. Population(s) eligible to participate
3. Key objectives
4. Data on participant outcomes (if reported)

Table 1. Summary of study/programme variables included in the map database (pin map)

1. Key information on the study/programme	
Name and ID	• The name of study/programme (e.g. National Lung Cancer Screening Program). If the official name varies in the literature, a short description of the entry based on key information (e.g. location and design) will be used. • The acronym for the study/programme name (e.g. NLCSP). If no official acronym is available, 'N/A' or '–'. • If there is more than one name for the study/programme (e.g. original name and an English translation), the original title will be provided where possible. • The official identification number if the study/programme is listed as a record on a clinical trials registry (e.g. ClinicalTrials.gov). Otherwise, 'N/A' or '–'.
Location	• The geographical region e.g. Europe (*Section 4.3*). • The political/economic region (e.g. EU-27). • The country (as defined by the provider of the mapping service; *Section 4.3*). • The region within the country where recruitment is taking place, or 'national' if applicable. • The city/locality or where the coordinating centre listed for the study/programme is based. • The primary site for screening or the coordinating centre listed for the study/programme (e.g. Shanghai Changzheng Hospital). If this is unclear in the literature, it can be substituted with the main affiliation of the principal investigator of the study/programme. If neither can be identified, this variable will be marked as missing, and the GPS coordinates will be recorded at the city/locality level only.
Design	• Whether the entry is an implementation study, national or regional programme, or clinical trial (*Box 2*). • Whether it is taking place in more than one country ('yes' or 'no'). If yes, an entry will be created in each country. • Whether it is taking place at more than one site, i.e. multicentre ('yes' or 'no').

	• The number of sites that offer screening within the country the entry relates to.
Duration	• The year when the study/programme commenced and the year it was completed (if unknown, 'N/A' or '–') or is scheduled for completion.
Participants	• The target number of participants the study/programme aims to recruit. • The latest reported number of participants who have undergone a baseline LDCT scan. If a comparison group that did not undergo LDCT screening is included (e.g. in an RCT), only participants who underwent LDCT screening will be reported.
2. Population(s) eligible to participate in the study/programme	
Age and sex	• The minimum and maximum age thresholds for inclusion. If maximum age is not specified, this is omitted (e.g. people aged ≥55). • Whether exposure to one or more other risk factors for lung cancer (e.g. smoking history) means that people outside of this age range are also considered eligible ('yes' or 'no'). This will be clarified in a footnote, and the criterion affected will be marked (e.g. ≥35*). • Whether screening is only offered to a specific sex ('male', 'female' or 'N/A').
Smoking history	• The minimum number of pack-years required for people who currently smoke to be considered eligible (e.g. ≥30 pack-years), if applicable. • The minimum number of years since a person quit smoking to be considered eligible (e.g. ≤15 years since quitting), if applicable. • If different smoking histories are applied, depending on other eligibility criteria (e.g. age or other risk factors), this will be clarified as a separate note and the criterion affected will be marked with a footnote (e.g. ≥30*). • Whether people who have never smoked are considered eligible ('yes' or 'no').
Risk-modelling	• Whether a risk-modelling approach is taken to determine an individual's eligibility for screening ('yes' or 'no'). • If yes, the abbreviated name of the risk-prediction model applied (e.g. $PLCO_{m2012}$) and the defined minimum risk score (%) for inclusion (e.g. five-year threshold of ≥2%) are given.

Other criteria	• All other inclusion criteria specified. For example:
	  ○ Exposure to other risk factors for lung cancer (e.g. cooking index ≥110, indicating level of exposure to cooking fumes).
	  ○ Whether screening is offered to individuals with a history of other health conditions, such as tuberculosis or HIV ('yes' or 'no').
	  ○ Whether biospecimens, such as blood samples, are currently collected at baseline to select high-risk individuals for screening ('yes' or 'no').
	  ○ Whether a specific approach to recruitment for screening is taken based on gender e.g. targeting women who attend breast cancer screening ('yes' or 'no').

Exclusion criteria	• All exclusion criteria specified.
	  ○ Whether there are any exclusion criteria based on lung cancer comorbidities (e.g. chronic obstructive pulmonary disease, cardiovascular disease) or life expectancy (‘yes’ or ‘no’).
	  ○ Details on exclusion criteria (e.g. a cancer diagnosis in the past five years).

