Evidence Map: Screening for chronic obstructive pulmonary disease in the general adult population

Protocol

Produced by: Sheffield Evidence Network for Screening Synthesis (SENSS)

Produced for: UK National Screening Committee (UK NSC)

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Plain Language Summary

Chronic obstructive pulmonary disease (COPD) is a group of lung diseases. In COPD, damage to the air passages in the lungs means that less air can pass into the lungs. The two main diseases covered by COPD are chronic bronchitis and emphysema. Together these are the fifth main cause of death in the UK. Around 3 million people in the UK have COPD, but around two-thirds of these people may not realise they have it. Smoking tobacco is the main cause of COPD.

Screening people for COPD may mean it can be diagnosed and treated at an earlier stage. Tests for COPD might include breathing tests to measure how well the lungs work (such as spirometry), and questionnaires to ask patients about any difficulty breathing and whether they have ever smoked. When a patient is found to have COPD, the doctor will encourage them to stop smoking (if they smoke) and to have their vaccinations against flu and pneumonia, and may also prescribe medicines depending on how severe their COPD is.

The UK National Screening Committee (UK NSC) last looked at the research evidence for screening for COPD in 2018. The report found that studies of screening for COPD included small numbers of patients, differed a lot in the type of patients and type of tests they looked at, and gave different results about how useful screening was. It was not clear from the available studies whether being screened or having a COPD diagnosis made people more likely to give up smoking. It was also unclear how useful medicines were for people with mild COPD. There were very few studies looking at whether people who had been screened for COPD were healthier or lived longer than people who had not been screened. The report concluded that there was not enough evidence to support screening for COPD at that time.

This evidence map aims to summarise how much, and what type, of research evidence has been published since the previous report in 2018. This evidence map assesses two questions: 1) does screening for COPD improve people's health or quality of life or enable them to live longer than people who have not been screened; 2) does screening for COPD make people more likely to give up smoking?

Brief background

COPD

Chronic obstructive pulmonary disease (COPD) is a group of progressive lung conditions characterised by the inflammation and irreversible damage to pulmonary air passages that gradually reduces airflow into the lungs (1). Chronic bronchitis and emphysema are the two most common conditions in the group, and together, are the fifth leading cause of death in the UK. The prevalence of COPD remains uncertain but the previous UK NSC review suggested that up to 3 million people are affected. Approximately two thirds of this population remain undiagnosed (2). The main symptom of COPD is increasing breathlessness when active. Persistent coughs with phlegm are common; however, airflow obstruction without symptoms is also common. If left untreated, the conditions will progressively impair quality of life resulting in long-term disabilities and increased mortality. Smoking tobacco has been shown to be the main cause of COPD and is responsible for 80-90% of cases. Epidemiological studies have found that 15-50% of all smokers will develop COPD (3).

Tests for COPD
The function of a national screening programme would be to identify people with COPD when the disease is in an asymptomatic or unrecognised stage, and to offer treatments and interventions to reduce the rate of lung function deterioration. Tests for COPD include lung (pulmonary) function tests such as spirometry; risk assessment questionnaires; or a combination of these.

Management of COPD
In terms of management, encouragement to quit smoking is the primary intervention recommended by NICE for COPD. Oral and inhaled pharmacological therapies can reduce exacerbations in moderate-to-severe COPD. COPD patients are also recommended to receive pneumococcal and annual influenza vaccinations.

Previous (2018) UK NSC review
The last UK NSC evidence summary on screening for COPD was published in 2018 and includes studies published between February 2012 and November 2017 (3). It assessed four key questions. The first question assessed accuracy of screening tests for COPD. Risk assessment questionnaires gave a high number of false positives, while pulmonary function tests (alone or in combination with questionnaires) may reduce the false positive rate, but studies were small with considerable variation in populations, tests, cut-offs and results. The second question assessed the impact of screening on smoking cessation rates; one RCT and three uncontrolled cohort studies were included. Overall there was uncertainty about the impact of spirometry or a COPD diagnosis on smoking cessation rates. The third question assessed the clinical effectiveness of pharmacological treatments in screen-detected COPD. No studies were identified in screen-detected populations, and there was a lack of evidence on pharmacological interventions in people with milder COPD. The fourth question assessed the impact of COPD screening on mortality, morbidity or health-related quality of life (HRQoL). One cluster randomised controlled trial (RCT) assessed screening versus usual care in a frail elderly population, and did not demonstrate an advantage for screening, but significance tests were not reported and the population may not be generalisable to population screening. Overall the review found insufficient evidence to recommend screening for COPD.

