

Primary prevention of asthma and chronic obstructive pulmonary disease at the primary healthcare level: rapid review

This document is a supplement to the rapid policy brief on the issue

Contributions of authors

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Competing interests

The authors do not have any relevant competing interests.

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List of abbreviations

BTS	British Thoracic Society
COPD	Chronic Obstructive Pulmonary Disease
CRD	Chronic Respiratory Disease
GINA	Global Initiative for Asthma
GOLD	Global Initiative for Chronic Obstructive Lung Disease
ICS	Indian Chest Society
LMICs	Low- and middle-income countries
NCCP	National College of Chest Physicians
NCD	Non Communicable Disease
NICE	National Institute for Health and Care Excellence, UK
PHC	Primary Health Care
PICO	Population, Interventions, Comparisons and Outcomes
WHO	World Health Organization

Executive Summary

Background: Chronic respiratory diseases such as asthma and chronic obstructive pulmonary disease, are increasing in incidence rapidly in low- and middle-income countries (LMICs). Asthma is characterised by recurrent episodes of wheezing, breathlessness, chest tightness and cough that is often reversible. Pharmacological interventions to treat established asthma and COPD are highly effective in controlling symptoms and improving quality of life; however, it is imperative to prevent the onset of these diseases in the first place. The State Health Resource Centre (SHRC) in Raipur, identified that there is a high burden of asthma and COPD in Chhattisgarh. The objective of this report was to conduct a rapid overview of evidence from guidelines and provide a summary of the recommendations to help inform policy decision-making on the primary prevention of asthma and COPD.

Methods: A rapid review of guidelines was undertaken, published mainly by norm-setting institutions from different countries that could be adapted within an LMIC context. A comprehensive search for evidence was undertaken in electronic databases, and unpublished literature sources. Following established methods for study selection and based on the pre-specified inclusion criteria, 13 guidelines in total were included in this report. Eight guidelines relate to primary prevention of asthma and five relate to primary prevention of COPD. Overall, the recommendations in the guidelines did not vary but focussed on slightly different aspects of prevention or different risk factors. The recommendations from the guidelines were contextualised to Indian setting and tailored to make them more policy relevant.

Findings: Tobacco smoking, indoor cooking with biomass fuels, and exposure to hazards including pollutants are important causes of asthma and COPD in LMICs. However, these factors are highly preventable or modifiable. Environmental tobacco smoke exposure perinatally has an adverse influence on lung health and wheezing in infants and therefore, should be strongly discouraged to prevent the onset of asthma. Maternal education and counselling on effects of smoking and exposure to smoke, healthy diet and nutrition, breastfeeding, and avoidance of exposure to allergens in children appear to be feasible primary preventive measures for asthma in LMICs like India. Smoking cessation, avoidance of exposure to hazards, and healthy lifestyle including regular physical activity, coupled with advice and/or education and counselling appear to be key primary preventive measures for COPD in LMICs. In addition, for COPD, improvement in or modification of cooking methods may help in preventing the onset of COPD.

Conclusion: Overall, the recommendations from the guidelines for primary prevention of asthma and COPD appear to be feasible and could be implemented even in low-resource settings. However, there is a knowledge gap in terms of the cost-effectiveness of each of the proposed preventive measures to prioritise and allocate resources accordingly.

1. Background

Chronic respiratory diseases (CRD), such as bronchial asthma and chronic obstructive pulmonary disease (COPD) are recognised as a major public health burden, more so in low- and middle-income countries (LMICs).(1) The lack of availability of health workers and the need to prioritise resources at the primary health care (PHC) level make it more challenging to prevent and manage these conditions.(1) A recent report from the State-Level Disease Burden Initiative CRD Collaborators in India on the trends in the burden of CRDs showed that there was an increase in prevalence of COPD and asthma in the last three decades.(2) The total number of cases reported in 2016 for COPD was 55.3 million and for asthma 37.9 million.(2)

Asthma is a common CRD characterised by chronic airway inflammation. People affected with asthma typically show symptoms of wheeze, shortness of breath, chest tightness, and cough.(3) Risk factors for asthma include modifiable and non-modifiable risk factors. Modifiable risk factors related to mother that may increase the risk of asthma include smoking, paracetamol use, obesity, and antibiotic use. Other modifiable risk factors that may increase the risk of asthma in early and late childhood include outdoor air pollution, exposure to allergens, cigarette smoke, obesity, lifestyle (less physical activity), diet and nutrition.(3, 4)