3. Key objectives of the study/programme	
Additional research focus	• Additional research questions. This variable will be limited to a select few broad themes that most closely align with the primary objectives of the study/programme (e.g. biomarkers, clinical effectiveness, computer-aided detection, other non-communicable diseases).
Screening interval	• The frequency of screening offered to participants at baseline (e.g. ‘single scan’, ‘annual’, ‘biennial’ or ‘personalised[c]’).
Recruitment	• Which healthcare professionals are primarily engaged in recruitment: ‘family physicians’ (general practitioners), ‘pulmonologists’ (respiratory medicine specialists) or ‘other’, with details provided in the entry description. • Whether recruitment is carried out via an existing health service, e.g. smoking-cessation clinics, other cancer screening programmes (‘yes’ or ‘no’, with details recorded separately). • Whether screening is offered in a specific non-clinical setting, e.g. workplace, a community centre (‘yes’ or ‘no’, with details recorded separately). • Whether approaches for targeted outreach are used to improve access for those experiencing inequitable barriers to healthcare, e.g. community-based healthcare professionals perform outreach, mobile screening offered in community venues, co-design of recruitment materials (‘yes’ or ‘no’, with details recorded separately). • Whether biospecimens, such as blood samples, are collected at baseline to inform future research into how biomarkers may be used to select high-risk individuals for lung cancer screening (‘yes’ or ‘no’). • Whether there is a protocol for shared decision-making with participants (‘yes’ or ‘no’).
Smoking cessation	• Whether a smoking-cessation intervention (of any kind, including referral, counselling, direct support etc.) is embedded into the screening pathway (‘yes’ or ‘no’). • If yes, when the smoking-cessation intervention is offered to participants (‘pre-screening’, ‘during screening’, ‘post-screening’ or ‘multiple times’).
Evaluation of imaging data	• Details of any nodule management protocol applied (e.g. Lung-RADS v1.1). • Whether a computer-aided detection (CADe) software package, which may or may not use artificial intelligence to interpret LDCT scans, is being investigated or routinely applied by radiologists during screening (‘yes’ or ‘no’).

[c] A **personalised** screening interval is dependent on an individual’s risk factors for lung cancer or other sociodemographic data.

Model of screening	• Whether the implemented model of screening is centralised, decentralised, hybrid or other. • Whether a centralised data management (IT) system is used for storing and sharing data between centres/sites offering screening ('yes' or 'no'). • Whether LDCT screening is offered via CT-equipped vehicles i.e. mobile screening ('yes' or 'no').
Study/programme description	• A summary of other details that will be presented when the pin on the interactive map is clicked. This information may include further details, such as nuances around the data reported in other variables.
4. Participant outcomes from the study/programme (if reported)	
Results	• Whether any baseline, interim or final results have been made available that can be reported using the definitions for the following variables ('yes' or 'no'). • If results have been identified through the environmental scan and reported in the other variables in this section, the year these were published.
Screening uptake	• The proportion of the target population that responded to an invitation for LDCT screening and attended a baseline scan (%).
Follow-up rate	• The proportion of participants referred for follow-up investigation after their baseline scan, including further LDCT scans and diagnostic tests, such as biopsy (%).
False positives	• The proportion of positive or indeterminate LDCT scans detected at baseline that were revealed not to be lung cancer after follow-up (%).
Confirmed lung cancer cases	• The proportion of participants who underwent baseline LDCT screening and were reported to have a 'true-positive' (confirmed) result for lung cancer (%). • This is the total number of cases detected at baseline that have been confirmed via a follow-up scan and further tests as part of a formal diagnosis for lung cancer; it does not include false-positive cases (indeterminate findings found not to be cancer).
Lung cancer staging data[d]	• Early-stage lung cancer: overall proportion of lung cancer cases detected that were stage I/II (%). • Late-stage lung cancer: overall proportion of lung cancer cases detected that were stage III/IV (%).

[d] Reporting the stage at which participants with lung cancer were diagnosed may vary between countries and depend on when the study/programme took place. Owing to this complexity, a simplified approach has been adopted for the interactive map based on which staging data are available in the literature or provided by study/programme leads. Please consult the references cited for each entry for more detailed information.

3.2 Mapping the policy context for LDCT lung cancer screening

We have also developed a second map to provide contextual information about individual studies/programmes. This additional data set, named the 'policy context' (or 'heat map'), aims to provide top-level information on lung cancer screening in each country (*Table 2*).

Table 2. Policy context (heat map)

Country variable	Description
Lung cancer epidemiology	• Incidence: global age-standardised rate of lung cancer cases per 100,000 population, including sex-specific rates (GLOBOCAN data).[29] • Mortality: global age-standardised rate of lung cancer deaths per 100,000 population, including sex-specific rates (GLOBOCAN data).[29] • GLOBOCAN data year: the year of the GLOBOCAN data used for incidence and mortality.

