World Health Organization
South-East Asia Region

Chronic respiratory diseases

in WHO South-East Asia

Burden, risk factors and services for prevention and management

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Chronic respiratory diseases in WHO South-East Asia: Burden, risk factors and services for prevention and management

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Facts and data pertaining to the Republic of Indonesia are included in this report as the Member State was affiliated to the World Health Organization's South-East Asia Region at the time the report was commissioned and prepared. It is to be noted here that Indonesia was reassigned to the WHO Western Pacific Region with effect from June 2025 following a resolution to that effect adopted by the Seventy-eighth World Health Assembly in Geneva in May 2025.

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Foreword

Chronic respiratory diseases (CRDs)—primarily asthma and chronic obstructive pulmonary disease (COPD)—contribute significantly to the burden of noncommunicable diseases (NCDs) in the WHO South-East Asia Region. CRDs impose a growing socioeconomic burden on individuals, families, and health systems, particularly in underserved and marginalized populations. These groups face widespread risk factors such as tobacco use, air pollution, and occupational exposures, and limited access to early diagnosis and essential care.

This report presents a comprehensive overview of the current status of the burden of CRDs and national responses in the region. It highlights the epidemiological trends, reviews the existing national policies and health system responses, and identifies critical gaps in prevention, diagnosis, treatment, and long-term care.

The findings presented highlight the need to sustain the progress made for reducing risk factors. They also illustrate the importance of prioritizing and accelerating the implementation of cost-effective interventions through a multisectoral approach, and strengthening primary health care systems for CRD services under the broader NCD prevention and control agenda. Addressing CRDs effectively requires not only improved access to affordable diagnostics and essential medicines, but also stronger implementation of tobacco control laws, cleaner air policies, and increased public awareness.

This review is intended to support governments, public health experts, and partners in making informed decisions, prioritizing interventions, and advancing universal health coverage for CRDs. It is also a call to action to build resilient health systems capable of meeting the complex and growing challenge of CRDs. It is our hope that the report will be an impetus for advocacy, and for the necessary allocation of resources to address this challenge across South-East Asia.

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Abbreviations and acronyms

ASEAN	Association of Southeast Asian Nations
AQG	air quality guidelines
BAR-HAP	Benefits of Action to Reduce Household Air Pollution
BMI	body mass index
CCS	Country Capacity Survey
CHEST	Clean Household Energy Solutions Toolkit
CI	confidence interval
CLRTAP	Convention on Long-range Transboundary Air Pollution
COPD	chronic obstructive pulmonary disease
CRD	chronic respiratory disease
DALY	disability-adjusted life year
ENDS	electronic nicotine delivery systems
FCTC	Framework Convention on Tobacco Control
GAPPD	Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea
GARD	Global Alliance against Chronic Respiratory Diseases
GBD	Global Burden of Disease
GINA	Global Initiative for Asthma
GOLD	Global Initiative for Chronic Obstructive Lung Disease
GDP	gross domestic product
GYTS	Global Youth Tobacco Survey
HIMS	Health Information Management System
ICD	International Classification of Diseases
ILO	International Labour Organization
INT$	international dollars
IT	interim target
JKN	Jaminan Kesehatan Nasional
LPG	liquefied petroleum gas
MSBY	Mukhyamantri Swasthya Bima Yojna
NCD	noncommunicable disease
NEML	National Essential Medicine List
NPCDCS	National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke

NRT	nicotine replacement therapy
OOP	out-of-pocket
PCV	pneumococcal conjugate vaccine
PEFR	peak expiratory flow rate
PEN	package of essential noncommunicable disease interventions
PM	particulate matter
PMUY	Pradhan Mantri Ujjwala Yojana
PTLD	post-tuberculosis lung disease
RSBY	Rashtriya Swasthya Bima Yojna
SDG	Sustainable Development Goal
SE	South-East
SHS	second-hand smoke
TB	tuberculosis
WHO	World Health Organization
WHO HQ	WHO headquarters
WHO-SEARO	WHO Regional Office for South-East Asia

Executive summary

Chronic respiratory diseases (CRDs) represent a growing public health concern in the WHO South-East (SE) Asia Region, accounting for approximately 12% of all deaths. The two primary conditions – chronic obstructive pulmonary disease (COPD) and asthma – contribute significantly to disability, premature mortality and economic burden across the Region. In 2021, CRDs caused approximately 1.56 million deaths in the Region, with COPD accounting for nearly 1.24 million and asthma for 254 834 deaths. Alarmingly, 37% of these deaths occurred before the age of 70 years.

Surveys on the burden of morbidity of CRDs across WHO SE Asia Region countries with comparable methodologies and timelines are scarce. Global Burden of Disease (GBD) 2021 estimates the average prevalence of CRDs for the SE Asia Region at 4.73% (95% CI: 4.38%–5.16%), affecting over 104 million individuals. COPD affects 50.12 million people and asthma 46.64 million. According to the estimates, the incidence of asthma in the Region is highest in the age group of 5–9 years (0.15%).

The economic toll of CRDs is substantial. Between 2020 and 2050, based on the adjusted purchasing power parity (PPP), the Region is projected to incur economic costs amounting to INT$ 584 billion due to COPD. High out-of-pocket expenditures further strain individuals and families, especially in low-income settings.

The primary risk factors for CRDs fall into environmental, behavioural and metabolic categories. Air pollution is the most important risk factor for COPD; it remains a major concern with annual average particulate matter 2.5 ($PM_{2.5}$) concentrations in countries such as Bangladesh, India and Nepal, nearly ninefold above WHO thresholds. Household use of polluting fuels such as biomass and coal remains widespread, particularly in the Democratic People's Republic of Korea (DPR Korea) (89%), Bangladesh (75%) and Myanmar (69%), contributing to indoor air pollution and disproportionately affecting women and children.

Tobacco use remains highly prevalent as well, especially among men (24%), with Indonesia reporting the highest smoking rates (37%). Exposure to second-hand smoke (SHS) is also widespread, with around 65% of adolescents in several countries affected. Occupational exposure to dust and fumes, especially in informal sectors such as mining, construction and agriculture, also poses a significant risk.

Though the WHO package of essential noncommunicable (PEN) disease interventions – which provides an integrated approach to strengthening noncommunicable disease (NCD) care services, including CRDs, in primary health care – is widely implemented in the WHO SE Asia Region, significant service delivery gaps remain in the early detection and long-term treatment of asthma and COPD. Seven countries reported the unavailability of diagnostic tools, such as spirometry and peak flow meters, at the primary health care level. The combination budesonide-formoterol inhaler was reported to be available in primary care settings in only three countries in the Region. Routine health reporting systems lack key facility-based indicators for CRDs, which are essential for guiding national programmes.

Comorbidities of CRDs are an added challenge in the Region – primarily the existence of COPD with previously treated tuberculosis that contributes to worsening of clinical outcomes. The Region has more than 45% of the global burden of annual tuberculosis incidence; this indicates that it is essential to manage this comorbidity.

The proven cost-effectiveness of the interventions for CRD prevention and control is highlighted in the updated Appendix 3 of the Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2030. Strong political commitment and a multisectoral approach are needed to implement regulatory, legislative and fiscal measures aimed at reducing risk factors contributing to CRDs. To prevent CRDs, it is crucial to ensure the full implementation of the WHO Framework Convention on Tobacco Control (WHO FCTC) measures, alignment of national standards for annual ambient $PM_{2.5}$ concentrations with WHO air quality guidelines, strengthening of air quality monitoring, enforcement of Clean Household Energy Solutions Toolkit (CHEST) measures and maintenance of occupational health standards.

A health systems approach is essential to better manage CRDs, including the use of evidence-based management protocols, inclusion of essential medicines, particularly of combination inhalers, in the National Essential Medicine List and ensuring the availability of inhalers at the primary health care level. The essential package of CRD diagnosis, treatment and care needs to be integrated into universal health coverage (UHC) benefit packages. Investing in the surveillance of the CRD burden and programme outcomes, using existing health management information systems, is crucial for monitoring the trends of the burden of CRDs and the effectiveness of programmatic interventions. These insights will form the basis for ongoing improvements.

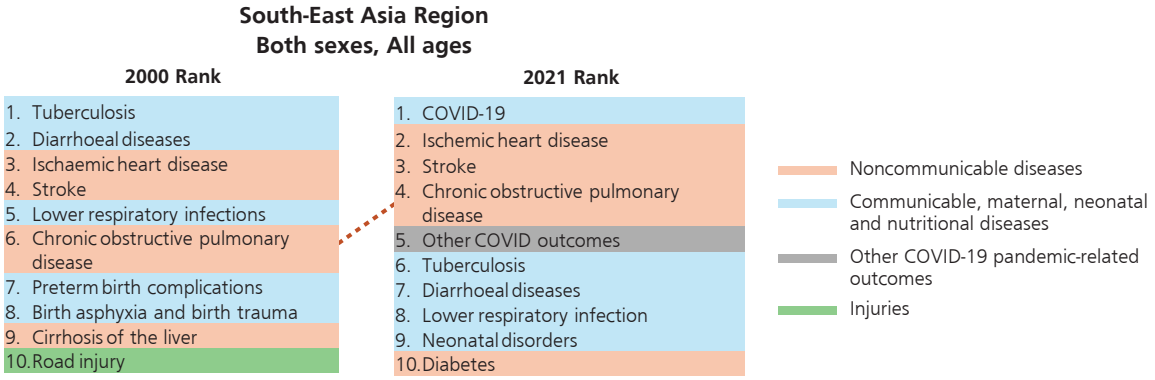
The findings of the report underscore the importance of prioritizing these conditions, particularly in low-resource settings, and the need for sustained and accelerated actions at both the population and health system levels to address the growing burden of CRDs in the Region.

Cleaner Energy and stronger air quality monitoring—key to preventing chronic respiratory diseases at home and work

Background

Chronic respiratory diseases (CRDs) are a group of non-infectious conditions that commonly affect the lungs and airways. The most common among CRDs are chronic obstructive pulmonary disease (COPD), asthma and occupational lung diseases (e.g. silicosis, asbestosis). CRDs are a major cause of morbidity and mortality both globally and in the World Health Organization (WHO) South-East (SE) Asia Region; it is a key public health concern, contributing to millions of deaths and disabilities each year. CRDs account for approximately 12% of all deaths in the Region, with asthma and COPD comprising the majority of the burden *(1)*. According to the Global Burden of Disease 2021 data, COPD has risen to become the fourth leading cause of death in the Region – in 2000, it occupied the seventh place *(2)*. This upward trend reflects both population ageing and sustained exposure to risk factors such as air pollution, tobacco smoke and occupational hazards *(3)*. According to Global Health Estimates 2021, asthma caused approximately 254 909 deaths in the Region.

Fig. 1. Leading causes of death in the South-East Asia Region, 2000 and 2021



Source: Global Health Estimates, 2021

Most CRDs share common risk factors as their etiology and are primarily incurable; however, they may be prevented by reducing or avoiding exposure to certain risk factors *(4)*. Multiple risk factors are known to contribute to the development of CRDs. These include:

- high concentrations of particulate matter in the air;
- exposure to tobacco smoke, either through active smoking or passive exposure to second-hand smoke;
- indoor air pollution from the use of biomass fuels or coal for cooking and heating;
- occupational exposure to dust, fumes or chemicals;
- exposure to various environmental allergens and irritants;
- malnutrition (underweight and overweight or obese); and
- frequent lower respiratory infections during childhood.

Family history of asthma is also a recognized risk factor *(5)*. Additionally, post-tuberculosis (TB) lung damage is an increasingly recognized contributor to obstructive airway disease in high TB-burden countries within the Region *(6)*.

These risk factors underscore the urgent need for integrated, multisectoral interventions aimed at prevention, early detection and long-term disease management.

Purpose of the review

Despite CRDs' substantial contribution to premature mortality and long-term disability, the conditions have historically received limited programmatic attention. The rising burden of CRDs is driven by high levels of exposure to avoidable risk factors such as indoor and ambient air pollution, tobacco smoke, occupational exposures and childhood respiratory infections, coupled with underdiagnosis, late presentation and inadequate integration of CRD care into primary health services.

CRDs are largely incurable but preventable and manageable with cost-effective interventions. Recognizing this, WHO has developed technical packages and frameworks, such as MPOWER (for tobacco control) [M- Monitoring tobacco use; P- Protecting people from tobacco smoke; O- Offering help to quit tobacco use; W- Warning about the danger of tobacco; E- Enforcing tobacco advertising, promotion and sponsorship bans; R- Raising taxes on tobacco] and Clean Household Energy Solutions Toolkit (CHEST), offering normative guidance to reduce key risk factors.

In terms of existing WHO technical guidance for prevention and management of CRDs, the Implementation Roadmap for the Global Action Plan for the Prevention and Control of NCDs (2013–2030) provides an updated menu of policy options and cost-effective recommendations to reduce risk factors and improve the management of NCDs, including CRDs *(7)*. The WHO package of essential noncommunicable (PEN) disease interventions for primary health care provides an integrated approach to strengthen NCD care services, including CRDs, in primary health care.

While countries in the WHO SE Asia Region are undertaking various measures to address the burden of CRDs, these diseases continue to pose a significant challenge to socioeconomic development and threaten the achievement of Sustainable Development Goal (SDG) 3.4 which aims to reduce premature deaths from NCDs by one-third by 2030. This highlights the urgent need to identify existing gaps, challenges and opportunities in CRD prevention and care, and develop an action framework to address prevention and control of CRDs.

In this context, the report aims to provide a comprehensive overview of the burden of CRDs and the status of related prevention and management services in the SE Asia Region. Highlighting the specific challenges faced by the countries in the Region, the report will serve as the basis for the identification of relevant and actionable solutions to strengthen CRD prevention, early detection, treatment and long-term management in the Region.

Overview of the common CRDs and the major global health initiatives

What is asthma?