Current guidance
Currently, the UK NSC recommends against screening for COPD. In the UK, diagnosing and managing COPD is covered by the NICE guideline NG115 (4). The United States Preventive Services Task Force (USPSTF) evidence review in 2016 did not recommend screening for COPD due to a lack of evidence that screening in asymptomatic people alters the course of disease or improves patient outcomes (5). A USPSTF targeted evidence update in 2022 concluded that there were still no comparative studies on the effectiveness of screening or active case-finding for COPD on patient health outcomes, and that there was little evidence for a benefit of pharmacologic or non-pharmacologic interventions in people with mild COPD (6).

Aims

The aim of this evidence map is to provide an overview of the volume and type of evidence that has become available since the 2018 UK NSC review, relating to screening for COPD in previously undiagnosed adults, including general populations (for example, based on age alone)

and targeted populations (for example, based on smoking status). The review questions are as follows:

Question 1: What is the volume and type of evidence on the effect of screening for COPD in previously undiagnosed adults on morbidity, mortality and health-related quality of life?

Question 2: What is the volume and type of evidence on the effect of screening for COPD in previously undiagnosed adults on smoking cessation rate?

Methods

Search strategy

The search strategies below will be run on Ovid MEDLINE and translated for EMBASE and the Cochrane Library. We estimate that the total retrieval across all databases will be between 2.5x and 3x the numbers below. The search for Q1 combines terms for COPD and specific tests and screening (or COPD and screening or case-finding in the title) plus relevant outcome terms. The search for Q2 combines terms for specific tests (or COPD and screening or case-finding in the title) plus terms for smoking cessation. Both searches are limited to English language, humans and the year 2017 onwards, and non-relevant publication types excluded.

Search strategy: Ovid MEDLINE(R) Epub Ahead of Print and In-Process, In-Data-Review & Other Non-Indexed Citations and Daily <July 11, 2025>

Search terms	Search concept
1 *chronic obstructive lung disease/ or Pulmonary Disease, Chronic Obstructive/ 56092 2 (copd or chronic obstructive pulmonary disease).tw. 88742 3 ((airflow or airway) adj (obstruction or liitation)).tw. 28300 4 1 or 2 or 3 115091	COPD terms
5 *spirometry/ 5204 6 (spiromet* or bronchospiromet*).tw. 28782 7 *lung function test/ 11363 8 ((respiratory or lung or pulmonary) adj function test*).tw. 21183 9 (((respiratory or lung or pulmonary) adj5 (screen* or assess* or evaluat* or function)) and questionnaire?).tw. 10046 10 *Respiratory Function Tests/ 11363 11 (COPD Diagnostic Questionnaire or Lung Function Questionnaire or COPD Population Screener or "COPD Assessment in Primary Care to Identify Undiagnosed Respiratory Disease and Exacerbation Risk" or (CAPTURE and COPD and screening)).tw. 89 12 5 or 6 or 7 or 8 or 9 or 10 or 11 62688	Tests terms
13 mass screening/ 122070 14 screen*.tw. 1122793 15 (case finding or case-finding).tw.6348 16 13 or 14 or 15 1157438	Screening terms

17	(screen* or case-finding or case finding*).ti. 243781	
18	4 and 17 867	COPD AND screening/case finding in title
19	4 and 12 and 16 1230	COPD AND tests AND screening
20	18 or 19 1744	(COPD AND screening/case finding in title) OR (COPD AND tests AND screening)
21 22 23 24 25 26 27 28 29 30 31 32 33	exp mortality/ 443007 *disease course/ or *adverse outcome/ or *chronicity/ or *disease exacerbation/ or *illness trajectory/ or exp *prognosis/ or exp *survival/ 69223 *"quality of life"/ 126806 (mortality or survival or morbidity).ti,ab. 2436818 ((copd or chronic obstructive pulmonary disease) adj5 (prognos* or progress* or sever* or exacerbat* or "quality of life" or qol)).ti,ab. 24216 (prognos* or progress* or sever* or exacerbat* or "quality of life" or qol).ti. 882735 *Hospitalization/50593 *Pneumonia/ 41195 acute respiratory illness*.ti,ab. 2177 (hospitali?ed or hospitali?ation*).ti,ab. 386756 (hospital and (visit* or admission* or admit*)).ti,ab. 337889 (exacerbat* and symptom*).ti,ab. 30053 or/21-32 3841364	Outcome terms
34	20 and 33 634	Q1 results (COPD AND screening/case finding in title) OR (COPD AND tests AND screening) AND Outcomes
35 36 37	Smoking Cessation/ 34588 ((smok* or "tobacco use") adj2 (cessation or quit* or stop or "give up")).ti,ab. 41953 35 or 36 54268	Smoking cessation terms
38	12 and 37 956	Tests AND smoking cessation
39	4 and 17 and 37 83	COPD AND screening/case finding in title AND smoking cessation
40	38 or 39 985	Q2 results Tests AND smoking cessation