Chronic obstructive pulmonary disease is a common, preventable disease characterised by persistent respiratory symptoms and airflow limitation, which are generally caused by significant exposure to noxious particles or gases.(5) Risk factors for COPD include tobacco smoking (including smoking during pregnancy), occupational exposures (e.g. chemical industries), environmental (indoor pollution from biomass cooking and heating), a history of severe childhood respiratory infection, and tuberculosis (TB).(5)

The World Health Organization (WHO) suggested that prevention and control of asthma and COPD should be addressed through the implementation of key interventions at a PHC level.(1) Primary prevention refers to the measures taken to prevent the onset of the disease before it occurs or to reduce its incidence.(4, 6) These measures may include but not limited to preventing exposures to hazards (organic or inorganic dusts, chemical agents) causing disease, modifying unhealthy behaviours (smoking cessation, exercise, diet and nutrition) that can lead to the disease, and increasing resistance to disease should exposure occur (immunisation, food supplements).(6)

The SHRC in Raipur, identified that there is a high burden of asthma and COPD in Chhattisgarh, particularly in areas with high levels of industrial pollution. Therefore, the Centre requested for a rapid summary of guideline recommendations to help inform decision-making. Rapid evidence synthesis (RES) is a pragmatic form of research synthesis that is intended to inform and guide specific decision-making needs of policy-makers in a time-efficient manner.

The RES aims to provide a summary of the best available research evidence, contextualised to local evidence and actual requirements of decision making, where possible. The overall objective of this RES was to identify and summarise the recommendations from relevant guidelines from norm-setting institutions on interventions or strategies to prevent the development of asthma and COPD in PHC settings, with some relevance to LMICs.

Review question/s

- What are the current recommendations from guidelines regarding interventions or strategies for primary prevention of asthma in primary healthcare settings that can be adapted in low- and middle-income countries?
- What are the current recommendations from guidelines regarding interventions or strategies for primary prevention of COPD in primary healthcare settings that can be adapted in low- and middle-income countries?

2. Methods

This section describes the methods used in the development of the policy brief.

Inclusion Criteria (PICO)

We included guidelines which met the following criteria.

Population

Children and adolescents, aged ≤ 18 years with asthma; and adults and older adults ≥ 18 years with COPD.

Domain

Guidelines that explicitly reported on preventive strategies for asthma and COPD in PHC settings were considered for inclusion.

The following preventive strategies and/or programs for asthma were considered:

- Avoidance of exposure to environmental tobacco smoke during pregnancy or after birth
- Nutrition (including dietary intake and supplements)
- Breastfeeding
- Environmental control (e.g. for house dust mites)
- Avoidance of indoor and outdoor pollutants
- Education and counselling

The following preventive strategies and/or programs for COPD were considered:

- Lifestyle modifications (smoking cessation)
- Vaccinations (influenza)
- Prophylactic antibiotics
- Physical activity

- Education and counselling

Outcome/s

Outcomes of interest for asthma and COPD, as reported in the guidelines, which may include but not limited to: reduction in severity and frequency of symptoms (wheeze, cough, breathlessness), quality of life (QoL), and any adverse effects.

Study designs

Guidelines from relevant norm-setting institutions at national and global level, which may include best practices and/or practice guidelines, published in the last 10 years were considered for inclusion for comprehensiveness, recency and relevancy.

Setting

Global evidence with a specific focus on LMICs was considered, where available.

Search methods

A comprehensive search was conducted in electronic databases such as PubMed and EMBASE. Search strategies for these two databases are provided in Appendix 1 separately for asthma and COPD. Unpublished literature from various sources including relevant organisation websites were searched for identifying guidelines. These included WHO; Global Initiative for Chronic Obstructive Lung Disease (GOLD); Global Initiative for Asthma (GINA); Guidelines International Network (GIN); and Indian Chest Society (ICS). The search was restricted to guidelines published in English language in the past 10 years for recency and relevancy, with a focus on LMIC context.

Study selection, data collection, and reporting

The following steps were undertaken following search for the guidelines:

- Study selection (full-text examination) for potential inclusion;
- Relevant recommendations were extracted on primary prevention from each guideline;
- Guideline recommendations were summarised and reported for different types of preventive strategies.

3. Results

The results section presents an overview of the recommendations separately for asthma and COPD.

Asthma

This section provides a summary of the recommendations from relevant guidelines on preventing asthma from developing in children and adolescents who do not already have a diagnosis of asthma (primary prevention). The recommendations in the guidelines for primary prevention strategies are based predominantly on observational studies (with a few experimental studies). Further, the guidelines recommended that no single strategy is effective, and instead multiple strategies should be implemented to prevent the onset of asthma and or reduce its incidence.