Affecting both children and adults, asthma is the most common chronic disease among children. Inflammation and narrowing of the small airways in the lungs cause asthma symptoms, which can be any combination of cough, wheeze, shortness of breath and chest tightness *(5)*. These symptoms can fluctuate and recur over time; they may be mild or severe, depending on the person and the situation.

The condition results from chronic immune-mediated inflammation of the airways in the lungs, which increases their sensitivity and makes the airways more prone to irritation and constriction. During an asthma attack, the muscles surrounding the airways tighten, causing narrowing of the bronchial

tubes. Additionally, the lining of the air passages swells and excess mucus is secreted, further restricting airflow in and out of the lungs (Fig. 2).

The inflammation in asthma is typically chronic and is not caused by infection, although infections may act as triggers. Instead, it represents an overreaction of the airways – a state of hyper-responsiveness – to various inhaled substances and fine particles. Common triggers include tobacco smoke, viruses, allergens and irritant gases, reflecting the heterogeneous nature of the disease.

Asthma development reflects a complex interplay between genetic susceptibility and environmental exposures, particularly during early life. Children of asthmatic parents have a higher likelihood of developing the condition, but environmental triggers such as biomass smoke, indoor pollution and urban air quality play a critical role in disease onset and progression.

Fig. 2. The effects of asthma on the airways

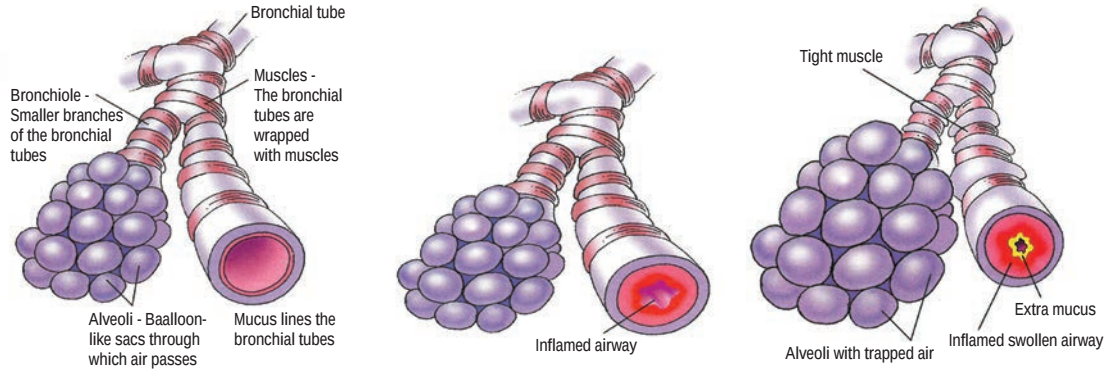


Image courtesy – Asthma workbook, University of Michigan

Despite its treatability, asthma remains underdiagnosed and often poorly managed in low-resource settings. The WHO revised package of essential noncommunicable (PEN) disease interventions 2020 provides a structured approach to diagnosing asthma, particularly in low-resource settings, which includes symptom assessment, use of peak expiratory flow rate (PEFR) measurement, bronchodilator response assessment to determine if a diagnosis of asthma is likely and structured follow-up *(8)*. The WHO International Classification of Diseases 11 (ICD-11) code for asthma is CA23 *(9)*.

What is chronic obstructive pulmonary disease?

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) defines chronic obstructive pulmonary disease (COPD) as a heterogenous lung condition characterized by chronic respiratory symptoms (dyspnoea, cough, sputum production and/or exacerbation) due to abnormalities of the airways (bronchitis, bronchiolitis) and/or alveoli (emphysema) that cause persistent, often progressive, airflow obstruction *(10)*.

The pathophysiological changes that lead to airflow limitation in COPD include chronic inflammation and structural alterations in the airways and lung parenchyma, and impaired mucociliary clearance. These changes lead to key clinical features:

- The body produces more mucus than usual.
- The lungs become less effective at clearing out mucus and germs.
- The small airways become narrower, making it harder for air to flow.

- Damage to the tiny air sacs in the lungs reduces their ability to take in oxygen and get rid of carbon dioxide.
- The alveoli that help keep the small airways open get damaged or destroyed; therefore, the airways collapse more easily when breathing out, making it harder to push air out of the lungs.
- Airway elasticity gets reduced.
- Gas exchange impairment occurs.

The relative contribution of each of these mechanisms varies from patient to patient, creating diverse clinical presentations.

Chronic bronchitis and emphysema are two commonly described and clinically overlapping forms of COPD.

The diagnosis of COPD should be suspected in any individual presenting with chronic cough, sputum production or breathlessness and/or has a history of frequent respiratory infections ("colds") or exposure to known risk factors. COPD is often underdiagnosed and can be a life-threatening lung disease.

Poorly reversible airflow limitation is the hallmark of COPD. This is best documented using spirometry, which is the most reliable and reproducible test for diagnosing COPD and assessing its severity. Spirometry both confirms the diagnosis and helps categorize the severity of airflow limitation.

The assessment of disease severity in COPD is complex and based on multiple factors, including:

- the severity and frequency of symptoms;
- the frequency and severity of exacerbations; and
- the degree of airflow limitation.

The WHO International Classification of Diseases 11 (ICD-11) code for COPD is CA22 *(9)*.

COPD often coexists with previously treated TB, particularly in low- and middle-income countries (LMICs), where pulmonary TB can lead to long-term lung damage and increase the risk of developing COPD. It is essential to recognize and manage this comorbidity, as it contributes to worse clinical outcomes, higher health-care costs and increased mortality.

What are occupational lung diseases?

Occupational lung diseases or work-related lung diseases are lung conditions caused or made worse by materials when a person is exposed to irritants at the workplace, typically via inhalation of dust, fumes, gases, vapours or biological agents. These exposures may occur over prolonged periods or acutely in high concentrations. The diagnosis of an occupational lung disease has important clinical, occupational and legal implications, including decisions on work continuation, eligibility for compensation and the need for medical surveillance of coworkers *(11)*.

Some of the commonly reported occupational lung diseases are occupational asthma, silicosis, coal worker's pneumoconiosis (black lung disease), asbestos-linked lung disease and hypersensitivity pneumonitis (farmers' lung disease). Other important conditions include byssinosis, chemical-induced bronchitis and occupational forms of COPD.

Prevention and control require a collaborative effort among employers, workers, occupational physicians, pulmonary physicians, industrial hygienists and members from other disciplines.

Major global health initiative to address asthma and COPD

In response to the rising global burden of CRDs, several major initiatives have been developed to guide countries on strengthening prevention, diagnosis and management, especially in low- and middle-income settings.

Two key global clinical frameworks include the Global Initiative for Chronic Obstructive Lung Disease (GOLD) and the Global Initiative for Asthma (GINA). GOLD offers regularly updated, evidence-based strategies for the prevention and management of COPD, with an emphasis on early detection, and individualized care plans based on disease severity and risk profile to improve patient outcomes and quality of life *(10)*. Similarly, GINA, launched in 1993 in collaboration with the National Heart, Lung and Blood Institute and WHO, provides annually updated guidance to reduce asthma-related morbidity and mortality worldwide *(12)*. Both initiatives aim to standardize high-quality care while allowing adaptation to different health system contexts.

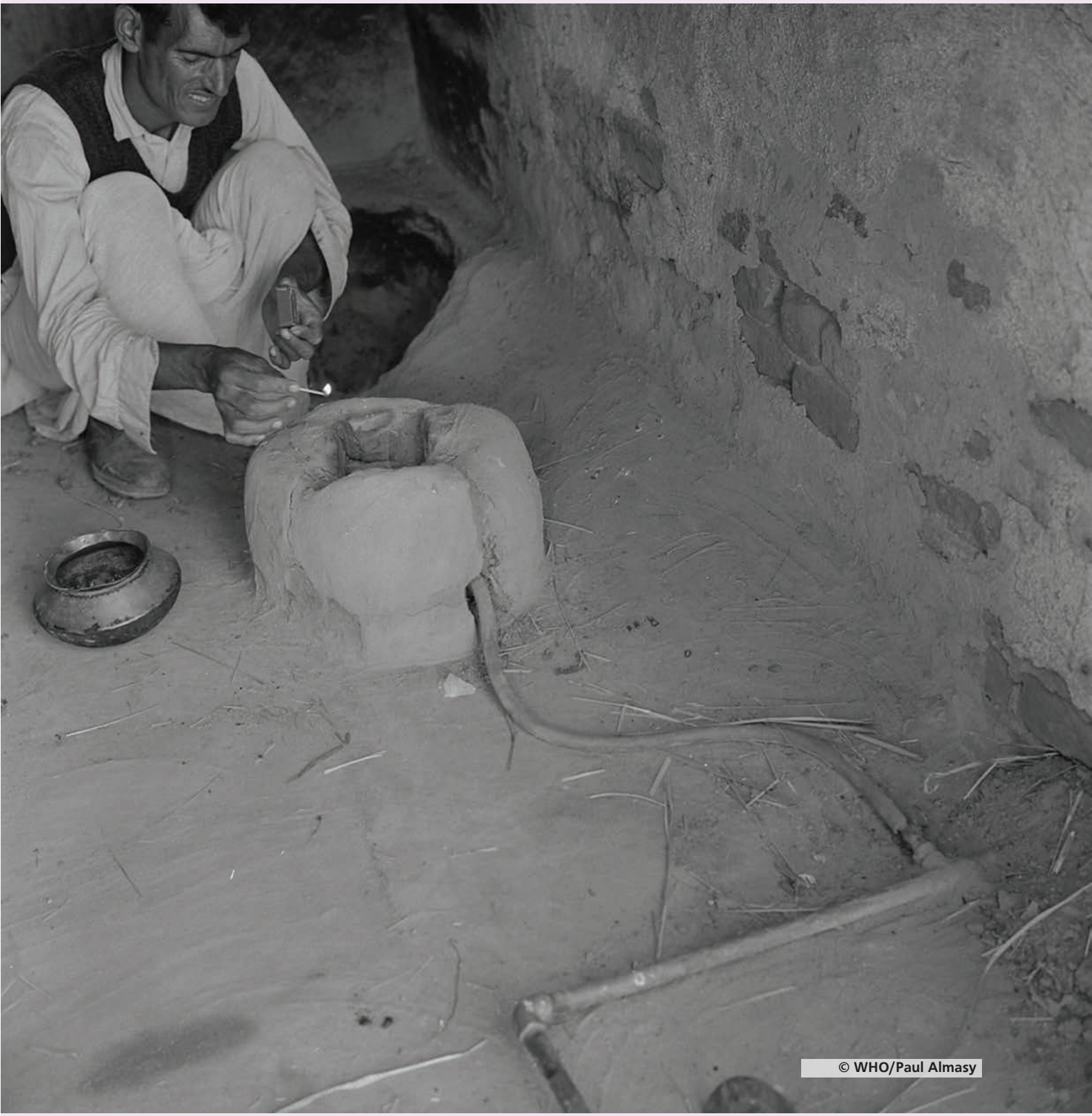
However, the impact of these strategies depends on their translation into primary health care, particularly in settings where access to diagnostic tools, essential inhaled medicines and trained personnel is often limited. To support this transition, WHO PEN 2020 incorporates key components of GOLD and GINA into simplified, resource-sensitive protocols for asthma and COPD management at the first level of care *(8)*.

CRD prevention and control are also prioritized in the WHO Global Action Plan for the Prevention and Control of Noncommunicable Diseases (2013–2030), which calls for a 25% reduction in premature mortality from NCDs and a 30% reduction in tobacco use by 2030 *(13)*. It provides an updated menu of policy options and cost-effective recommendations to reduce risk factors and improve the management of CRDs. Tobacco control remains central to COPD prevention and is governed globally by the WHO Framework Convention on Tobacco Control (FCTC) *(14)*. National implementation of FCTC's MPOWER measures, such as taxation, smoke-free policies and cessation support, can substantially reduce CRD risk across the population.

Given the significant role of air pollution in asthma and COPD, WHO's updated air quality guidelines (AQG) (2021) and the interagency BreatheLife campaign offer technical and advocacy tools to reduce exposure to household and ambient pollutants *(15, 16)*. In particular, WHO's Clean Household Energy Solutions Toolkit (CHEST) provides step-by-step guidance for countries to transition from solid fuels and kerosene to cleaner energy solutions for cooking, heating and lighting, which are interventions directly relevant to women and children *(17)*.

Additionally, WHO has collaborated with the International Labour Organization (ILO) to develop joint global estimates on the occupational burden of disease, identifying key workplace exposures, such as silica, asbestos and diesel exhaust that contribute to COPD, asthma and other lung conditions *(18)*. This evidence supports stronger integration of occupational health within CRD strategies, especially for countries with large informal labour sectors.

Also, WHO continues to support these efforts through collaborative platforms such as the Global Alliance against Respiratory Diseases (GARD), which facilitates coordination among governments, academic institutions and civil society organizations to advance comprehensive CRD responses and policy alignment across sectors *(19)*.



Traditional indoor cooking with solid fuels exposes individuals to harmful smoke, increasing the risk of chronic respiratory diseases such as COPD and asthma

Approach and review methodology

To ensure a comprehensive and accurate review of literature and published data, a scoping review was conducted to identify and extract relevant data. Reliable and authoritative platforms were prioritized for literature searches. Key sources included WHO websites, such as those of the Regional Office for South-East Asia and WHO country offices, as well as government and Ministry of Health (MoH) websites. Some of the common search terms used included combinations of keywords such as "chronic respiratory diseases", "CRD", "COPD", "asthma", "tobacco use", "indoor air pollution", "noncommunicable diseases", "NCDs", "WHO technical packages", "MPOWER", "CHEST toolkit", "health system response" and "South-East Asia Region".

In addition, scientific databases such as Google Scholar and PubMed Central were accessed for retrieving peer-reviewed research and publications.

The materials reviewed and cited in this report include:

- national policies, reports and official government publications;
- WHO reports and surveys (WHO NCD Country Capacity Survey, Global Adult Tobacco Surveys, WHO STEPS Surveys, WHO Global Health Estimates, Evaluation of People-Centred NCD Services, Progress report of WHO governing bodies resolutions); and
- peer-reviewed scientific literature, including research studies and review articles.