Implementation of lung cancer screening	• Whether the country has previously conducted clinical trials for LDCT screening:
	  ○ 'unknown': it is unclear from our research whether clinical trials are taking place.
	  ○ 'none': there are no clinical trials for LDCT screening.
	  ○ 'ongoing': there are ongoing clinical trials for LDCT screening.
	• Availability and status of LDCT implementation pilots or feasibility studies taking place in the country:
	  ○ 'unknown': it is unclear from our research whether LDCT implementation pilots or feasibility studies are taking place.
	  ○ 'none': there are no LDCT implementation pilots or feasibility studies taking place.
	  ○ 'planned': there are LDCT implementation pilots or feasibility studies planned, but they have not yet begun.
	  ○ 'ongoing': there are ongoing LDCT implementation pilots or feasibility studies.
	  ○ 'complete': at least one LDCT implementation pilot or feasibility study has been completed.
	• Whether there is currently a national or regional organised LDCT screening programme for lung cancer:
	  ○ 'unknown': it is unclear from our research whether there is a national or regional organised LDCT screening programme for lung cancer.
	  ○ 'none': there is no national or regional organised LDCT screening programme for lung cancer.
	  ○ 'planned': a national or regional organised LDCT screening programme for lung cancer is planned, but has not yet been implemented.

	○ ‘ongoing’: a national or regional organised LDCT screening programme for lung cancer is in place.
National cancer control plan (NCCP)	• Whether the country has an NCCP available and, if so, the year the latest version was published e.g. ‘yes (2019)’. For countries with internal divisions of governance (e.g. United Kingdom, United States) ‘N/A’ will be used for the year, as multiple plans exist. • Whether a specific strategy for the early detection of lung cancer via screening is discussed in the latest NCCP (‘yes’ or ‘no’).
Cancer registry	• Whether there is a population-based cancer registry (PBCR) that captures cancer incidence/mortality in the country (‘yes’, ‘no’, or ‘no data’).
Screening status	The stages are displayed on the map interface as a ‘progress bar’ with the latest stage highlighted. This aims to indicate how close the country is to lung cancer screening implementation: • **Unknown status:** either no data could be identified from the literature search; or there are clinical trials or observational studies related to LDCT lung cancer screening, but no formal position at the national level is known. • **Implementation research:** the country has previously conducted or is currently conducting small-scale, regional or national implementation studies, including pilots. • **Formal commitment:** the country has formally committed to the implementation of LDCT lung cancer screening in its NCCP or other official legislation/notices. • **Implementation roll-out:** an organised LDCT screening programme is being rolled out or has previously been rolled out to the entire eligible population, either in a particular region or nationwide.

3.3 Map variables displayed on the website

Although all variables described in *Tables 1* and *2* are collected in the CSV database, the online version of the interactive map displays a narrower set of variables to keep the interface focused and user friendly (*Figures 2* and *3*).

Certain variables from the database are built into filters on the pin map and heat map (*Boxes 4* and *5*). Each filter may be used individually or in combination with others to customise the number of entries (pins) displayed on the interactive map.

Box 4. Pin map filters

- Entry status ('active' or 'inactive')
- Study/programme end date (e.g. '2010–2014', which can be customised using a slider tool)
- Geographical or political/economic region e.g. Europe, EU-27 (*Section 4.3*).
- Entry type ('clinical trial', 'implementation study', 'regional programme' or 'national programme')
- Sex of target population ('male' or 'female')
- Selection criteria are based on risk modelling ('yes' or 'no')
- People who have never smoked are eligible for screening ('yes' or 'no')
- Targeted outreach methods are used to engage high-risk groups ('yes' or 'no')
- Biomarkers (biospecimens) are collected at baseline ('yes' or 'no')
- A smoking-cessation intervention is embedded into the screening pathway ('yes' or 'no')
- CADe tools are used for clinical decision-making ('yes' or 'no')
- Data on participant outcomes (results) are available ('yes' or 'no')

Box 5. Heat map filters

- Stage of [country] along the implementation pathway ('unknown', 'implementation research', 'formal commitment' or 'implementation roll-out')
- Lung cancer mortality rate ('male' or 'female')
- Lung cancer incidence rate ('male' or 'female')

Figure 2. Variables displayed on the implementation research dashboard (pin map) with example data

1. Key information on the study/programme

Name	National Program for Early Detection of Lung Cancer	**Acronym**	WWRP	**# participants targeted**	16,000
Design	National programme	**Status**	Active	**# participants screened to date**	14,000