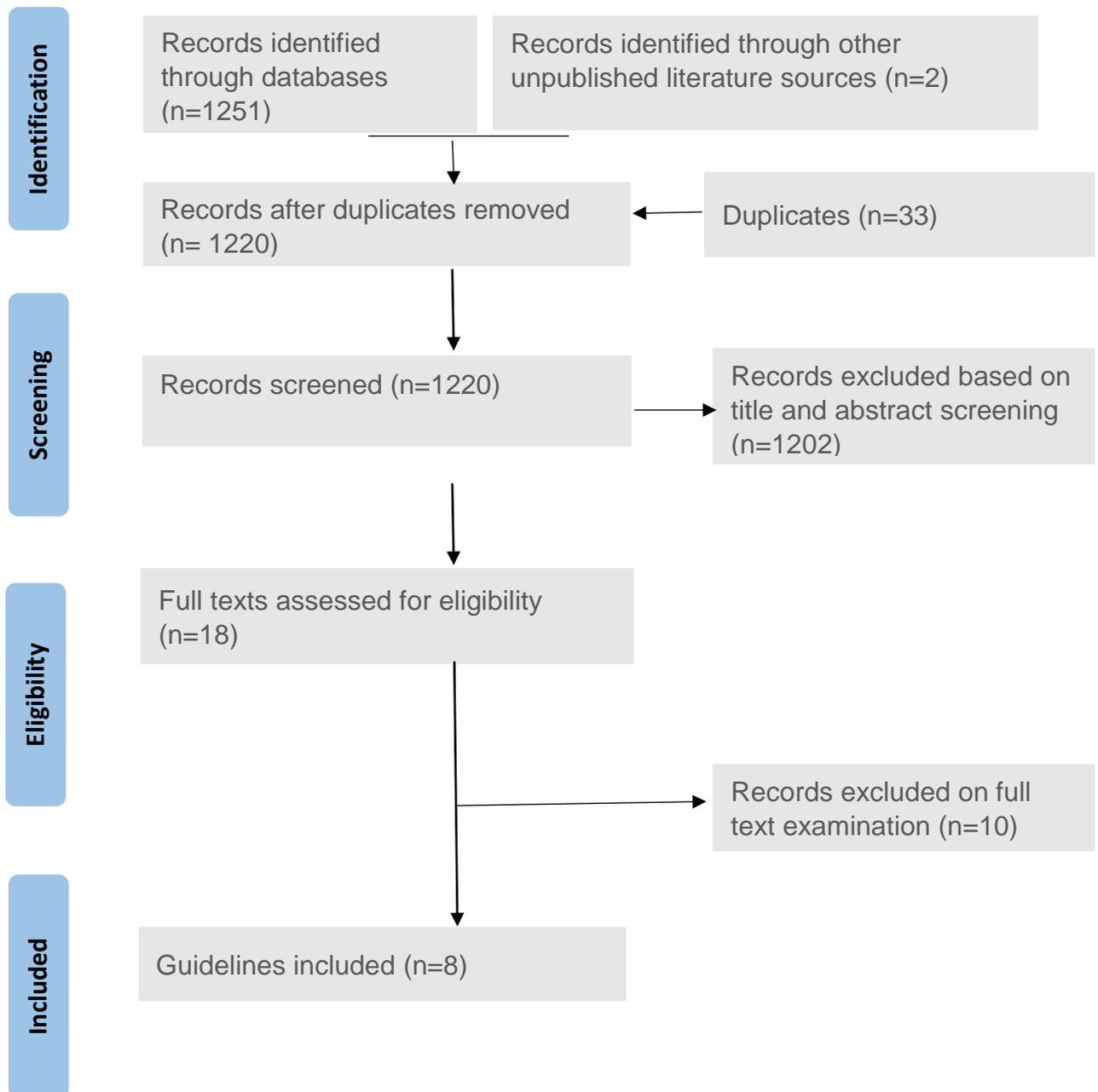
Description of characteristics of included guidelines

Search results and study selection

The search for best practice guidelines yielded 1251 documents. Two additional guidelines were identified from unpublished literature search. The initial title and abstract screening excluded most of these documents due to their limited specificity (i.e., focus on diagnosis, treatment, management, etc.) and lack of guidelines or recommendations in the documents (e.g., opinion focused, or primary study type).

Eighteen guidelines remained after the initial screening for potential inclusion, which were then examined further in detail. Following full text examination of these guideline reports, eight guidelines from 2012 to 2019 were included in the report. Figure 1 shows the flow diagram for the search and study selection process.