Systematic reviews of country-specific surveys were incorporated to provide context-specific estimates, complementing global estimates derived from comparable methodologies.

WHO NCD Country Capacity Survey 2023 was used as the source of data on national response to prevention and management of CRDs *(20).* Government-nominated officials responded to the web-based survey; the responses were validated against the documents of evidence submitted. However, some responses, related to the availability of medicines, devices and services, could not be validated and had limitations, given the unavoidable element of subjectiveness among the respondents.

The report primarily focuses on COPD and asthma, as these two conditions are the leading contributors to deaths and disability from CRDs. Addressing the prevention and management of COPD and asthma is expected to have a broader impact on reducing the overall burden of CRDs. This is because other CRDs share similar risk factors, and the approaches adopted to manage COPD and asthma can also improve the service delivery and care for other respiratory conditions.

Evidence-based action: implementing technical packages and air quality measures to prevent chronic respiratory diseases

Findings of the review

1. Burden of chronic respiratory diseases in the WHO South-East Asia Region

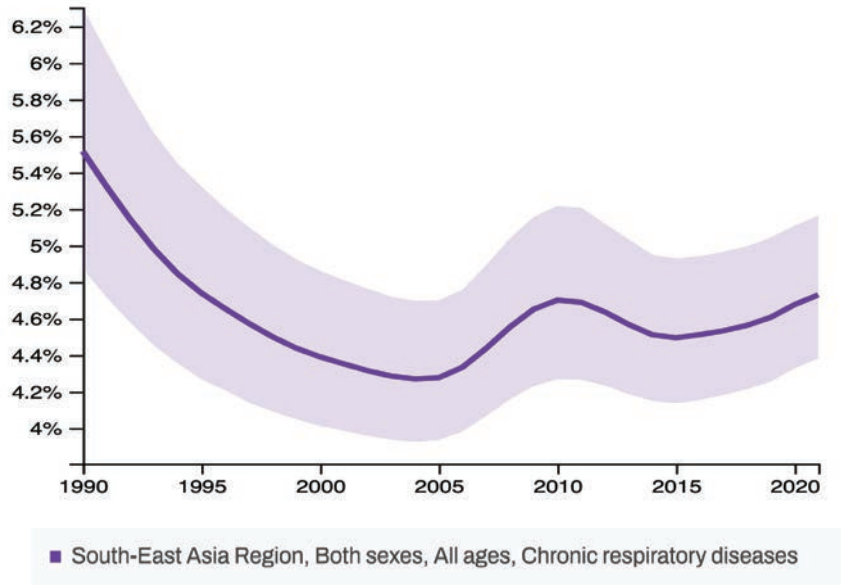
The WHO SE Asia Region accounts for nearly one third of the global burden of CRD-related mortality, with COPD ranking among the top five causes of death in several countries.

In the following section, the burden of CRDs is presented as the burden of diseases described in terms of prevalence, incidence, morbidity, mortality, disability-adjusted life years (DALYs) and economic burden. WHO updated disease-specific mortality estimates in 2021. The literature review identified a lack of country-specific studies using comparable methodologies for morbidity estimation; consequently, the Global Burden of Disease (GBD) 2021 data had been utilized to ensure consistency and comparability.

1.1 Prevalence of chronic respiratory diseases

According to GBD 2021, the prevalence of CRDs in the Region, which include COPD, asthma, interstitial lung disease and pulmonary sarcoidosis, pneumoconiosis and other less common respiratory conditions, was estimated at 4.73% (95% CI: 4.38%–5.16%) in 2021 for both sexes combined. The prevalence among women (4.79%) and that among men (4.67%) were more or less similar. The total number of CRD cases in the Region was estimated at approximately 104.15 million *(2).* The prevalence of CRDs in the Region demonstrated a declining trend from 1990 through the early 2000s; however, the data suggest a gradual resurgence in prevalence, beginning around 2015 and continuing through 2020 (Fig. 3).

Fig. 3. Prevalence of chronic respiratory diseases in the South-East Asia Region



Source: GBD results 2021

Based on the estimates of GBD 2021 for countries in the Region, the highest prevalence of CRDs was observed in the Democratic People's Republic of Korea (DPR Korea), which stood at 7.5%, while Bhutan recorded the lowest prevalence at 3.86%. In terms of absolute numbers, India had the highest number of CRD cases (66.76 million), whereas Maldives had the fewest (16 000 cases). Notably, both male and female prevalence rates were highest in DPR Korea (Table 1).

Table 1. Prevalence of CRDs in the WHO South-East Asia Region, 2021

Country	Male		Female		Total	
	Number	%	Numbers	%	Numbers	%
Bangladesh	3 147 000	4.06	3 706 000	4.52	6 853 000	4.29
Bhutan	12 000	3.33	16 000	4.42	28 000	3.86
DPR Korea	874 000	7.06	1 024 000	7.93	1 898 000	7.5
India	32 568 000	4.63	34 193 000	5.01	66 761 000	4.81
Indonesia	6 255 000	4.62	5 048 000	3.75	11 303 000	4.19
Maldives	9 000	3.02	7 000	3.66	16 000	3.27
Myanmar	1 164 000	4.43	1 096 000	3.82	2 260 000	4.11
Nepal	542 000	3.84	646 000	4.05	1 188 000	3.95
Sri Lanka	636 000	6.19	627 000	5.58	1 263 000	5.87
Thailand	2 044 000	6.57	1 658 000	4.9	3 702 000	5.7
Timor-Leste	33 000	4.77	29 000	4.26	62 000	4.52
Region	47 284 000		48 050 000		95 334 000	

Disaggregation of the CRD data of GBD 2021 showed that the prevalence of asthma in the Region was estimated at 2.31% (95% CI: 2.03%–2.64%) for both sexes combined. Unlike CRDs overall, asthma prevalence was higher among men (2.43%) than among women (2.2%). The total number of asthma cases was estimated at 46.64 million. The distribution pattern of asthma prevalence closely mirrored that of overall CRDs, with DPR Korea recording the highest rate (4.23%) and Bhutan the lowest (1.56%) (Table 2). COPD cases were estimated at 50.12 million in the Region, slightly surpassing the number of asthma cases. The prevalence of COPD stood at 2.49% (95% CI: 2.25%–2.72%), with a higher rate in women (2.67%), compared with that in men (2.31%). In contrast to asthma, the lowest prevalence of COPD was observed in Timor-Leste (1.45%) while DPR Korea recorded the highest prevalence at 3.48% yet again.

Table 2. Prevalence of COPD, asthma among both sexes in the WHO South-East Asia Region, 2021

Country	COPD		Asthma	
	Number	%	Number	%
Bangladesh	4 020 100	2.52	2 869 000	1.8
Bhutan	16 900	2.32	11 300	1.56
DPR Korea	879 500	3.48	1 068 900	4.23
India	35 819 800	2.58	32 054 600	2.31
Indonesia	5 080 700	1.88	6 333 400	2.35
Maldives	8 200	1.65	7 800	1.56
Myanmar	1 295 500	2.36	983 000	1.79

Country	COPD		Asthma	
	Number	%	Number	%
Nepal	710 500	2.36	485 100	1.61
Sri Lanka	495 500	2.3	808 000	3.75
Thailand	1 781 000	2.74	1 977 600	3.04
Timor-Leste	19 700	1.45	42 100	3.11
Region	50 127 400	2.49	46 640 800	2.31

In terms of incidence, there were an estimated 11.54 million new CRD cases in 2021, with an overall incidence rate of 559.6 per 100 000 population. Asthma accounted for 7.17 million new cases (347.5 per 100 000) while COPD contributed 4.26 million new cases (incidence rate of 206.9 per 100 000). India reported the highest number of new CRD cases (8.09 million), largely due to its large population base (Table 3) *(2)*.

Table 3. Incidence of CRDs in the WHO South-East Asia Region, 2021

Country	CRD incidence	
	Number of new cases	Rate per 100 000 (crude)
Bangladesh	823 200	500.05
Bhutan	3 400	456.58
DPR Korea	210 900	799.29
India	8 085 600	571.62
Indonesia	1 421 200	509.57
Maldives	1 900	385.39
Myanmar	291 400	516.49
Nepal	157 200	505.08
Sri Lanka	155 400	698.1
Thailand	389 000	583.36
Timor-Leste	9 400	676
Region	11 548 600	559.65

The highest incidence of asthma is observed among children aged 5–9 years (0.15%) and those under five years (0.14%). The incidence rate shows a decline in older age groups. A slight increase is noted in the 55+ years age group, where the incidence rate is 0.09% (Table 4).

Table 4. Age-specific incidence of asthma among both sexes in the WHO South-East Asia Region, 2021

Age group (in years)	Incidence per 100 000
<5	140
5–9	150
10–19	50
20–54	40
55+	90

While the report primarily draws on GBD 2021 estimates due to the strength in enabling cross-country comparability, it is important to acknowledge the limitations in reflecting the true national burden of CRDs. For example, while GBD estimates COPD prevalence in Nepal at 3.95%, national sources such as pooled studies and surveys report much higher figures, up to 22.7% and around 12%, respectively *(21, 22)*. In Bangladesh, pooled national data suggest a COPD prevalence of 12.5%, significantly higher than GBD estimates *(23)*. Similarly, the prevalence of asthma in Bangladesh has been reported at 4.2% among the adult rural population *(24)*. In India, GBD data estimate COPD prevalence at approximately 2.6% while pooled national estimates indicate a prevalence of 7.4% *(25)*. Such discrepancies highlight the risk of underestimating the actual disease burden when relying solely on GBD data. This underreporting contributes to CRDs receiving less attention in terms of funding, research and programmatic actions, and must be explicitly recognized when interpreting findings and setting priorities *(26)*.

1.2 Mortality due to chronic respiratory diseases

The mortality due to CRDs is presented in terms of total deaths, age-standardized mortality rate and CRDs as a proportion of all NCD deaths based on the data from WHO Global Health Estimates.

Based on WHO Global Health Estimates 2021, an estimated 1.56 million deaths were caused by CRDs globally, with a higher number reported among women (815 959), compared with men (750 896) (Table 5). It is estimated that around 37% of all CRD deaths occur below the age of 70 years, accounting for approximately 0.58 million deaths globally *(27)*.

Among CRDs, COPD emerged as the leading cause of death, accounting for approximately 1.24 million deaths – 621 278 among women and 617 162 among men. Asthma was responsible for 254 834 deaths, with significantly higher mortality among women (155 525) than among men (99 383).

In 2021, India recorded the highest number of deaths attributed to CRDs, totalling 1.25 million, of which 672 349 were among women and 587 407 among men. In contrast, Maldives reported the lowest CRD mortality, with only 268 deaths (143 men, 125 women). Notably, female mortality surpassed male mortality in several countries, including Bhutan, DPR Korea, India and Nepal. This pattern is unusual, as globally, COPD mortality tends to be higher among men. The higher female mortality in these countries likely reflects high exposure to household air pollution, particularly from use of solid fuels for cooking in poorly ventilated homes.

COPD-related mortality was generally higher among men, except in Bhutan, DPR Korea, India and Nepal, where female mortality surpassed male mortality. The highest female-to-male mortality ratio for COPD was observed in Nepal (1.23), followed by DPR Korea (1.14).

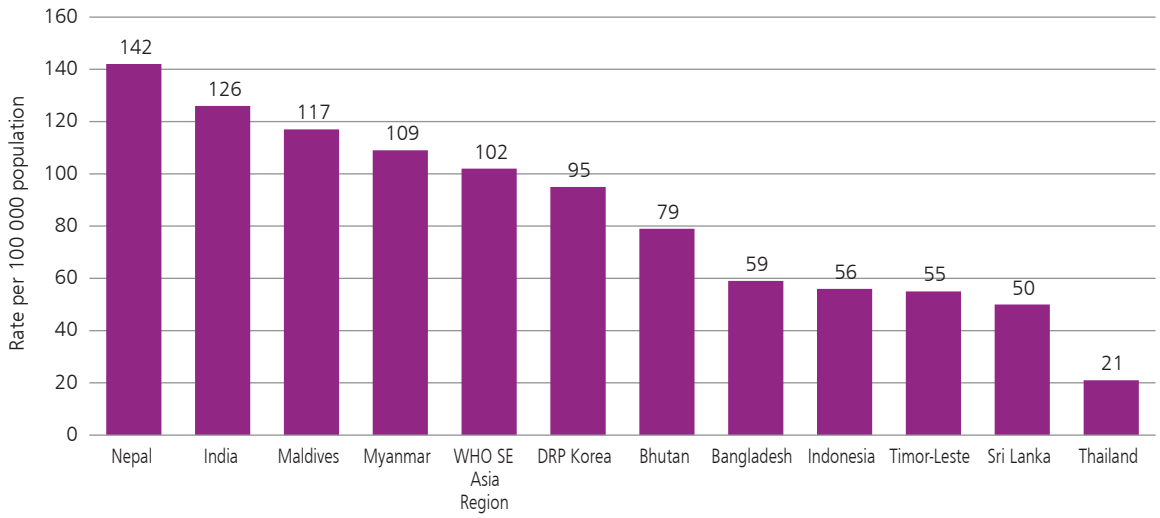
A notable exception to the general gender trends was observed in asthma-related mortality, which was higher among women across all countries in the Region, except in Maldives and Thailand. This pattern warrants careful interpretation as it may reflect gender-based disparities in health care access, with potential factors including undertreatment, delayed health care seeking and difference in symptom reporting among women. The female-to-male mortality ratio for asthma was highest in Nepal (1.83), followed by India (1.67) and Bhutan (1.63).