			OR COPD AND screening/case finding in title AND smoking cessation
41	34 or 40	1537	Combined results Q1 Q2 to avoid duplication
42 471	limit 41 to (english language and humans and yr="2017 -Current")		Limits applied
43 44 45 46 47	Letter/ Editorial/ Comment/ congress.pt. 43 or 44 or 45 or 46	1301997 731167 1053028 68246 2404927	Publication types to exclude
48	42 not 47	**465**	Combined results Q1 Q2 to avoid duplication With date, language and human studies limits applied Excluding letters, comments, editorial, conference abstracts

Inclusion criteria

Inclusion criteria for all questions are provided in the table below.

Table: Inclusion criteria for evidence map of screening for COPD

Question	**1. Effect of screening for COPD in previously undiagnosed adults on morbidity, mortality and health-related quality of life**	**2. Effect of screening for COPD in previously undiagnosed adults on smoking cessation rate**
Population	•People with no previous COPD diagnosis (who do not recognise or report respiratory symptoms), in the following groups: o All populations (for example, based on age) o Targeted populations (for example, based on smoking history)	•Same as for Q1
Setting	•UK (regional or national) •Western countries analogous to the UK (Europe, US, Canada, Australia, New Zealand)[a]	•Same as for Q1
Intervention (screening)	Screening using any combination of: •Risk assessment questionnaires •Lung (pulmonary) function tests, such as spirometry without bronchodilator •Combination of above tests Include: Studies of case-finding, where this is considered to be synonymous with screening.	•Same as for Q1
Comparator	•No screening (standard care)	•Same as for Q1

Question	1. Effect of screening for COPD in previously undiagnosed adults on morbidity, mortality and health-related quality of life	2. Effect of screening for COPD in previously undiagnosed adults on smoking cessation rate
Outcomes	•Mortality •Morbidity o Physical health measures o Frequency of COPD exacerbations o Speed of progression of disease through the 4 GOLD clinical stages •HRQoL •Test uptake (secondary outcome, only to be obtained from studies included for Q1 or Q2) **Exclude:** Studies reporting only diagnostic and process outcomes (e.g. % referred, % diagnosed, % receiving treatments, feasibility, acceptability)	•Smoking cessation rate •Test uptake (secondary outcome, only to be obtained from studies included for Q1 or Q2)
Study designs	•RCTs •Controlled experimental and quasi experimental studies •Controlled cohort and observational studies •Systematic reviews of the above	•RCTs •Experimental and quasi experimental studies (controlled or uncontrolled) •Cohort and observational studies (controlled or uncontrolled) •Systematic reviews of the above
Publication types	•Full publications only (exclude conference abstracts) •Publications with results only (exclude protocols and trial registries)	•Full publications only (exclude conference abstracts) •Publications with results only (exclude protocols and trial registries)
Date limit	Since Nov 2017	Since Nov 2017
Language	English language	English language

[a]Includes: European Economic Area (EEA, i.e. 27 EU countries plus Iceland, Liechtenstein, Norway and Switzerland); United States, Canada, Australia, New Zealand.
COPD, chronic obstructive pulmonary disease; GOLD, Global Initiative for Chronic Obstructive Lung Disease; HRQoL, health-related quality of life; RCT, randomised controlled trial.

Screening of Titles and Abstracts

Titles and abstracts will be screened for relevance by the reviewer team. The first 100 references will be screened by all reviewers, then checked for consistency of inclusion decisions in order to align interpretation of the inclusion criteria. If agreement is low then this process will be repeated. The remaining titles and abstracts will each be screened by a single reviewer (within a team of two to three reviewers). In cases where there is uncertainty about inclusion, a second reviewer will be consulted.

Full texts will only be obtained and consulted where the abstract suggests that the study is likely to meet inclusion criteria and to report relevant data such as mortality, morbidity, health-related quality of life, or smoking cessation rate, but where insufficient information is available from the abstract to either assess eligibility or extract data.