Figure 1 PRISMA Study Selection Flow Chart (Asthma)



Summary of included guidelines

The guidelines that focussed on various aspects of asthma prevention were from the WHO;(1) Global Initiative for Asthma (GINA);(3) Scottish International Guidelines Network (SIGN)/British Thoracic Society (BTS);(4) National Asthma Council, Australia;(7) Philippine Society of Allergy, Asthma and Immunology (PSAAI)/Philippine Society for Pediatric Gastroenterology, Hepatology and Nutrition (PSPGHAN);(8) Indian Chest Society/National College of Chest Physicians;(9) The Japanese Society of Pediatric Allergy and Clinical Immunology (JSPACI);(10) and the Chinese Thoracic Society (CTS).(11)

All the included guidelines were based on an exhaustive review of evidence (mostly systematic reviews, randomised controlled trials, and cohort studies) and involved a multi-disciplinary expert working group. Majority of these guidelines addressed various aspects of primary prevention with some relevance to LMICs. The WHO guideline(1) provided specific recommendations relevant to resource-limited settings and/or LMICs. The scope of the guidelines did not vary significantly. Majority of the recommendations related to prevention in the guidelines were graded as strong recommendations but based on low quality evidence, mostly from observational studies. Other recommendations were based on consensus of guidelines' review panel. Table 1 provides a snapshot of the existing guidelines published by different norm-setting institutions, in different countries.

Table 1 A snapshot of the guidelines on prevention of asthma (in the descending order of publication year)

Guideline organisation, year	Guideline objective	Target users of the guideline
GINA, Global 2019(3)	To review published research and provide recommendations on asthma management and prevention	Health professionals, health authorities, and the general public, worldwide.
BTS/SIGN, UK 2019(4)	To provide recommendations based on current evidence for best practice in the diagnosis, management and prevention of asthma	Healthcare professionals involved in the care of people with asthma including general practitioners, consultants and specialists in respiratory medicine, nurses, pharmacists and other allied health professionals. Also, people with asthma, their parents and carers; those who interact with people with asthma outside of the NHS, such as teachers, voluntary organisations with an interest in asthma, and those planning the delivery of services.

NAC, Australia 2019(7)	To provide guidance and information about asthma prevention in people who do not already have a diagnosis of asthma (primary prevention)	Patients and healthcare professionals involved in the care of people without a prior diagnosis of asthma
PSAAI/PSPGHAN, Philippines 2017(8)	To provide evidence-based recommendations for the dietary primary prevention of allergic diseases (including asthma) in children	All healthcare practitioners who manage patients with potential allergic conditions
ICS/NCCP, India 2015(9)	To provide evidence-based recommendations for diagnosis and management of bronchial asthma	General and pulmonary physicians at all levels of healthcare involved in the care of patients with asthma
JSPACI, Japan 2014(10)	To provide recommendations for treatment, prevention and management of bronchial asthma	Clinicians treating childhood asthma, paediatricians
CTS (China), China 2013(11)	To standardise the diagnosis and treatment of asthma and to raise the awareness of asthma prevention at the community level	Primary health care professionals
WHO, Global 2012(1)	To provide evidence-based recommendations on management of asthma in primary health care in low-resource settings	Physicians and health workers in primary health care in low-resource settings

GINA – Global Initiative for Asthma; BTS – British Thoracic Society; SIGN - Scottish Intercollegiate Guidelines Network; NAC – National Asthma Council, Australia; PSAAI - Philippine Society of Allergy, Asthma and Immunology; PSPGHAN - Philippine Society for Pediatric Gastroenterology, Hepatology and Nutrition; ICS - Indian Chest Society; NCCP - National College of Chest Physicians; JSPACI - The Japanese Society of Pediatric Allergy and Clinical Immunology; CTS - Chinese Thoracic Society; WHO – World Health Organization

A summary of the recommendations from all the included guidelines focussing on key areas of interest related to primary prevention of asthma is provided below.(1, 3, 4, 7-12) Overall, the guidance and recommendations provided in the various guidelines do not vary in terms of the target population, health professionals and care in primary prevention. The guidelines from GINA(3) and WHO(1) provide recommendations that are also appropriate and relevant to LMIC context. The guideline from the Indian Chest Society/National College of Chest Physicians(9) has a major focus on diagnosis and management in relation to secondary and tertiary prevention, with very minimal recommendations on primary prevention.