Table 5. Deaths due to chronic respiratory diseases, COPD and asthma in the Region, 2021

Country	CRD		COPD		Asthma		Other respiratory diseases	
	Male	Female	Male	Female	Male	Female	Male	Female
Bangladesh	34 359	30 443	28 176	23 055	4 144	5 633	2 039	1 755
Bhutan	215	234	183	188	22	35	10	10
DPR Korea	15 076	17 206	14 243	16 275	602	804	230	127
India	587 407	672 349	482 793	513 568	74 872	124 805	29 742	33 980
Indonesia	60 041	46 712	47 921	31 491	11 271	13 752	850	1 468
Maldives	143	125	116	105	15	11	13	9
Myanmar	20 467	18 697	16 421	13 415	3 752	4 767	290	515
Nepal	11 557	15 648	9 487	12 199	1 483	2 711	590	738
Sri Lanka	6 533	5 961	5 357	4 649	886	997	290	314
Thailand	14 851	8 386	12 277	6 201	2 283	1 951	292	234
Timor-Leste	247	198	188	132	53	59	5	6
Region	750 896	815 959	617 162	621 278	99 383	155 525	34 351	39 156

The age-standardized death rate in the Region varies across countries. Fig. 4 depicts the age-standardized death rate in Member States in 2019, indicating that it is highest in Nepal (146 per 100 000) and lowest in Thailand (21 per 100 000).

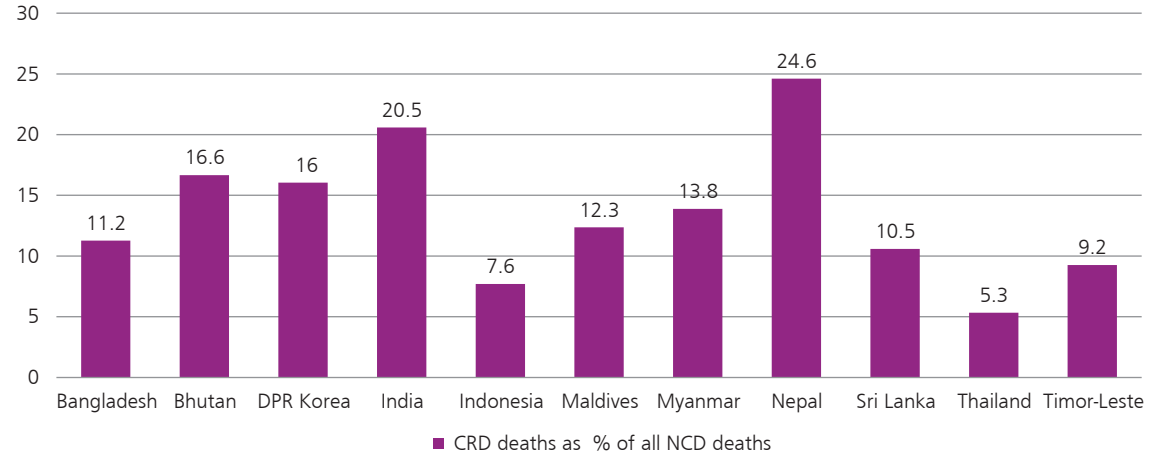
Fig. 4. Age-standardized (country-wise) death rate in the South-East Asia Region, 2019



Source: Global Burden of Disease, 2019

The proportionate mortality from CRDs also varies across the countries. CRDs contribute to 24.6% of all NCD deaths in Nepal, which is the highest, and account for 5.3% of all NCD deaths in Thailand, which is the lowest (Fig. 5).

Fig. 5. Contribution of CRDs to the total number of NCD deaths in South-East Asia Region countries, 2021



Source: Global Health Estimates, 2021

1.3 Disability-adjusted life years (DALYs) due to chronic respiratory diseases

As per the GBD 2021 estimates, the DALYs for both COPD and asthma vary considerably across countries in the WHO SE Asia Region, reflecting differences in disease burden, health care access and underlying risk exposures. DPR Korea has the highest COPD DALY rate (2283.8), indicating a significant burden of disability and premature mortality while Maldives has the lowest (411).

For asthma, Myanmar shows the highest DALY rate (569.1), followed closely by Nepal (471.5) and India (426.9). Maldives again recorded the lowest asthma DALY burden (117.3) (Table 6).

The regional average DALY rate is 1491 for COPD and 404.1 for asthma.

Table 6. DALY rate per 100 000 population by country (both sexes) in the South-East Asia Region, 2021

Country	DALY rate per 100 000 (both sexes), 2021	
	COPD	Asthma
Bangladesh	1 040.9	270.8
Bhutan	1 264.6	262.0
DPR Korea	2 283.8	279.7
India	1 698	426.9
Indonesia	801.6	382.7
Maldives	411.0	117.3
Myanmar	1 524.7	569.1
Nepal	1 961.4	471.5
Sri Lanka	984.5	327.5
Thailand	731.3	247.3
Timor-Leste	605.2	382.2
WHO SE Asia Region	1 491.0	404.1

1.4 Economic burden

Treatment costs for CRDs, encompassing both inpatient and outpatient medical expenses, represent a significant component of the overall economic burden associated with these conditions. A modelling study, which accounted for the disease burden, loss of productivity, absenteeism and diversion of household resources towards out-of-pocket health-care expenditures, estimated the total macroeconomic loss due to COPD in the WHO SE Asia Region to be INT$ 584 billion over the period of 2020–2050, using a 3% discount rate. The use of INT $ computations instead of US$ is to ensure purchasing power parity-adjusted analysis of health costs for more accurate and effective cross-country comparisons. *(28)*.

The country-specific estimates of economic loss, per capita burden and the impact on national gross domestic product (GDP) are summarized in Table 7 below.

Table 7. Estimated economic loss due to COPD (2020–2050)
All figures in 2017 INT$, with uncertainty intervals (UIs)

Country	Total economic loss (billion INT$)	Proportion of GDP (%)	Per capita Loss (INT$)
Bangladesh	28.84 (25.50–42.28)	0.064 (0.056–0.094)	158 (140–232)
Bhutan	0.33 (0.20–0.55)	0.106 (0.065–0.175)	388 (237–643)
DPR Korea	2.33 (1.90–2.88)	0.190 (0.155–0.236)	88 (71–108)
India	417.96 (295.69–557.05)	0.100 (0.071–0.133)	272 (192–362)
Indonesia	96.13 (68.02–130.21)	0.078 (0.055–0.106)	313 (221–424)
Maldives	0.16 (0.12–0.22)	0.059 (0.042–0.081)	300 (215–410)
Myanmar	9.86 (7.83–11.87)	0.112 (0.089–0.135)	166 (132–200)
Nepal	5.56 (3.51–8.25)	0.125 (0.079–0.185)	165 (104–245)
Sri Lanka	7.14 (4.45–11.52)	0.086 (0.054–0.139)	325 (202–524)
Thailand	15.20 (11.28–20.78)	0.043 (0.032–0.059)	220 (163–300)
Timor-Leste	0.10 (0.07–0.14)	0.088 (0.062–0.120)	61 (43–84)

India bears the largest absolute economic burden, with estimated losses of INT$ 417.96 billion, reflecting the combined impact of its large population and high disease prevalence. DPR Korea shows the highest proportional GDP loss at 0.19%, followed by Bhutan (0.10%) and Nepal (0.12%), indicating a substantial economic impact relative to their national economies.

Bhutan, Sri Lanka and Indonesia have some of the highest per capita losses at INT$ 388, INT$ 325 and INT$ 313 respectively.

The lowest per capita impact is observed in Timor-Leste (INT$ 61) and DPR Korea (INT$ 88), despite DPR Korea's high proportional GDP loss, which is likely due to lower overall income levels and population dynamics.

Several studies across the WHO SE Asia Region highlight the substantial direct and indirect costs associated with the treatment of CRDs. However, variations in methodological approaches used to calculate the financial burden make cross-country comparisons challenging.

A hospital-based study in Thailand revealed that the annual average health-care cost for patients with high severe asthma was US$ 658 (± $ 414), compared with US$ 596 (±US$ 879) for those with

mild or moderate severe asthma *(29)*. In India, one study estimated an average annual direct medical expense of ₹ 29 885 (about US$ 436) for COPD treatment, in addition to a direct non-medical cost of INR 7441 (about US$ 109) *(30)*. A household survey conducted in four districts of Sri Lanka estimated that adults with asthma and other NCDs incurred an average out-of-pocket (OOP) expenditure of approximately US$ 9 per clinic visit and US$ 9.3 per hospital admission *(31)*.

In response to these challenges, countries in the Region have begun implementing financial protection strategies, such as increasing government health expenditure, expanding public health services and introducing contributory health insurance schemes aimed at reducing out-of-pocket spending. Despite these initiatives, individuals living with CRDs in the Region often continue to encounter significant financial barriers to accessing timely and adequate care. The WHO's Global Health Expenditure Database and report on health financing underscores the importance of sustained investment and policy reform to reduce OOP costs and ensure equitable access to essential services for chronic diseases such as asthma and COPD.

Burden of CRDs in the WHO South-East Asia Region

- About 12% of all deaths in the Region are due to CRDs.
- At least 104 million people are living with CRDs; cases of COPD (50.12 million) and asthma (46.64 million) are the most common.
- A total of 1.56 million deaths occurred from CRDs in 2021 – 37% were premature (before the age of 70).
- COPD is projected to result in an economic loss of INT$ 584 billion in the Region between 2020 and 2050, driven cumulatively by health-care costs, loss of productivity and out-of-pocket household spending.

2. Leading risk factors contributing to the burden of CRDs

The leading risk factors for CRDs can be broadly categorized into three major groups:

Environmental: This includes exposure to particulate matter in ambient air and household air pollution, particularly from the use of solid fuels for cooking. Ozone exposure also contributes to respiratory diseases.

Occupational exposures, involving silica dust, coal particles, asbestos, metal fumes and agricultural smoke, are common in both formal and informal sectors, and these significantly increase the risk of CRDs among working-age population.

Behavioural: Risk behaviours include tobacco smoking, exposure to second-hand smoke (SHS) and physical inactivity. Emerging threats such as the use of electric nicotine delivery systems (ENDS), commonly referred to as e-cigarettes, and dual use (simultaneous use of tobacco products and e-cigarettes) are increasingly being recognized as significant contributors to respiratory health risks, especially among youths and young adults.

Metabolic: Conditions such as underweight (particularly in children) and obesity are increasingly being recognized as contributors to asthma risk and severity.

In addition to these, early life factors play a foundational role in shaping lifelong lung health. These include poor fetal growth, premature birth, low birth weight, frequent or severe respiratory infections in childhood and exposure to environmental allergens. Additionally, recurrent respiratory infections also exacerbate this burden. A family history of asthma, particularly among first-degree relatives (parents or siblings), and genetic predisposition also increase the likelihood of developing CRDs.

The prevalence of these risk factors varies significantly across countries in the WHO SE Asia Region, contributing to the heterogeneity in the burden of CRDs observed throughout the Region. The following section outlines the burden of key risk factors and their impact on respiratory health across SE Asia Region countries.

2.1 Concentration of particulate matter in air

Airborne particulate matter (PM) ≤2.5 micrometres, also known as $PM_{2.5}$, is an important risk factor for CRDs due to its small size and ability to penetrate deep into the respiratory system. Long-term exposure to $PM_{2.5}$ is linked to the development and worsening of CRDs such as asthma and COPD. It can exacerbate symptoms such as shortness of breath, coughing and wheezing. Additionally, chronic exposure to $PM_{2.5}$ can impair lung function and weaken the immune response, making individuals more susceptible to respiratory infections such as pneumonia, further causing episodes of asthma.

In the WHO SE Asia Region, particulate matter is a leading attributable risk factor for CRDs, particularly COPD. Approximately 800 000 CRD deaths were attributable to particulate matters in 2021 *(2)*.

According to the WHO global air quality guidelines, the recommended annual average concentration for $PM_{2.5}$ exposure should not exceed 5 μg/m³ to safeguard population health *(15)*. Exposure levels beyond this threshold are associated with increased health risks, particularly for CRDs. In the Region, the annual average concentration of $PM_{2.5}$ exceeded the WHO guideline level by a factor of eight, compared with a global average exceedance of 5 *(32)*.

Countries with elevated $PM_{2.5}$ concentrations tend to experience higher rates of CRDs, placing considerable strain on health-care systems. In Bangladesh, India and Nepal, the annual average $PM_{2.5}$ concentration exceeds the WHO threshold nearly ninefold, representing the highest levels of air pollution in the Region *(33)*. This reflects a critical public health concern, with significant implications for lung health and the rising burden of CRDs.

In contrast, Maldives reports the lowest $PM_{2.5}$ levels in the Region, exceeding the WHO guideline limit nearly threefold, suggesting comparatively better air quality and potentially lower pollution-related respiratory risks. Indonesia also reports relatively lower $PM_{2.5}$ levels, about four times the WHO guideline limit, which may be attributed to improved air quality management in certain urban centres.

Other countries, including Bhutan, Myanmar, Sri Lanka, Thailand and Timor-Leste, report annual average $PM_{2.5}$ concentrations exceeding WHO thresholds by a factor of 5–7 (Fig. 6), indicating moderately high air pollution levels and continued risk to respiratory health. This intercountry variation in $PM_{2.5}$ exposure underscores the urgent need to recognize air quality as a major determinant of respiratory health.

2.2 Use of polluting fuels and technologies

Household air pollution resulting from the use of polluting fuels and inefficient technologies – such as biomass (including wood, crop residues and animal dung), coal and kerosene – for cooking and heating constitutes a major risk factor for CRDs. These fuels emit harmful indoor air pollutants, including $PM_{2.5}$, carbon monoxide and other toxic substances that can severely damage the respiratory system. Prolonged exposure to these pollutants is strongly associated with conditions such as COPD, asthma and lower respiratory infections.

Fig. 6. Exceedance of WHO $PM_{2.5}$ guidelines (by a multiple of) in 2020

Source: The Global Health Observatory

This risk disproportionately affects women and children, who typically spend more time near household stoves and are chronically exposed to smoke in poorly ventilated indoor environments. In many rural areas of the Region, these exposures begin early in life, contributing to impaired lung development, increased incidence of acute infections and accelerated progression to chronic respiratory conditions *(34)*.