2. Further details on entry

Duration	2020–2025	**# sites in country**	16	**Screening interval**	Annual
Within-country region	National	**Radiation dose reported (mSv)?**	No	**Additional research focus**	Workforce capacity, Quality assurance

3. Eligibility criteria

Age range	50–74*	**Smoking history (PYs)**	20	**Never smokers eligible**	No
Sex	Both	**Smoking history (YSQ)**	15	**Other risk factors**	5

Footnotes

**Aged 55–74; OR aged 50 –74 with one additional risk factor for lung cancer listed in 'other' criteria.*

Note: An asterisk may be present on either age range or smoking history. Additional information will be presented in footnotes.

4. Participant outcomes from screening

Screening uptake	%	**Confirmed lung cancer cases***	%	**Stage I/II lung cancer cases**	%
Year results reported	N/A	** The proportion of participants who underwent baseline LDCT screening and were reported to have a true positive (confirmed) result for lung cancer after a follow-up scan and further tests.*			

Note: Participant data are displayed in the dashboard only if results are available for the selected entry.

5. Additional information

Entry last updated	2025-28-03	**Related entries**	MOLTEST BIS	**Data validated by study/programme leads**	Yes

Note: Related entries will be hyperlinked.

Figure 3. Variables displayed on the policy context dashboard (heat map) with example data

1. Stage of [country] along the lung cancer screening implementation pathway:			
UNKNOWN STATUS	IMPLEMENTATION RESEARCH	FORMAL COMMITMENT	**IMPLEMENTATION ROLL-OUT**

Short note to provide more context on the county's current stage along the implementation pathway or 'No further information currently available'.

2. Low-dose computed tomography (LDCT) screening for lung cancer	
Clinical trials	ongoing
Pilots/feasibility studies	complete
Organised screening programmes	ongoing

3. National cancer control plan (NCCP)	
Availability of NCCP	Yes
Latest NCCP published	2023
Lung cancer early detection in NCCP	Yes
Population-based cancer registry (PBCR)	Yes

4. Lung cancer [incidence/mortality] rate*	
Both sexes	30.1
Male	31.9
Female	28.5

** Global age-standardised rate of lung cancer [cases/deaths] per 100,000 population (GLOBOCAN 2022 data).*

5. Additional information			
Entry last updated	2025-04-07	**Data validated by study/programme leads**	Yes

4 Search strategy to identify studies/programmes

The implementation of LDCT lung cancer screening is an ongoing process and the landscape is continually changing. This means periodic scans of the literature are necessary to ensure that the map is up to date and continues to be a useful resource.

4.1 Peer-reviewed literature

At regular intervals, a comprehensive review of the literature will be conducted to identify studies/programmes to feature on the map for each edition published. This is based on a defined search strategy using search terms listed in *Table 3*.

The literature review uses the following search engines:

- PubMed
- Bielefeld Academic Search Engine (BASE)
- Google Scholar

As this is a global map, searches of the peer-reviewed literature are not limited to documents in the English language, but they will use appropriate Medical Subject Headings (MeSH).

Table 3. Search terms used in the search of peer-reviewed literature

ALWAYS include	"lung cancer screening"	AND [**region**]	OR [**country name**]
AND	"low-dose computed tomography"	OR "low-dose"	OR LDCT
OR	"computed tomography"	OR CT	OR CTLS
AND	diagnos*	OR "early detection"	OR "organi*ed screening"
AND	implement*	OR evaluat*	
AND	pilot OR trial	OR project	OR program*
OR	"implementation trial"	OR feasibility	OR demonstration

Other techniques to identify peer-reviewed literature

Journals relevant to lung cancer were identified through the scoping research at the start of the project. New issues of these journals will be scanned before each map update to identify literature published since the initial search strategy was applied. The approach will also involve snowballing – using references from identified papers to capture other sources and ensure the review is comprehensive.

4.2 Grey literature

In addition to scanning peer-reviewed literature, structured environmental scans of grey literature will be conducted. The aim is to find evaluations, expert commentary, reports, news

articles, trial registry entries and web pages that may describe or signpost us to implementation research around LDCT screening.

Google Search is the preferred tool to identify grey literature using the terms in *Table 3*, and the first 100 results will be screened for relevance against the inclusion criteria. Some searches may need minor amendments to the search terms if they return fewer results (e.g. searching for 'country' and 'lung cancer screening' in the language of the relevant country).