Primary prevention

- Some guidelines state that the gene-environment interactions may be responsible for increase in the risk of asthma, and therefore, preventive measures should be taken during the perinatal period and in early childhood life to prevent the onset of asthma. (1, 3, 4)
- Primary prevention of asthma requires that exposure to common risk factors be avoided during pregnancy and childhood.
- Direct and indirect exposure to tobacco smoke should be avoided.
- Primary prevention should include aspects of education on health, nutrition and environment of the pregnant woman and newborn child.
- Pregnant women should be advised not to smoke and should be provided support to help them quit. Pregnant women should also be advised to avoid exposure to environmental tobacco smoke.
- Pregnant women should be advised to avoid unnecessary paracetamol (e.g. acetaminophen) use. However, if paracetamol use is indicated in children for managing fever or pain, parents should be advised of the recommended doses according to current guidelines.
- Exclusive breastfeeding for at least six months should be advised where possible for its overall health benefits. Parents and carers should be encouraged to introduce a variety of solid foods around 6 months, while continuing to breastfeed.
- Modified infant milk formulae (hydrolysed formula or soy formula) should not be recommended over breast milk, or standard formula (where breastfeeding is not possible), particularly for infants at high risk of asthma (e.g. family history of asthma).
- Dietary restrictions should not be recommended for breastfeeding women to prevent asthma in their children.
- There is a lack of evidence to recommend influenza vaccination for patients with asthma.
- Routine use of dietary supplements (e.g. prebiotics/probiotics, vitamins, fish oil) as an asthma-prevention strategy is not recommended for breastfeeding women or for infants.
- Obese and overweight children should be encouraged to alter their lifestyle that may include physical activity, exercise and diet to reduce the likelihood of respiratory symptoms suggestive of asthma.
- Exposure to single or specific allergens during pregnancy or early childhood, such as house dust mites or pets, or single food allergens, is not recommended for the primary prevention of asthma.

COPD

This section provides a summary of the recommendations from relevant guidelines on preventing COPD in adults who do not already have a diagnosis of COPD (primary prevention). The guidelines recommend multiple strategies to prevent the onset of COPD.

Description of characteristics of included guidelines

Search results and study selection

The search for best practice guidelines yielded 1588 documents. Two additional guidelines were identified from unpublished literature search. Following initial title and abstract screening and removal of duplicates, 12 guidelines remained for potential inclusion, which were then examined further in detail. Following full text examination of these guideline reports, five guidelines from 2012 to 2020 were included in the report. The guidelines that were excluded on full text examination were mainly due to most of these documents being of limited relevance to the topic of interest (i.e. focus on diagnosis, treatment, management, etc.) or setting. Figure 2 shows the flow diagram for the search and study selection process.

Summary of included guidelines

The five guidelines that focussed on various aspects of COPD prevention were from the WHO;(1) Global Initiative for Chronic Obstructive Lung Disease (GOLD);(5) Korean Academy of Tuberculosis and Respiratory Diseases (KATRD);(13) Indian Chest Society (ICS)/National College of Chest Physicians (NCCP);(14) and South African Thoracic Society (SATS).(15) All the included guidelines were based on a comprehensive review of evidence and involved a multi-disciplinary expert working group. Similar to the guidelines on asthma prevention, majority of the guidelines on COPD addressed various aspects of primary prevention with some relevance to LMICs. The WHO guideline(1) was more relevant to resource-limited settings and/or LMICs. The scope of the guidelines did not vary significantly. Majority of the recommendations related to prevention in the guidelines were graded as strong recommendations but based on low quality evidence, mostly from observational studies. Other recommendations were based on consensus of guidelines' review panel.

Figure 2 PRISMA Study Selection Flow Chart (COPD)