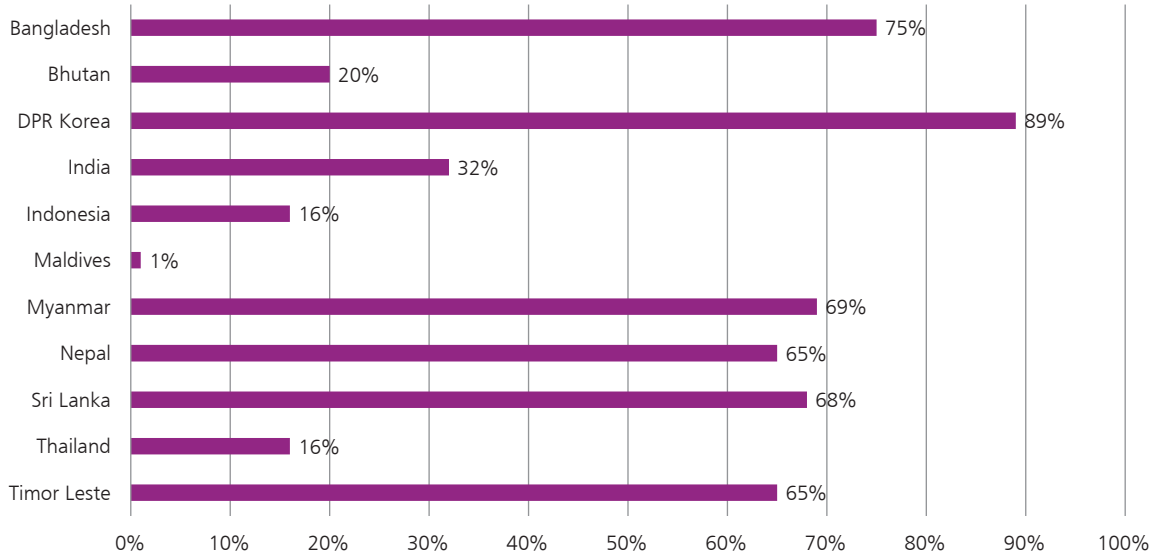
DPR Korea reports the highest reliance, with 89% of the population dependent on polluting fuels, posing a severe risk to respiratory health due to prolonged indoor air pollution exposure. Bangladesh (75%) and Myanmar (69%) also exhibit high dependence on polluting fuels, indicating substantial exposure to harmful indoor air pollutants and a correspondingly greater burden of CRDs. Nepal (65%) and Sri Lanka (68%) report similarly high levels of reliance, contributing significantly to the prevalence of respiratory illnesses in these countries *(35)*.

At the lower end, Maldives demonstrates the lowest dependence, with only 1% of the population using polluting fuels, suggesting minimal associated health risks from indoor air pollution. Bhutan (20%) and India (32%) show moderate dependence, with urban areas likely benefiting from improved access to clean energy sources while rural populations continue to face significant health risks due to exposure to polluting fuels. Indonesia and Thailand, both at 16%, show relatively lower national reliance; however, health risks remain pronounced in rural and remote areas, where access to clean cooking technologies is still limited (Fig. 7).

The wide variation in reliance on polluting fuels across countries in the Region reflects disparities in energy access and household infrastructure, and implementation of clean energy policies. The higher dependence on such fuels is linked to gender inequality, poverty and structural underinvestment in clean energy systems.

To mitigate the CRD burden from household air pollution, countries should accelerate the transition to clean fuels and efficient technologies through multisectoral collaboration, adopting WHO's CHEST to align energy goals with health and environmental planning. Integrating these efforts into broader health system strategies under universal health coverage (UHC) and climate resilience is essential. Progress should be monitored against SDG Target 7.1.2, with attention to equity through data disaggregation. Scaling up clean energy must be embedded in national CRD strategies as both a public health necessity and a gender-equity imperative.

Fig. 7. Proportion of population with primary reliance on polluting fuels and technologies for cooking (%) in 2020



Source: World Health Organization 2025 data.who.int, Proportion of population with primary reliance on clean fuels (%) (indicator)

2.3 Tobacco smoke

Tobacco use, primarily through smoking, is one of the most significant and well-established risk factors for CRDs. It is directly linked to the onset and progression of conditions such as COPD and exacerbation of asthma, key contributor to the burden of CRDs in the WHO SE Asia Region. Smoking introduces harmful chemicals into the respiratory system, leading to inflammation, airway narrowing and progressive lung damage. It irritates and destroys lung tissue, resulting in chronic inflammation, reduced lung function and heightened susceptibility to respiratory infections. Over time, smoking can cause irreversible damage to the lungs, and is a major driver of premature morbidity and mortality from respiratory conditions.

In the Region, the prevalence of current tobacco smoking among adults aged 15 years and above stands at 13%, with a marked gender disparity: 24% among men compared with 1% among women *(36)*. This gender gap reflects deep-rooted sociocultural patterns and poses specific policy challenges to addressing men's health risks while protecting women and children from second-hand exposure.

There has been a gradual decline in tobacco smoking in the Region from approximately 16% in 2015 to a projected 10.4% by 2030, driven in part by the adoption of WHO-recommended "Best Buy" interventions. These include comprehensive tobacco control measures such as excise taxes, smoke-free legislation, pictorial health warnings, advertising bans, public smoking bans, awareness campaigns and cessation support.

However, despite these gains, tobacco-related CRD risk remains high due to several emerging concerns in the Region:

(1) Youth and ENDS: The increasing popularity of electronic nicotine delivery systems (ENDS), especially among adolescents and young adults, presents a new challenge in tobacco regulation. While ENDS are not widely prevalent across countries of the WHO SE Asia Region yet, their growth in urban areas calls for urgent attention to protecting youths from nicotine addiction and its long-term respiratory consequences.

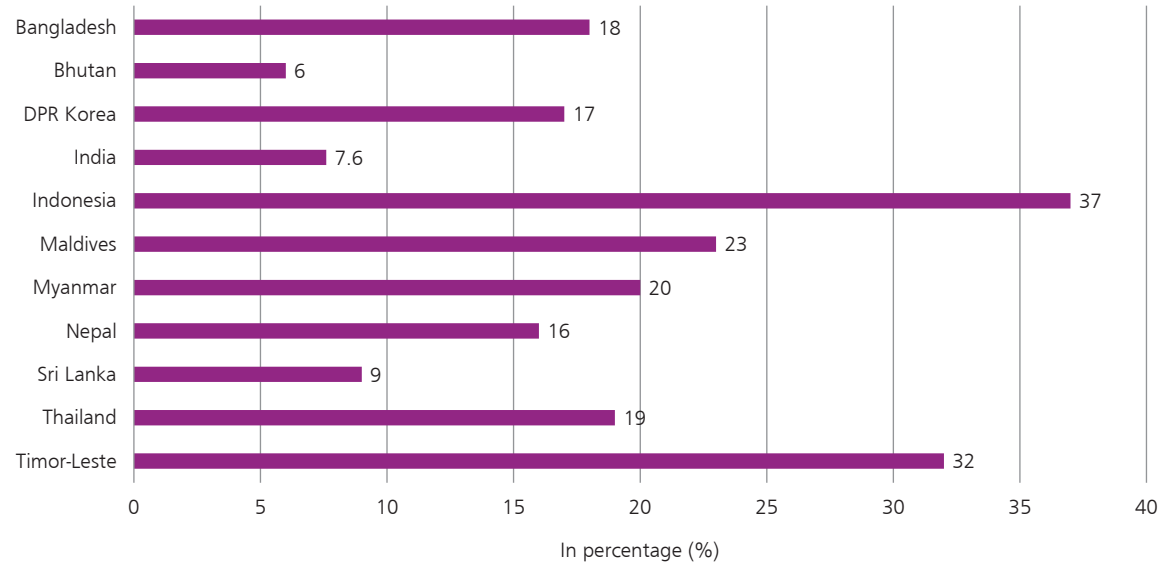
(2) Policy gaps and enforcement: Inconsistent implementation and enforcement of tobacco control policies across SE Asia Region countries limit progress. For instance, while taxation is an effective measure, tobacco products remain widely affordable in many countries due to weak fiscal policies.

The prevalence of smoking varies across countries in the Region, with some countries reporting very high smoking rates while others show relatively lower levels (Fig. 8) *(34)*. Tobacco use in the Region poses a substantial risk of CRDs, with higher smoking rates leading to an increased incidence of respiratory conditions. As indicated by data, countries with higher smoking rates generally bear a greater health burden related to CRDs.

Indonesia stands out with the highest prevalence of tobacco smoking estimated at 37%, highlighting a severe risk factor for respiratory diseases. Countries such as Timor-Leste (32%), Myanmar (20%), Thailand (19%) and Bangladesh (18%) also report relatively high smoking rates, contributing to a significant burden of CRDs. DPR Korea (17%) and Nepal (16%) show moderate smoking rates, which still pose a significant health risk, especially among men who have traditionally shown higher smoking prevalence *(37)*.

At the lower end, Bhutan (6%) and India (7%) report the lowest rates of current tobacco smoking, which may reflect effective tobacco control policies. However, smoking remains a concern in certain population groups. Maldives (23%) and Sri Lanka (9%) report moderate levels of tobacco use, contributing to the CRD burden in their populations (Fig. 8).

Fig. 8. Prevalence of current tobacco smoking among adults aged 15+ years (age-standardized estimate) (%), both sexes, 2022



Source: The Global Health Observatory

*Current tobacco smokers: The percentage of the population aged 15 years and over, who currently smoke any tobacco product on a daily or non-daily basis; smoked tobacco products include cigarettes, pipes, cigars, cigarillos, waterpipes (hookah, shisha), *bidi*s, *kretek* and heated tobacco products. Smoked tobacco products exclude e-cigarettes (which do not contain tobacco), "e-cigars", "e-hookahs", JUUL and "e-pipes".

The significant intercountry variation calls for tailored, country-specific tobacco control strategies, supported by regional cooperation through mechanisms such as the WHO Framework Convention on Tobacco Control (FCTC). Additionally, integrating tobacco cessation into primary health care and CRD management protocols, such as those under the WHO Package of Essential Noncommunicable Disease Interventions for primary health care and HEARTS packages [comprises six modules and an

implementation guide. H – Healthy-lifestyle counselling; E – Evidence-based treatment protocols; A – Access to essential medicines and technology; R – Risk-based CVD management; T – Team-based care; S – Systems for monitoring], can strengthen early intervention and reduce the long-term respiratory burden.

Ultimately, sustained political will, increased taxation, strong enforcement, public awareness campaigns and youth-focused interventions are essential to curbing tobacco-related CRD morbidity and mortality in the SE Asia Region.

2.4 Exposure to second-hand smoke

Second-hand smoke (SHS), also known as passive smoking, is a major contributor to the burden of CRDs in the WHO SE Asia Region. Classified as a Group 1 carcinogen by the International Agency for Research on Cancer (IARC), SHS contains over 7000 harmful chemicals and is causally linked to asthma, COPD, lower respiratory infections and increased severity of existing respiratory conditions.

SHS exposure is particularly common in domestic environments across the SE Asia Region, disproportionately affecting women and children, who are more likely to be exposed in domestic settings. Children and non-smoking adults, especially those in households and workplaces with regular SHS exposure, face increased health risks due to their prolonged and often involuntary exposure. Analysis of Global Youth Tobacco Survey at the national level reveals that SHS exposure – defined as exposure for more than one day, during the past seven days, inside any enclosed public place – among adolescents aged 13–15 years was alarmingly high. The exposure was highest in Timor-Leste (71%), Indonesia (66.2%) and Bangladesh (59%); India reported the lowest exposure (22.2%) (Table 8) *(38)*.

Table 8. Percentage of students aged 13–15 years exposed to tobacco smoke inside any enclosed public place during the past seven days

Country	Survey year	Percentage of adolescents (13–15 years) exposed to SHS in enclosed public places (in the past 7 days)
Bangladesh	2013	59
Bhutan	2019	36.6
DPR Korea	NA	No data
India	2019	22.2
Indonesia	2019	66.2
Maldives	2019	47
Myanmar	2016	28.4
Nepal	2011	48.6
Sri Lanka	2015	35.7
Thailand	2022	32.4
Timor-Leste	2019	71

Long-term passive smoking not only exacerbates pre-existing respiratory conditions but also plays a critical role in the onset of new respiratory illnesses. Given its widespread impact, particularly among vulnerable groups, reducing second-hand smoke exposure is vital to mitigating the regional burden of CRDs.

2.5 Occupational exposure to dust or smoke

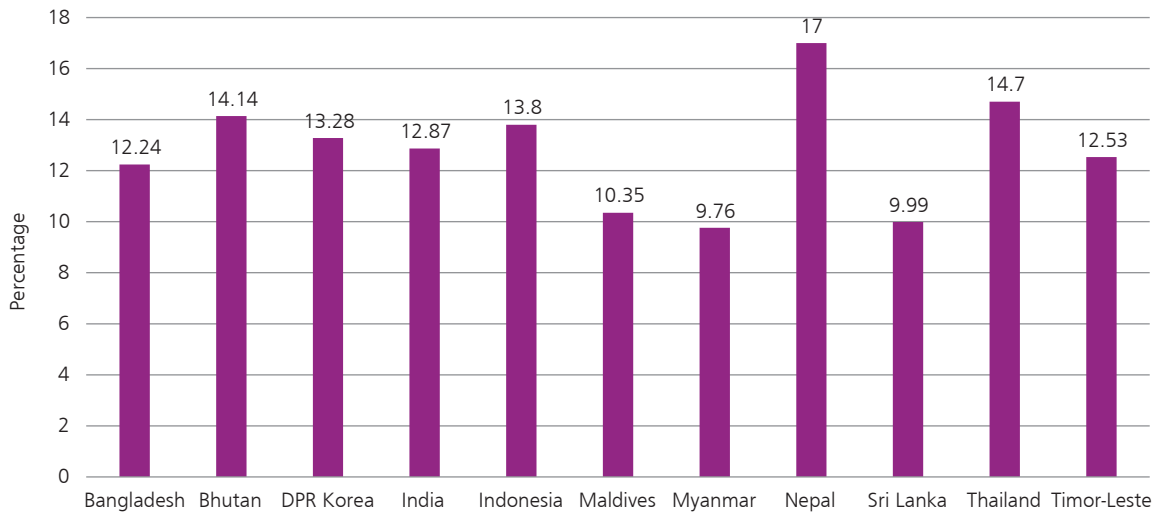
Occupational exposure to airborne particulates, gas and fumes remains a significant yet under-prioritized driver of CRDs across the Region. Millions of workers across the Region, particularly in the informal sector, are regularly exposed to harmful, airborne pollutants in their workplaces. This exposure is strongly associated with the development of chronic respiratory conditions such as COPD, pneumoconiosis and occupational asthma. Occupational exposure refers to the inhalation of hazardous particles, gases or fumes encountered during work activities at workplaces, such as:

- construction (cement, silica dust, wood, brick kiln);
- mining and quarrying (coal, stone dust);
- textile (cotton dust);
- agriculture (grain dust, smoke from field burning); and
- manufacturing and welding (metal fumes, chemical dust).