Google Alerts and social media

The Lung Cancer Policy Network Secretariat has set up Google Alerts for news articles, reports and other grey literature on lung cancer screening for regular updates of the interactive map. Social media (e.g. Twitter) are scanned daily for relevant news using hashtags including '#lungcancer', '#lungcancerscreening', '#LCSM' and '#LDCT'. Identified organisations and trending hashtags will be used to expand daily social media scans.

Professional societies and research organisations

A broader stakeholder map is being developed to guide future updates to the interactive map. Relevant findings and researcher notes will be reviewed against the inclusion criteria on a monthly basis.

The websites and newsletters of key stakeholders in lung cancer screening will also be scanned regularly for announcements or new publications. Stakeholders include patient organisations, research institutions, public health bodies and professional societies in oncology, pulmonology and radiology.

Clinical research databases

Clinical registry platforms will be searched systematically for trials, pilots and observational studies related to the implementation of LDCT screening. These platforms include the registries aggregated by the International Clinical Trials Registry Platform.

Conference proceedings

Research findings presented at cancer research conferences and webinars will be scanned regularly. Proceedings, posters and abstracts will be reviewed for announcements of new studies/programmes, as well as updates and results being published at events.

4.3 Further populating the map database

Outreach to study/programme leads

Where possible, we reach out to study/programme leads to validate the entries and obtain up-to-date information using the following process:

- Data on each study/programme are extracted from the literature identified using the search strategy, and a draft entry is prepared.
- Where it has been possible to identify contact information for study/programme leads, the draft entry is sent via email for review.
- Any feedback or additional data received undergoes review by the Network Secretariat and are incorporated into the CSV database for publication as part of the next edition of the interactive map.

A submission form is also available on the Network's website. This can be used to propose new studies/programmes for inclusion, or amendments to existing entries. Any information received via the form will be reviewed and may be published in the next edition of the interactive map. The Network will actively seek out new entries by sharing the submission form on social media and with Network members.

Amending the search strategy for the US

As detailed in *Section 2*, a different approach to the search strategy was required to map entries in the US due to the need to balance the high number of studies/programmes that meet the inclusion criteria and ensure that the interactive map remains user friendly.

Initially, eligible studies/programmes were screened and identified from two key resources for inclusion: the *Lung Cancer Screening Implementation Guide* (American Thoracic Society and American Lung Association)[1] and the International Clinical Trials Registry Platform (World Health Organization).[30]

Following this, additional entries are identified iteratively by tracking down references in the literature (snowballing). Batches of entries are then sent out to study/programme leads, who are invited to support further population of the data for each entry. The process of populating the US section of the data set will continue gradually across subsequent editions of the map.

Topology of the interactive map

At the start of the project, it was not necessary to strictly define how different countries and regions in which studies/programmes are taking place are arranged on the map interface.

However, for the second edition, an adjustment to the categories was required to improve user experience. Through desk-based research and consultation with the map developers, the following groupings and definitions were elected:

Table 4. Topology of interactive map

Grouping* (in descending order)		**Definition applied to the interactive map**	**Examples**	**Data source**
1.	Geographical region	Applies to the geographical groupings of countries into regions	Europe, Oceania	UN Geoscheme
2.	Country	Applies to internationally recognised sovereign states	UK, Canada	MapBox Boundaries adm0 level
3.	Within-country region	Applies to within-country divisions (e.g. states, provinces, devolved nations, emirates, voivodeships)	California, Wales, Sichuan	MapBox Boundaries adm1 level
4.	City	Applies to the nearest geographical, cultural and economic centre of human population	Toronto, London	N/A
5.	Primary site	Applies to the primary site/institution of the study/programme	University College London Hospital	N/A
N/A (filter)	Political/economic region	Applies to formally agreed international regions between countries (selected by researchers)	Asia-Pacific (APAC), EU-27, Group of Seven (G7), Association of Southeast Asian Nations (ASEAN), and Gulf Cooperation Council (GCC)	N/A

** The assignment of countries or regions to specific groupings is for convenience and does not imply any assumption regarding political or other affiliation of countries or territories by the Lung Cancer Policy Network. Similarly, certain groupings are defined by a third-party service (e.g. MapBox) and cannot be amended.*

Minor updates to the map

Minor updates occur on a quarterly basis (excluding quarters where major updates occur). Minor updates do not include a full review and update of current entries, although some entries may be updated. The main aim of minor updates is to ensure that new entries are added to the map on a regular basis. The search strategy is used to identify studies that have been launched since the previous literature search was conducted.

5 Contact

For further information about the map or this methodology, please contact:

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