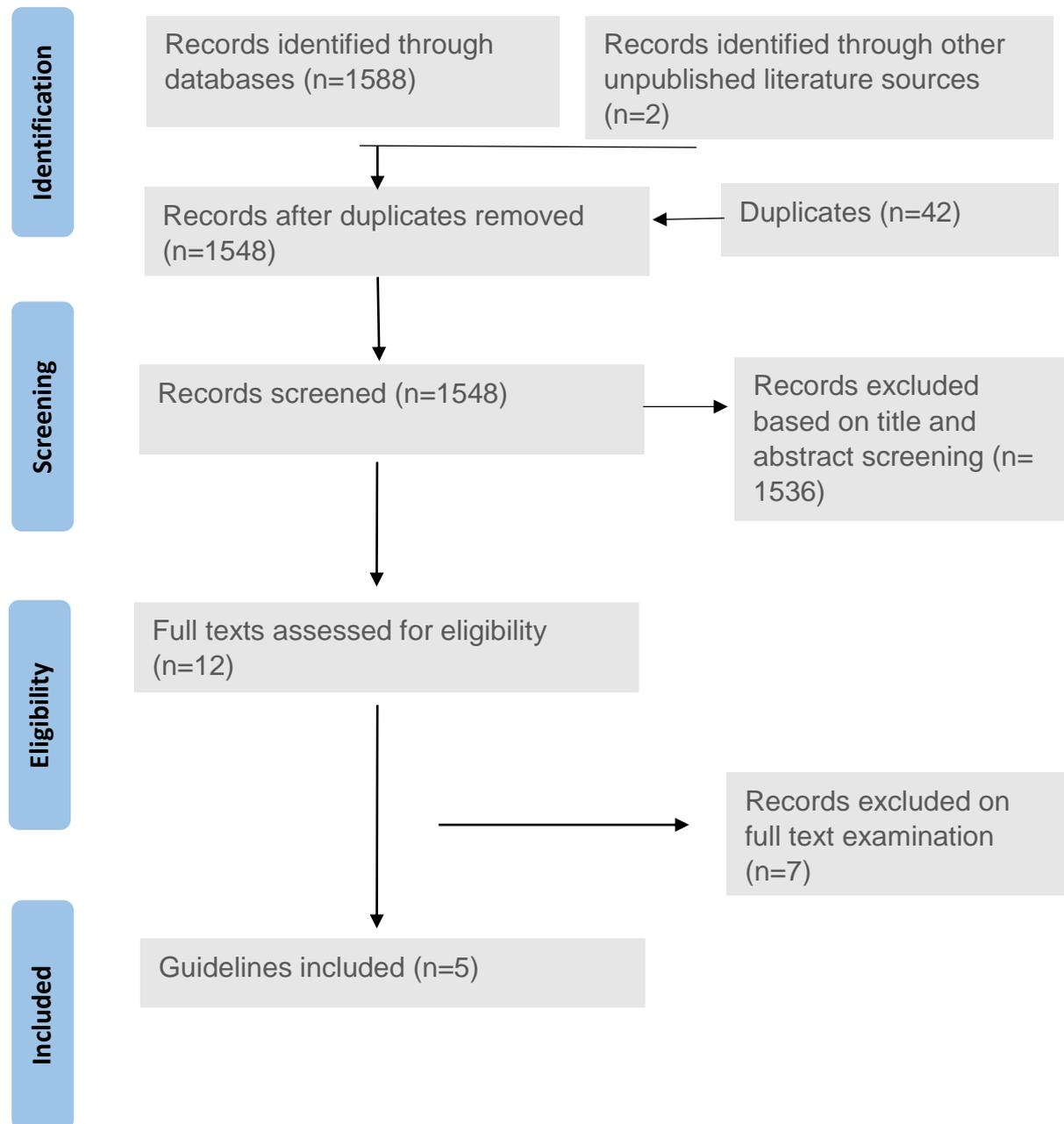


Table 2 provides a snapshot of the existing guidelines on COPD prevention published by different norm-setting institutions, in different countries.

Table 2 A snapshot of the guidelines on prevention of COPD (in the descending order of publication year)

Guideline organisation, year	Guideline objective	Target healthcare professionals/workers
GOLD, Global 2020(5)	To review published research on prevention and management of COPD	Health professionals, health authorities, and the general public.
KATRD, South Korea 2018(13)	To provide recommendations on a wide range of topics related to COPD, including prevention	Medical doctors treating patients with respiratory conditions, health care professionals and government personnel in South Korea
ICS/NCCP, India 2013(14)	To provide evidence-based recommendations for diagnosis, prevention and management of COPD	General and pulmonary physicians at all levels of healthcare involved in the care of patients of COPD
SATS, South Africa 2011(15)	To provide evidence-based recommendations for diagnosis, prevention and management of COPD	Health professionals involved in the care of patients with COPD
WHO, Global 2012	To provide evidence-based recommendations on management of COPD in primary health care in low-resource settings	Physicians and health workers in primary health care in low-resource settings

GOLD - Global Initiative for Chronic Obstructive Lung Disease; KATRD - Korean Academy of Tuberculosis and Respiratory Diseases; ICS - Indian Chest Society; NCCP - National College of Chest Physicians; SATS - South African Thoracic Society; WHO – World Health Organization

A summary of recommendations from all the included guidelines focussing on key areas of interest related to primary prevention of COPD is provided below.(1, 5, 8, 13, 14)