While exposure occurs across all countries, risks are especially concentrated in informal, unregulated sectors, where use of personal protective equipment (PPE) is limited, occupational health services are lacking and labour laws are poorly enforced. In these environments, workers often endure chronic exposure without routine surveillance, compensation mechanisms or access to preventive services.

Due to limited studies in the Region, the prevalence of occupational exposure to airborne particulate matter in the Region is difficult to assess. GBD 2021 provides Region- and country-wise data on deaths from CRDs attributable to occupational exposure to airborne particulate matter. The proportion of CRD deaths attributable to occupational exposure to particulate matter, gases and fumes varies across countries, ranging from 9.76% in Myanmar to 17% in Nepal (Fig. 9).

Fig. 9. Proportion of CRD deaths attributable to occupational exposure in countries of the South-East Asia Region, 2021



Source: Global Burden of Disease, 2021

To effectively reduce occupational CRD risk in the Region, countries must strengthen enforcement of occupational safety and health standards, especially in the informal sector, to expand access to occupational health services within primary care and establish mandatory surveillance systems for high-risk exposures. Training programmes and provision of PPE are essential, particularly for small-scale and rural enterprises. National strategies should align with WHO/ILO guidance and ILO Convention

C155, ensuring integration of labour, health and environmental policies *(39)*. Addressing occupational exposures is not only a preventable intervention but a critical pillar in national CRD control efforts as well.

Major risk factors for CRDs in the SE Asia Region

- Air pollution: $PM_{2.5}$ levels exceed WHO limits by ~9x in two countries of the Region.
- Household air pollution: More than half of the countries report that more than 65% of their populations rely on polluting fuels for cooking.
- Tobacco use: Adult smoking prevalence exceeds 20% in about one third of the countries, with particularly high rates among men. SHS exposure among adolescents and women remains widespread.
- Occupational exposure: This is common across the Region, especially in informal sectors such as construction, mining, agriculture and textile industries, which are often without adequate protective measures or enforcement of occupational safety hazards.

2.6 Other important risk factors in the regional context

Malnutrition

Malnutrition – both undernutrition and overnutrition – is another risk factor for CRDs in the Region. Underweight individuals (BMI <18.5 kg/m²) often suffer from weakened respiratory muscles and compromised immune function, making them more vulnerable to infections and exacerbations of diseases such as COPD and asthma. On the other hand, obesity (BMI ≥30 kg/m²) reduces lung volume and compliance, leading to shallow breathing and shortness of breath, and contributes to chronic low-grade inflammation that can worsen asthma and COPD symptoms.

The Region faces a dual burden: countries such as Myanmar, India and Bangladesh report high rates of undernutrition (underweight) among adults, with prevalence of 14.1%, 13.9% and 13.2% respectively, while countries such as Maldives and Sri Lanka are witnessing a rise in obesity, with adult obesity rates of 17% and 11% respectively *(40)*. This coexistence of underweight and obesity complicates public health interventions and there is need for integrated strategies to address nutritional imbalances to reduce the burden of CRDs across the population.

Physical inactivity

Physical inactivity not only contributes to systemic inflammation and poor cardiovascular health, but also directly affects lung function. Sedentary lifestyles reduce respiratory muscle strength, impair mucociliary clearance and worsen breathlessness. WHO recommends that adults engage in at least 150 minutes of moderate-intensity or 75 minutes of vigorous-intensity physical activity per week. Failure to meet these guidelines is considered insufficient physical activity.

Physical inactivity also contributes to respiratory health risks, with India having the highest rate estimated at 49%, while countries such as Nepal and Timor-Leste report significantly lower rates (8%), suggesting healthier lifestyles. Promoting physical activity through structured pulmonary rehabilitation programmes, community-based exercise interventions and awareness campaigns is essential for preventing and managing CRDs *(41)*.

Post-tuberculosis lung disease (PTLD)

With the SE Asia Region accounting for a large share of the global TB burden, PTLD is an emerging but under-addressed driver of CRDs in the Region. Even after successful TB treatment, many individuals suffer

from residual lung damage, ranging from bronchiectasis to restrictive ventilatory defects that predispose them to long-term disability and poor quality of life. Routine pulmonary follow-up and integration of CRD services into TB programmes are urgently needed to address this silent contributor to CRD-related morbidity.

The other possible risk factors for CRDs include underlying socioeconomic determinants, non-modifiable risk factors such as age and heredity, raised blood pressure, raised cholesterol, unhealthy diet and post-infectious chronic respiratory diseases.

Comparison of risk factor prevalence and CRD burden in WHO South-East Asia Region countries

The comparison highlights considerable variation in risk factors and CRD burden across the WHO SE Asia Region (Table 9). Countries such as Bangladesh, DPR Korea and Myanmar show high $PM_{2.5}$ exceedance, elevated use of polluting fuels and higher COPD prevalence, suggesting compounded environmental and behavioural risks. Timor-Leste and Indonesia also exhibit high tobacco use correlating with moderate asthma and COPD rates. In contrast, Maldives shows low levels of air pollution and use of polluting household fuels, with correspondingly lower COPD and asthma prevalence. DPR Korea records the highest COPD (3.88%) and asthma (4.74%) prevalence, whereas Indonesia (37%) and Timor-Leste (32%) have the highest tobacco smoking prevalence. Countries with higher environmental and behavioural risk factors generally demonstrate higher COPD and asthma prevalence.

Table 9. Comparison of risk factor prevalence and CRD burden in WHO South-East Asia Region countries

Country	Exceedance of WHO ($PM_{2.5}$) guidelines (by a multiple of) in 2020	Prevalence of current tobacco smoking among adults aged 15+ years (2022)	Primary reliance on polluting fuels and technology (%) (2020)	COPD prevalence (%) (2021)	Asthma prevalence (%) (2021)
Bangladesh	9	18	75	2.81	2.16
Bhutan	5	6	20	2.6	1.82
DPR Korea	8	17	89	3.88	4.74
India	9	7	32	2.82	2.66
Indonesia	4	37	16	2.12	2.61
Maldives	3	23	1	1.84	1.9
Myanmar	5	20	69	2.64	2.03
Nepal	7	16	65	2.55	1.89
Sri Lanka	5	9	68	2.64	4.18
Thailand	5	19	16	3.12	3.47
Timor-Leste	7	32	65	1.65	3.52

3 Regional and national response to prevent and manage chronic respiratory diseases (CRDs)

3.1 Preventing risk factors for chronic respiratory diseases

Mitigating risk factors plays a vital role in reducing the burden of CRDs. Preventing CRDs requires a comprehensive, multisectoral approach that addresses the various risk factors contributing to their development. The updated Appendix 3 of the Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2030 outlines several cost-effective interventions that can help in reducing multiple risk factors for CRDs. At the regional level, countries have committed to mitigate risk factors through the resolutions of the Regional Committee for South-East Asia. Notable such resolutions include:

SEA/RC68/R7: Dili Declaration on Tobacco Control *(42)*;

SEA/RC69/R5: Strategic Action Plan to reduce the double burden of malnutrition in the South-East Asia Region 2016–2025 *(43)*; and

SEA/RC72/R4: Regional Plan of Action for the Global Strategy on Health, Environment and Climate Change 2020–2030: healthy environments for healthier population *(44)*.

These regional frameworks provide political and operational platforms for action. All countries in the Region have established multisectoral action plans that guide countries to work with non-health sectors on priority interventions. Nine countries in the Region reported having a national multisectoral commission, agency or mechanism to oversee NCD engagement, policy coherence and accountability across sectors beyond health *(20)*. Countries are conducting several interventions to mitigate risk factors. In the sections below, interventions taken by countries to mitigate key CRD risk factors have been mapped to identify opportunities and challenges in the CRD context.

3.1.1 Measures to reduce concentration of particulate matters in air

The Regional Plan of Action for the WHO Global Strategy on Health, Environment and Climate Change is being implemented in the Region. It provides a strategic framework for Member States to tackle air pollution. Within the Region, countries belonging to the Association of Southeast Asian Nations (ASEAN) are developing plans or collective action on climate change and air pollution. The Asia Pacific Regional Forum on Health and Environment has identified the significance of transboundary air pollution in the Region, while several alliances such as the Climate and Clean Air Coalition have committed to protecting the climate and improving air quality.

WHO-SEARO has released the new global air quality guidelines that have adjusted almost all the acceptable levels of different pollutants downwards, following increasing evidence that shows how air pollution affects health.

BreathLifeCampaign: Maldives became the first BreatheLife member in the Region in 2019. Eleven cities across India, Indonesia and Nepal have now joined the campaign, which is promoting and sharing clean air solutions that will have an immense impact on people living in these cities, now and in the future.

In the Region, nine countries – with the exception of DPR Korea and Timor-Leste – are parties to regional or international conventions/treaties addressing transboundary air pollution. Among them, four countries, namely Bangladesh, India, Sri Lanka and Thailand, have established national ambient air

quality standards for annual $PM_{2.5}$ concentrations *(40)*. However, their standards for annual $PM_{2.5}$ values are not aligned with WHO air quality guidelines or interim targets for annual $PM_{2.5}$ levels (Table 10). This gap reflects ongoing challenges in air quality management, enforcement and pollution control.

Table 10. National responses and regulatory frameworks to address and reduce particulate matter $PM_{2.5}$ concentrations in the air

	Country is party to a regional/ international convention/treaty on transboundary air pollution* (2022)	Country has established ambient air quality standards for annual $PM_{2.5}$ (2022)	Standards for annual $PM_{2.5}$ values align with WHO air quality guidelines or interim targets (2022)**	Country has established ambient air quality standards for annual PM_{10} (2022)
Bangladesh	Yes	Yes	Partially achieved	Yes
Bhutan	Yes	No	Not available	Yes
DPR Korea	No	No	Not available	No
India	Yes	Yes	Not achieved	Yes
Indonesia	Yes	Yes	Not achieved	Yes
Maldives	Yes	No	Not available	No
Myanmar	Yes	No	Not available	No
Nepal	Yes	No	Not available	No
Sri Lanka	Yes	Yes	Partially achieved	Yes
Thailand	Yes	Yes	Partially achieved	Yes
Timor-Leste	No	No	Not available	No

* The country is a party to one of the following treaties relating to transboundary air pollution: 1) the United Nations Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution (CLRTAP) or 2) the ASEAN Agreement on Transboundary Haze Pollution (Haze agreement) or 3) the Malé Declaration on Control and Prevention of Air Pollution and its likely transboundary effects for South Asia.

** If the national standard is equal to or below the WHO air quality guidelines (AQG), it is fully achieved; if it is between AQG and the highest interim target (IT), it is partially achieved and if it is above the highest IT, it is not achieved.

Nations facing higher levels of particulate pollution would greatly benefit from strengthened air quality control policies, urban planning interventions and public health strategies aimed at mitigating environmental risk factors for CRDs.

3.1.2 Measures to reduce population with primary reliance on polluting fuels and technologies causing indoor air pollution

WHO defines clean fuels and technologies for health at the point of use as including solar, electricity, biogas, liquefied petroleum gas (LPG), natural gas, alcohol fuels and biomass stoves that meet the emission targets outlined in the WHO Global Air Quality Guidelines (2021). To support countries in implementing these guidelines and reducing reliance on polluting fuels and technologies that contribute to indoor air pollution, WHO has developed the Clean Household Energy Solutions Toolkit (CHEST). The Toolkit provides a step-by-step approach and a variety of tools to assist in the transition to clean household energy, including policy development and implementation strategies *(17)*.

In addition, the Benefits of Action to Reduce Household Air Pollution (BAR-HAP) Tool helps stakeholders evaluate the costs and benefits of different interventions aimed at reducing household air

pollution from cooking. It enables users to model transitions from polluting stoves and fuels to cleaner alternatives, supporting evidence-based decision-making *(45)*.

Several countries in the Region have undertaken national-level initiatives to reduce indoor air pollution. A foundational step is the development and enforcement of national action plans (NAPs) for household energy transitions. In the Region, five countries (Bangladesh, India, Indonesia, Myanmar and Nepal) have an operational policy, strategy or action plan to provide access to clean fuels and technologies to increase access to clean fuels and technologies for cooking or heating, as of 2022 *(40)*. This could be either an energy policy, strategy or action plan or the inclusion of household energy in an integrated NCD policy, strategy or action plan.

Examples of national initiatives include:

- India: The Pradhan Mantri Ujjwala Yojana (PMUY) has provided over 80 million subsidized LPG connections to low-income households, contributing to increasing clean fuel adoption in rural areas *(46)*.
- Bangladesh: Programmes have been launched to distribute improved cookstoves and promote the use of LPG, reducing reliance on biomass fuels *(47)*.
- Thailand: The government has developed supportive policies for clean energy transition, including financial subsidies and public awareness campaigns *(48)*.
- Indonesia: The Mega Conversion Programme facilitated a large-scale transition from kerosene to LPG for household cooking *(49)*.