Data Extraction

Data will be extracted from abstracts where possible. Full texts will only be checked to clarify unclear information from the abstract. Where relevant outcome data are reported in the abstract, full texts will not be routinely checked for additional data.

Data will be extracted by one reviewer and numerical data checked by a second reviewer.

Data extraction will focus on the following essential information for each study (as in Appendix 2 of the UK NSC Evidence Map template):

- Study type
- Objectives of the study
- Components of the study (e.g. PICO)
    - For Q1 and Q2: Population (and N), country/setting, screening test, comparator.
- Outcomes reported and brief results on these outcomes
    - For Q1: Mortality, morbidity, health-related quality of life, and difference between groups on these outcomes, test uptake
    - For Q2: Smoking cessation rate, test uptake
- Conclusions of the study.

Depending on the number of studies, data will either be extracted directly into the UK NSC Evidence Map template Appendix 2 (structured summary per study), or be extracted initially into an Excel table for ease of extraction and to ensure consistency across studies, then into tables in Word.

Quality assessment

No formal quality assessment will be conducted (consistent with the NIHR-NSC Evidence Map Process Document). Any obvious quality issues evident from the data available in the abstracts will be highlighted through the narrative review of the studies.

Reporting

The evidence map will be constructed in accordance with the UK NSC Evidence Map template. This will include:

- Summary section and brief recommendations regarding further work
- Background and objectives
- Brief summary of the previous UK NSC review
- Aims and research questions
- Search methods and search results with PRISMA flow charts
- Summary of findings per question
- Conclusions
- Recommendations regarding further work
- Appendix 1 with details of search strategies and inclusion criteria
- Appendix 2 with structured summary of each included study
- References.

The “Summary of findings per question” will summarise the volume and type of evidence published since the previous UK NSC review and the results of the included studies. This section

will also briefly summarise the results and limitations of the evidence identified within the previous UK NSC review.

Outputs

The main output will be a report for the UK NSC as described above. We are happy to discuss further publication and dissemination activities with the UK NSC.

Project team

The project team will include:

- Project lead: Katy Cooper
- Systematic reviewers: Katy Cooper, Yashwini Chandrawat, possibly a third reviewer (depending on search numbers and timescales)
- Information specialist: Anthea Sutton

The systematic reviewers will undertake regular meetings and checks to ensure consistency of understanding and processes.

Timelines

Timelines for the evidence map are provided in the table below.

Table 6: Timelines for evidence map

Task	Timepoint	Date
Initial meeting	**Start**	**16 June 2025**
Protocol and draft literature searches to UK NSC Evidence Team for feedback	Start of Week 5	14 July 2025
Literature searches agreed by UK NSC Evidence Team	Middle of Week 5	15 July 2025
Literature searches run	Middle of Week 5	16 July 2025
Sifting titles/abstracts and study selection	End of Week 7	31 July 2025
Katy away 11-22 August Yashwini away 5-13 August, remote working either side	Week 8 Week 9 Week 10	4-22 Aug
Data extraction and tabulation	End of Week 13	12 Sept 2025
Report writing	End of Week 15	26 Sept 2025
Draft evidence map	**End of Week 15**	**26 Sept 2025**
Feedback from UK NSC Evidence Team	End of Week 16	3 Oct 2025
Updated evidence map	End of Week 17	10 Oct 2025
Feedback from Reference Group	tbc	tbc

Updated evidence map	tbc	tbc
Public consultation (3 months)	tbc	tbc
UK NSC Meeting	tbc	tbc
Updated evidence map	tbc	tbc

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References

1. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. 2023.
2. Public Health England (PHE). UK NSC recommendation on adult screening for Chronic Obstructive Pulmonary Disease (COPD). 2018.
3. UK National Screening Committee (UK NSC) and Solutions for Public Health. Screening for chronic obstructive pulmonary disease (COPD) in the general adult population - External review against programme appraisal criteria for the UK National Screening Committee. 2018.
4. National Institute for Health and Care Excellence (NICE). Chronic obstructive pulmonary disease in over 16s: diagnosis and management. NICE guideline [NG115]. 2018 (updated 2019).
5. Guirguis-Blake JM, Senger CA, Webber EM, Mularski RA, Whitlock EP. Screening for Chronic Obstructive Pulmonary Disease: Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA. 2016;315(13):1378-93.
6. Webber EM, Lin JS, Thomas RG. Screening for Chronic Obstructive Pulmonary Disease: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force. JAMA. 2022;327(18):1812-6.