Primary prevention

- Identification and reduction of exposure to risk factors are important elements in the prevention of COPD. People should be advised and must be fully informed about maintaining healthy lifestyle (including healthy nutritional habits), regular exercise and avoidance of tobacco, airway irritants and allergens.
- Smoking (including different forms of tobacco such as cigarettes, bidi, cigars, hookah, chillum) cessation is the key in the primary prevention of COPD. Support for smoking cessation should be seen as a key element in multidisciplinary working agreements for the management of COPD.
- Strategies for smoking cessation support may include pharmacotherapy and nicotine replacement therapy (NRTs) to increase and sustain long-term smoking abstinence rates. Legislative smoking bans, education and counselling, delivered by healthcare professionals, are recommended to improve quit rates.
- Nicotine replacement products such as nicotine gums, inhaler, nasal spray, lozenges, sublingual tablets are recommended to help increase long term smoking abstinence rates.
- Direct and indirect exposure to tobacco smoke should be avoided. Other risk factors that should be addressed include low birth weight, poor nutrition, acute respiratory infections of early childhood, indoor and outdoor air pollutants, and occupational risk factors.
- Avoidance of occupational and environmental pollution, including passive tobacco smoke exposure is recommended, particularly in vulnerable persons such as pregnant women and persons with alpha-1 protease inhibitor deficiency.
- Exposures to hazards (chemicals, dust, fumes) that cause or alter unhealthy behaviours that can lead to COPD should be avoided.
- People should be educated on the risks of smoking and exposure to indoor air pollutants.
- If possible, people should be advised to cook (using wood or carbon) outside the house. If not, at least build an oven in the kitchen with a chimney that vents the smoke outside.
- People, especially those at high-risk should be advised to stop working in areas with occupational dust or high air pollution. If this cannot be avoided, employers may need to adopt appropriate workplace dust-mitigation measures and/or provide government approved masks that provide adequate respiratory protection.
- Influenza vaccination is recommended to prevent and/or reduce the incidence of COPD.
- Physical activity (at least for 30 minutes a day) is recommended to help prevent COPD.

4. Conclusion

Asthma and COPD are preventable diseases that could be avoided with appropriate preventive measures in place at PHC level. Foremost is the identification and reduction of risk factors, which are mostly modifiable. Tobacco smoking cessation and avoiding exposure to passive smoke through proper education and counselling are key preventive strategies that could be implemented in low resource settings, including in LMICs.

Appropriate changes in lifestyle including maintaining healthy lifestyle are possible and may prove to be beneficial in prevention of asthma and COPD. Primary health care level interventions should aim at early identification of risk factors, smoking cessation strategies, advice on avoiding indoor and outdoor pollutants, promotion of physical activity, and healthy diet and nutrition to improve quality of life and other relevant patient outcomes. Allergic sensitisation is identified as one of the common precursors for development of asthma; and therefore, it is recommended that primary prevention should be initiated early focussing on perinatal interventions. Indoor cooking with biomass fuels is an important risk factor for COPD in many LMICs, and therefore, community awareness and multi-sectoral co-ordination to prevent this indoor air pollution may be effective in the prevention of COPD.

Primary care health care professionals are the first point of contact for preventing and managing CRDs in many countries particularly in resource-limited countries, where access to pulmonary specialists is limited. Primary healthcare professionals trained and educated in preventing asthma and COPD are therefore essential to address these major public health problems. Targeted policies in LMICs may provide cost-effective strategies, including primary preventive programs against tobacco smoke and the use of solid fuels.

5. Recommendations for future research

- None of the included guidelines provided best practice recommendations on the cost-effectiveness of some of the preventive strategies recommended, from a LMIC perspective. Guidelines in future may consider a separate section on cost-effectiveness of preventive measures, particularly in a LMIC context.

6. Strengths and limitations of the review

- In terms of its strength, this rapid review is based on a comprehensive search strategy. In addition, guidelines from additional unpublished sources were also searched for.
- An assessment of the quality of included guidelines using a standardised checklist would have been beneficial to understand the quality of reporting of the included guidelines, which is a limitation of this report.

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8. Appendix

Appendix 1: Search Strategies

Asthma

PubMed

No.	Search terms	No. of hits
#1	Asthma[MeSH] OR asthma[tw] OR asthma[tw]	172737
#2	prevention[tw] OR preventive[tw] OR "direct exposure to tobacco smoke"[tw] OR "indirect exposure to tobacco smoke"[tw] OR nutrition[MeSH] OR nutrition[tw] OR "dietary intake"[tw] OR "dietary supplements"[MeSH] OR "dietary supplements"[tw] OR nutraceutical[tw] OR nutraceuticals[tw] OR "food supplements"[tw] OR breast feeding[MeSH] OR "breast feeding"[tw] OR breastfeeding[tw] OR "environmental control"[tw] OR "environmental exposure"[MeSH] OR "environmental exposure"[tw] OR "environmental exposures"[tw]	2276111
#3	"practice guidelines as topic"[MeSH] OR guideline*[tw] OR "best practice*"[tw]	462663
#4	#1 AND #2 AND #3 Filters: English; Humans; Published in the last 10 years	542