3.1.3 Measures for tobacco control, including reducing exposure to second-hand tobacco smoke

Addressing tobacco smoking, including exposure to second-hand smoke, is crucial for the prevention of CRDs in the Region. The WHO FCTC provides a comprehensive set of evidence-based measures to reduce tobacco consumption and exposure to tobacco smoke.

Resolution 'SEAHEARTS: Accelerating Prevention and Control of Cardiovascular Diseases in the South-East Asia Region (SEA/RC76/R5)', endorsed by the Seventy-sixth Session of the WHO Regional Committee for South-East Asia, is committed to covering one billion people by at least three WHO MPOWER measures, with the highest level of achievement by 2025 for tobacco control.

Over the past two decades, countries in the SE Asia Region have made notable progress in implementing WHO FCTC measures. The 2024 report, "Two decades of WHO FCTC implementation in the South-East Asia Region", reviewed these efforts, highlighting both achievements and areas that require further attention. All SE Asia Region countries are implementing the WHO MPOWER package of tobacco control strategies and all except Indonesia are parties to the WHO FCTC *(50)*.

Implementing comprehensive smoke-free laws in public places is a critical intervention. As of 2024, nine countries have enacted such laws, significantly contributing to reduced exposure to second-hand smoke. Notably, Nepal and Thailand have made all public places completely smoke-free.

The Region is performing well in implementing large graphic health warnings, with seven countries – Bangladesh, India, Myanmar, Nepal, Sri Lanka, Thailand and Timor-Leste – showcasing strong political commitment. Thailand has also implemented plain packaging, setting a global example.

Sri Lanka, Thailand and Timor-Leste are actively conducting regular national anti-tobacco campaigns that meet recommended international standards. Maldives and Nepal have imposed comprehensive

bans on all forms of tobacco advertising, promotion and sponsorship (TAPS). Thailand is part of the best-practice group by levying cigarette taxes that account for at least 75% of the retail price, with the current rate estimated at 81.3% *(51)*.

Regarding electronic nicotine delivery systems (ENDS), they are banned in DPR Korea, India, Nepal, Sri Lanka, Thailand and Timor-Leste, and regulated in Maldives.

Table 11. Key policy and programmatic interventions by countries for tobacco control, including measures to reduce second-hand smoke exposure

	Existence of operational policy/strategy/ action plan to decrease tobacco use (2024)	Party to the WHO Framework Convention on Tobacco Control (2024)	Has implemented measures to eliminate exposure to second-hand tobacco smoke in all indoor workplaces, public places and public transport (2024)*	Has implemented effective mass media campaigns that educate the public about the harms of smoking/tobacco use and second-hand smoke (2024)**
Bangladesh	Yes	Yes	Partially achieved	Partially achieved
Bhutan	Yes	Yes	Partially achieved	Partially achieved
DPR Korea	Yes	Yes	Partially achieved	Fully achieved
India	Yes	Yes	Partially achieved	Partially achieved
Indonesia	Yes	No	Fully achieved	Not achieved
Maldives	Yes	Yes	Partially achieved	Not achieved
Myanmar	Yes	Yes	Partially achieved	Partially achieved
Nepal	Yes	Yes	Fully achieved	Partially achieved
Sri Lanka	Yes	Yes	Partially achieved	Partially achieved
Thailand	Yes	Yes	Fully achieved	Fully achieved
Timor-Leste	Yes	Yes	Partially achieved	Not achieved

*Country has all its public places completely smoke-free (or at least 90% of the population covered by complete subnational smoke-free legislation). "Completely" means smoking is not permitted, with no exemptions allowed, except in residences and indoor places that serve as equivalents to long-term residential facilities, such as prisons and long-term health and social care facilities, including psychiatric units and nursing homes. Ventilation and any form of designated smoking rooms and/or areas do not protect one from the harms of second-hand tobacco smoke and the only laws that provide protection are those that result in the complete absence of smoking in all public places.

**Country has implemented a national anti-tobacco mass media campaign designed to support tobacco control, of at least three weeks' duration, with all appropriate characteristics. Appropriate characteristics include: • campaign was part of a comprehensive tobacco control programme; • before the campaign, research was undertaken or reviewed to gain a thorough understanding of the target audience; • campaign communications materials were pre-tested with the target audience and refined in line with campaign objectives; • air time (radio, television) and/or placement (billboards, print advertising, etc.) were obtained by purchasing or securing it using either the organization's own internal resources or an external media planner or agency (this information indicates whether the campaign adopted a thorough media planning and buying process to effectively and efficiently reach its target audience); • the implementing agency worked with journalists to gain publicity or news coverage for the campaign; • process evaluation was undertaken to assess how effectively the campaign had been implemented; • an outcome evaluation process was implemented to assess campaign impact; and • the campaign was aired on television and/or radio.

3.1.4 Vaccination to prevent respiratory infection: Influenza, pneumococcal, Haemophilus influenzae type b (Hib)

Vaccines are essential for preventing severe respiratory infections (e.g., influenza, pneumonia, Hib), especially in young children, the elderly and those with chronic conditions. Respiratory infections often

trigger acute exacerbations in chronic conditions such as asthma and COPD. Repeated severe infections are associated with fibrosis and permanent lung damage, further accelerating disease progression. In the South-East Asia Region, vaccination coverage for the main respiratory pathogens – seasonal influenza, *Streptococcus pneumoniae* and Hib – varies across countries.

WHO recommends yearly influenza vaccination, prioritizing pregnant women, health-care workers, children, the elderly and individuals with chronic medical conditions. However, vaccine uptake across the SE Asia Region remains inconsistent. Bhutan, India and Thailand have national influenza vaccination policies. The national vaccination rates for under-five children, individuals with chronic medical conditions, health-care workers, older adults aged >65 years and pregnant women were 74.09%, 100%, 50.41%, 78.71% and 49.30% respectively for Bhutan, and 2.14%, 27.8%, 47%, 43.3% and 8.3% for Thailand in 2023. Limited vaccine production and weak policy adoption hinder broader uptake *(52, 53)*.

The pneumococcal conjugate vaccine (PCV) coverage in SE Asia Region averages 79%, though India's remains low (15%–20% in 2021) *(54,55)*. The vaccine has significantly reduced disease burden and mortality. Inclusion in routine childhood immunization schedules, particularly in countries with high child mortality rates, is recommended.

The Hib3 (third dose of Hib vaccine) coverage is also around 89%. *Haemophilus influenzae* type b vaccination averted approximately 601 000 child deaths in the WHO SE Asia Region between 1974 and 2024 *(56)*.

Expanding access to these vaccines aligns with the WHO Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhoea (GAPPD) and the Immunization Agenda 2030, both of which aim to ensure equitable access to life-saving vaccines and reduce vaccine-preventable deaths *(57)*.

Key messages

- Indoor air pollution remains a major CRD risk in the Region, particularly due to the high reliance on polluting fuels for cooking. Five countries have policies promoting clean energy use.
- Preventing CRDs requires a comprehensive, multisectoral approach, addressing air pollution, indoor smoke, tobacco use and infections.
- Air pollution control remains a challenge; only a few countries have ambient $PM_{2.5}$ standards and many are not aligned with WHO guidelines.
- There has been significant progress in tobacco control through smoke-free laws, mass media campaigns and taxation, although gaps still exist.
- Vaccination against influenza, pneumococcus and Hib prevents severe respiratory infections that exacerbate CRDs; vaccine coverage varies widely.
- Regional cooperation through conventions such as the ASEAN Agreement on Transboundary Haze Pollution is a promising step, but enforcement and alignment of national $PM_{2.5}$ standards with WHO guidelines remain limited – only four countries have established standards and none have fully met WHO targets.
- Second-hand smoke exposure continues to pose significant risks, especially for women and adolescents.
- Implementation of clean energy initiatives, such as India's PMUY and Indonesia's Mega Conversion Programme, has demonstrated potential for large-scale transitions to LPG, yet sustained political commitment and multisectoral financing are needed to expand coverage and adoption across other countries.
- The Region demonstrates strong political will in some areas of tobacco control, e.g. Thailand's plain packaging, high cigarette taxation and widespread pictorial health warnings.

Mitigating COPD risk in a Sri Lankan farmer

Ajith, a 45-year-old farmer from rural Matale, Sri Lanka, had no history of smoking but began experiencing breathlessness after long days in the field and at home. He cooked with firewood in a poorly ventilated kitchen and worked in dusty environments.

Ajith was at risk of developing COPD due to prolonged exposure to indoor air pollution and occupational dust, even without smoking. Early symptoms included mild wheezing and shortness of breath, especially after physical exertion.

During a community health screening, the local primary health care team identified Ajith's risk factors for COPD. The following preventive actions were recommended:

- Improved kitchen ventilation: Install a low-cost chimney to reduce indoor smoke accumulation and improve air quality.
- Use protective equipment: Encourage Ajith to wear a cloth mask while farming to minimize dust inhalation.
- Health education: Offer counselling on COPD prevention, emphasizing the avoidance of second-hand smoke and air pollution.
- Regular checkups: Introduce spirometry testing to monitor lung function and detect early signs of deterioration.

Six months later, Ajith's symptoms had resolved. His lung function remained normal, and he became a vocal advocate for cleaner cooking and workplace safety in his village.

Credit: Dr Saroj Jayasinghe, Emeritus Professor, Internal Medicine, University of Colombo, Sri Lanka

Smoke-free Bagan: A heritage-driven model for CRD prevention

Myanmar's Bagan, known for its vast plain dotted with ancient temples, was recognized as a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site in 2019. Steeped in deep cultural and historical significance, Bagan shoulders the responsibility of ensuring a healthy environment for both its residents and the large number of domestic and international tourists who visit the city each year. In response to increasing health concerns, particularly the burden of tobacco-related diseases, Bagan launched an initiative aimed at creating a smoke-free environment. This initiative directly contributes to the prevention of chronic respiratory diseases (CRDs), which are major noncommunicable diseases associated with tobacco exposure.

Tobacco use and exposure to second-hand smoke are the leading causes of CRDs. In a city like Bagan, where public spaces include ancient religious sites, hotels, schools and workplaces, the presence of tobacco smoke posed both a public health threat and a risk to the cultural ambience of its heritage zones.

The smoke-free initiative began in 2014, under the **Policy Guidelines for the Establishment of Smoke-Free Areas in the Bagan Heritage Zone**. The Policy called for designation of key locations as "100% smoke-free"; these include heritage monuments, government buildings, hotels, restaurants, schools, pagodas, parks and the Nyaung U airport. A notable feature of the Policy was its strong position against any form of collaboration with the tobacco industry. Implementation was led by the District Governor in collaboration with multiple stakeholders, including the Ministry of Health, Myanmar, People's Health Foundation, WHO, UNESCO, hotel associations, NGOs, pagoda trustees and community members. A Supervisory Committee was established to provide oversight while task forces were formed to enforce compliance with the **Tobacco Products Control Law**. These task forces conducted regular inspections, developed action plans and reported to the Committee on progress and challenges.

Public awareness was prioritized through community engagement, mass media campaigns and the use of visual tools such as graphic health warnings, "No Smoking" posters in hotels and billboards. A prominent city entrance sign, reading *"SMOKE-FREE BAGAN – OUR HERITAGE, OUR PRIDE"*, served as a constant reminder of the city's commitment.

By May 2023, Bagan had successfully established **102 smoke-free zones**, covering its most important cultural and public areas. The initiative reduced public exposure to tobacco smoke, thus decreasing the risk of developing CRDs among residents and visitors. In August 2024, Bagan's efforts were formally recognized when it received the **ASEAN Smoke-Free Award**, positioning the city as a regional leader in tobacco control and CRD prevention. Bagan's smoke-free initiative exemplifies how heritage preservation can be aligned with public health goals. Through strong policy leadership, community engagement and effective enforcement, Bagan created a model for other cities seeking to prevent CRDs.

References:

2024 ASEAN Smoke-Free Award Report https://seatca.org/dmdocuments/ASEAN%20SF%20Award%20Report_Final_29%20July.pdf

Appreciation to Bagan of Myanmar for the ASEAN Smoke-Free Award https://www.mdn.gov.mm/en/appreciation-bagan-myanmar-asean-smoke-free-award

3.2 Services and systems to manage chronic respiratory diseases (CRDs)

Besides prevention, effective health system responses to CRDs must also prioritize accessible, integrated and equitable management across the continuum of care, thus reducing associated morbidity and mortality. WHO PEN 2020 provides a framework to serve as a critical entry point for integrating CRD management into primary health care *(8)*. It outlines a set of cost-effective interventions, mainly core clinical protocols for asthma and COPD, emphasizing task-sharing, essential medicine availability and simplified algorithms. However, implementation across the Region remains uneven. Countries face barriers, including limited diagnostic capacity, stockouts of essential inhaled medicines and insufficient training of frontline providers.

WHO PEN 2020 guides the implementation of fundamental steps to improve NCD management in primary health care, including:

- healthy lifestyle counselling to reduce exposure to risk factors and promote self-care;
- simplified, evidence-based management protocols, including those for asthma and COPD (as outlined in WHO PEN Modules 3, 3.1 and 3.2), along with protocols for promoting healthy lifestyles;
- availability of essential medicines (both oral and inhaled) and diagnostic tools such as peak flow meters;
- team-based care, focusing on enhancing the skills of the health workforce to detect and manage CRDs; and
- robust health information systems to monitor core CRD indicators at the facility level.

The updated Appendix 3 of the Global Action Plan for the Prevention and Control of Noncommunicable Diseases 2013–2030 outlines several cost-effective interventions for CRD management *(7)*, including:

- acute treatment of asthma exacerbations using inhaled bronchodilators and oral steroids;
- acute treatment of COPD exacerbations using inhaled bronchodilators and oral steroids; and
- long-term management of COPD with inhaled bronchodilators.