EMBASE

No.	Search terms	No. of hits
#1	Asthma/de OR asthma OR asthmas	321498
#2	prevention/de OR prevention OR preventive OR "direct exposure to tobacco smoke" OR "indirect exposure to tobacco smoke" OR nutrition/de OR nutrition OR "dietary intake" OR "dietary supplement"/de OR "dietary supplement" OR "dietary supplements" OR nutraceutical OR nutraceuticals OR "food supplements" OR breastfeeding OR "breast feeding" OR "environmental control" OR "environmental exposure"/de OR "environmental exposure" OR "environmental exposures"	3168170
#3	"guideline*" OR "best practice*"	765538
#4	#1 AND #2 AND #3 AND [embase]/lim NOT [medline]/lim AND [humans]/lim AND [2010-2020]/py AND [english]/lim	709

Additional search from other unpublished/grey literature sources

Search terms used and number of relevant guidelines retrieved from other grey literature sources

No.	Search terms	Number
#1	(prevention) AND (guidelines OR recommendations)	2

COPD

PubMed

No.	Search terms	No. of hits
#1	Pulmonary Disease, Chronic Obstructive[MeSH] OR "chronic obstructive pulmonary disease"[tw] OR "chronic obstructive airway disease"[tw] OR "COPD"[tw] OR "COAD"[tw] OR "chronic obstructive lung disease"[tw] OR "chronic airflow obstruction"[tw] OR "chronic airway obstruction"[tw] OR "chronic obstructive bronchitis"[tw] OR "chronic obstructive bronchopulmonary disease"[tw] OR "chronic obstructive lung disorder"[tw] OR "chronic obstructive pulmonary disorder"[tw] OR "chronic obstructive respiratory disease"[tw]	85746
#2	prevention[tw] OR preventive[tw] OR "direct exposure to tobacco smoke"[tw] OR "indirect exposure to tobacco smoke"[tw] OR "smoking cessation"[MeSH] OR "smoking cessation"[tw] OR "quitting smoking"[tw] OR "abstinence from smoking"[tw] OR "abstinence from nicotine"[tw] OR "abstinence from smoking"[tw] OR "abstinence from tobacco"[tw] OR "smoking dehabituatio[n]"[tw] OR "stop smoking"[tw] OR "stopping smoking"[tw] OR "tobacco use cessation"[tw] OR "life style"[MeSH] OR "life style"[tw] OR lifestyle[tw] "influenza vaccination"[tw] OR "prophylactic antibiotics"[tw] OR "physical activity"[tw] OR exercise[MeSH] OR exercise[tw] OR education[MeSH] OR education[tw] OR "peer group"[tw] OR "peer support"[tw] OR "environmental exposure"[MeSH] OR "environmental exposure"[tw] OR "environmental exposures"[tw]	1858693
#3	"practice guidelines as topic"[MeSH] OR guideline*[tw] OR "best practice"[tw]	462663
#4	#1 AND #2 AND #3 Filters: English; Humans; Published in the last 10 years	440

EMBASE

No.	Search terms	No. of hits
#1	"chronic obstructive lung disease"/de OR "chronic obstructive lung disease" OR "chronic obstructive pulmonary disease" OR "chronic obstructive airway disease" OR "COPD" OR "COAD" OR "chronic airflow obstruction*" OR "chronic airway obstruction" OR "chronic obstructive bronchitis" OR "chronic obstructive bronchopulmonary disease" OR "chronic obstructive lung disorder" OR "chronic obstructive pulmonary disorder" OR "chronic obstructive respiratory disease"	158041
#2	prevention/de OR prevention OR preventive OR "direct exposure to tobacco smoke" OR "indirect exposure to tobacco smoke" OR "smoking cessation"/de OR "smoking cessation" OR "quitting smoking" OR "abstinence from smoking" OR "abstinence from nicotine" OR "abstinence from smoking" OR "abstinence from tobacco" OR "smoking dehabituatation" OR "stop smoking" OR "stopping smoking" OR "tobacco use cessation" OR lifestyle/de OR "life style" OR lifestyle OR "influenza vaccination" OR "prophylactic antibiotics" OR "physical activity"/de OR "physical activity" OR exercise/de OR exercise OR education/de OR education OR "peer group"/de OR "peer group" OR "peer support" OR "environmental exposure"/de OR "environmental exposure" OR "environmental exposures"	4573805
#3	"guideline*" OR "best practice*"	765538
#4	#1 AND #2 AND #3 AND [embase]/lim NOT [medline]/lim AND [humans]/lim AND [2010-2020]/py AND [english]/lim	1148

Additional search from other unpublished/grey literature sources

Search terms used and number of relevant guidelines retrieved from other grey literature sources

No.	Search terms	Number
#1	(prevention) AND (guidelines OR recommendations)	2