In the South-East Asia Region, the Colombo Declaration on Strengthening Health Systems to Accelerate the Delivery of NCD Services at the Primary Health Care Level, endorsed at the Sixty-ninth Session of the WHO Regional Committee for South-East Asia, provides strategic guidance for scaling up NCD service delivery at the primary care level *(58)*.

More recently, WHO has intensified its efforts in the Region through the Implementation Roadmap for Accelerating the Prevention and Control of NCDs in South-East Asia 2022–2030, adopted at the Seventy-fifth Session of the WHO Regional Committee for South-East Asia *(59)*. This Roadmap emphasizes the integration of NCD services into primary health care and the use of digital health solutions, although it does not define specific targets for CRD control.

The Evaluation of People-Centred NCD Services (2014–2021) reviewed service delivery performance across the Region and highlighted critical implementation gaps in primary health care, primarily with regard to integration of CRD-specific protocols and indicators. Workforce training is often limited or absent. These issues need to be addressed to improve CRD outcomes *(60)*.

Currently, CRDs often remain undetected and untreated in the Region, resulting in a significant number of individuals not receiving the necessary advice, care and treatment. It is, therefore, crucial to raise awareness and ensure that the diagnosis and management of CRDs are available, accessible and affordable across all levels of the health system.

To move forward, countries must adopt a health systems approach that embeds CRD prevention and care into universal health care platforms, strengthens primary health care (PHC) readiness and promotes continuity of care. This requires aligning CRD service packages with national health benefit schemes, utilizing digital health tools for provider decision support and patient monitoring, and engaging communities in care planning and delivery.

Countries in the South-East Asia Region have implemented several national-level interventions to improve CRD services within primary health care systems. The details of these national responses are presented below.

3.2.1 National operational policy/strategy/action plan for chronic respiratory diseases

Establishing or integrating CRD prevention and management into national policies and health system strengthening is critical. Considering the burden of CRDs, there is a need to implement CRD-specific strategies or include CRDs within broader NCDs, supported by adequate resources, both human and financial. The strategies or action plan should be able to strengthen primary health care with appropriate linkages for addressing the CRD burden. An operational CRD strategy should go beyond clinical guidelines and include system-level provisions for:

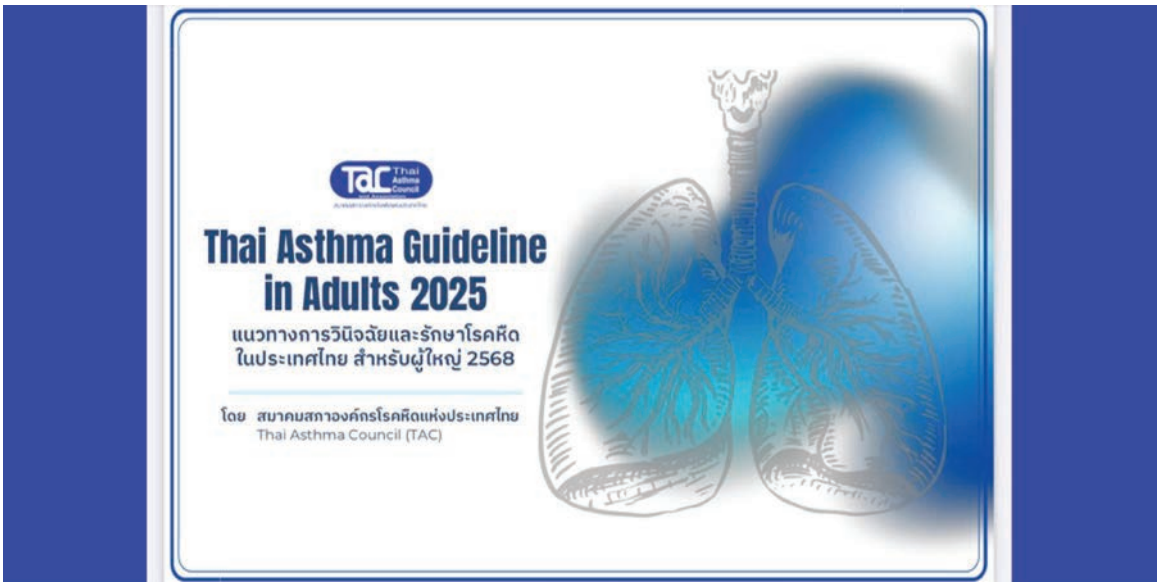
- early detection and routine case-finding at the PHC level;
- standardized treatment pathways including access to essential inhaled medicines;
- rehabilitation and pulmonary care services, including oxygen therapy;
- financial protection mechanisms to reduce out-of-pocket expenditure on diagnosis and long-term treatment; and
- public health interventions to reduce tobacco exposure, indoor air pollution and occupational respiratory risks.

This approach not only improves coverage and equity but also contributes to better health outcomes at a lower cost by preventing complications and reducing the need for costly specialized care.

As of 2023, data from the WHO NCD Country Capacity Survey (NCD CCS) indicate that seven out of 11 countries in the Region have developed CRD-specific policies or integrated CRD components within broader NCD action plans *(20)*. These include national guidelines, multisectoral coordination

mechanisms and inclusion of CRD indicators in national monitoring frameworks. However, gaps remain in operationalization, particularly in rural and lower-tier health facilities, where health worker training, medicine availability and diagnostic tools are limited.

Fig. 10. Operational guideline for chronic respiratory diseases, Thailand



Source: Thai Asthma Council, Thai Asthma Guideline in Adults 2025

Thailand's national asthma guidelines (e.g. Thai Asthma Guideline in Adults 2025) is a strong example of a country-driven, evidence-based approach that links clinical guidance with system-level planning (Fig. 10).

3.2.2 Clinical management guidelines

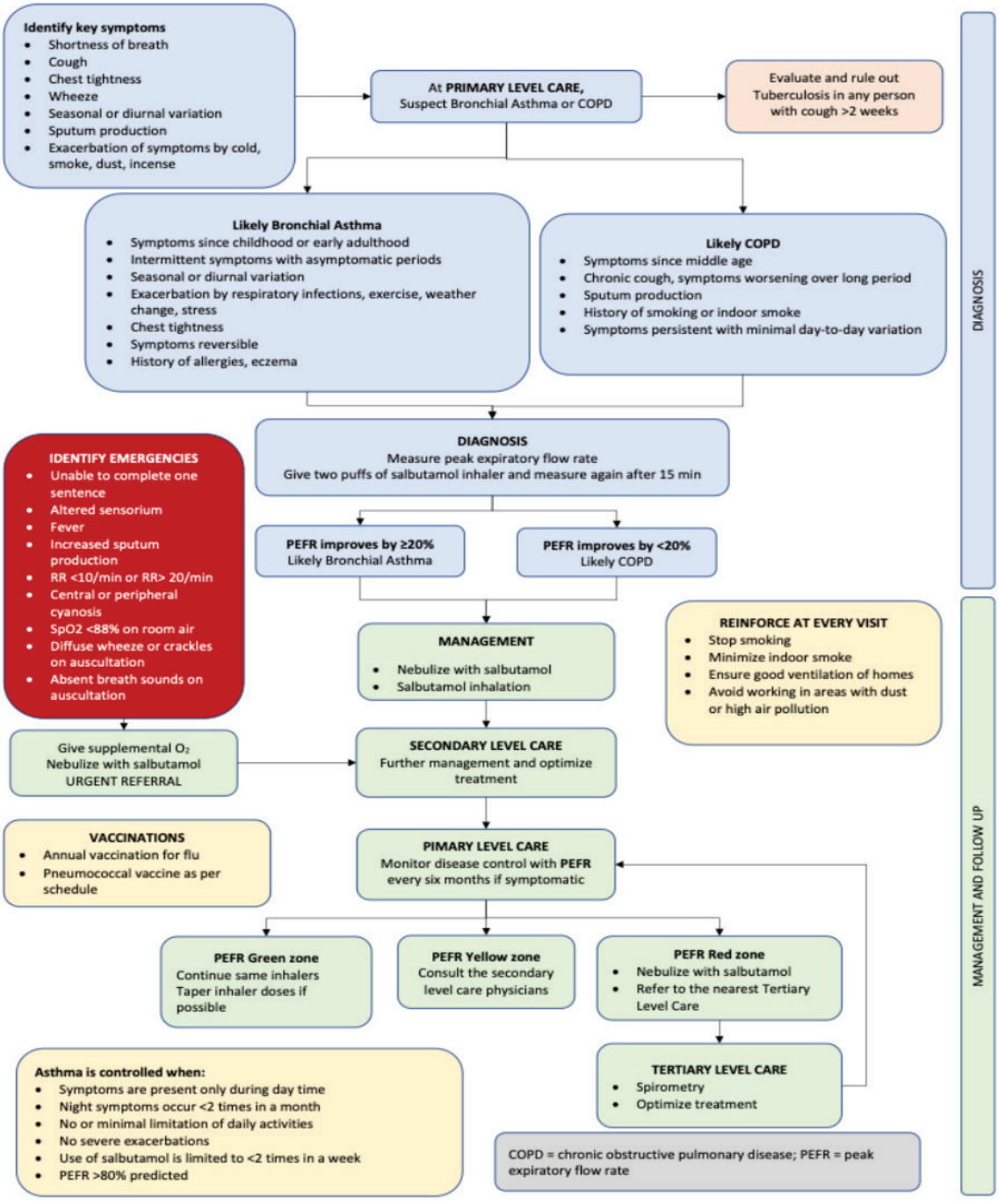
The use of standardized, simplified clinical management protocols – primarily for asthma and COPD – which is drug-and dose-specific and include a core set of medications within primary health care is essential for improving diagnostic accuracy, treatment quality and continuity of care for CRDs. The simpler the protocols and management tools, the more likely they are to be used correctly, and the higher the likelihood that a programme will achieve its goals.

WHO PEN Modules 3, 3.1 and 3.2 provide a step-by-step approach to managing COPD and asthma in primary health care settings. These protocols are designed for use by non-specialist providers in low-resource settings and emphasize symptom recognition, inhaled bronchodilator use and stepwise therapy. Simpler, clearly defined protocols not only reduce clinical variation but also enable task-sharing and reduce diagnostic delays, factors that are especially relevant in the WHO SE Asia Region where PHC providers often operate under significant constraints. The protocol or management guidelines should be updated regularly as new evidence is obtained and disseminated widely to ensure uptake and use.

As per WHO NCD Country Capacity Survey 2023, nine countries (except DPR Korea, Maldives) have reported the availability of national guidelines or protocols for the management of CRDs. All countries that reported having clinical management protocols indicated that these are drug- and dose-specific. Moreover, seven countries (Bangladesh, Bhutan, India, Myanmar, Sri Lanka, Thailand and Timor-Leste) have updated their CRD clinical guidelines since 2019, reflecting responsiveness to evolving evidence and international recommendations (Table 12).

However, challenges persist. Despite the existence of national protocols, utilization at the facility level remains uneven. In at least eight countries, evidence-based guidelines are used in over 50% of health-care facilities; however, this still falls short of universal coverage. Barriers include weak dissemination mechanisms, limited provider training, lack of essential diagnostics (e.g. peak flow meters, spirometry) and stockouts of essential inhaled medications.

Fig. 11. CRD management protocol



Source: Ministry of Health, Royal Government of Bhutan. Chronic Respiratory Disease V3.0

To maximize the impact of national CRD management guidelines, countries need to institutionalize periodic updates aligned with emerging global evidence and revisions of framework and strategies such as WHO PEN. Effective dissemination needs to be embedded within routine in-service training,

supported by digital decision-support tools and integrated supervisory systems to ensure consistent application. Alignment with national essential medicines lists and procurement protocols is vital to secure uninterrupted availability of core CRD medications. Furthermore, coverage and adherence need to be systematically monitored through routine health information systems, using validated quality indicators, specific to CRD care delivery.

Table 12. Details of the evidence-based national guidelines/protocols/standards for the management (diagnosis and treatment) of COPD and asthma in the WHO South-East Asia Region, 2023

	Bangladesh	Bhutan	DPR Korea	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Thailand	Timor-Leste
CRD management guidelines	2020 (COPD and asthma)	2022	–	2023 (COPD and Asthma)	–	–	2020	2018	2020 (COPD and asthma)	2022 (COPD and asthma)	2022 (COPD and asthma)

Evidence-based national guidelines/protocols/standards are available and utilized in at least 50% of health-care facilities.	
Evidence-based national guidelines/protocols/standards are available but NOT utilized in at least 50% of health-care facilities.	
Not available	

3.2.3 Basic technologies for diagnosis and monitoring of CRDs

Effective management of CRDs requires early diagnosis, regular monitoring and continuous treatment – services that depend on the availability of basic technologies in primary health care. According to the WHO PEN module, essential technologies for managing CRDs in primary care include the peak flow meter.

A peak flow meter is a portable device used to measure the peak expiratory flow rate (PEFR), which is important for the diagnosis and monitoring of lung function, particularly in individuals with asthma. Spirometry is a more comprehensive test that measures lung capacity and function. It is considered the gold standard for diagnosing and monitoring management of COPD, and plays a key role in diagnosing and monitoring asthma and other respiratory conditions.

These basic technologies are essential not only for clinical management but also for reducing delays in diagnosis, avoiding unnecessary referrals and preventing disease progression. Their use can significantly reduce the burden on secondary and tertiary facilities while improving health outcomes and system efficiency. However, their effectiveness depends on system-level enablers, including procurement, regular calibration, skilled personnel and integration into routine clinical workflows.

According to the WHO NCD Country Capacity Survey (CCS) 2023, only three countries – India, Maldives and Timor-Leste – reported general availability of both peak flow meters and spirometry at primary care facilities across both public and private sectors. Thailand indicated availability of both technologies only in the private sector. In contrast, Bangladesh, Bhutan, Nepal and Myanmar reported that neither technology is generally available in primary care settings of both public and private sectors,

reflecting significant diagnostic capacity gaps. Sri Lanka and DPR Korea indicated that only peak flow meters are generally available in the public sector, at primary health care facilities (Table 13).

To address these gaps, countries must prioritize the inclusion of diagnostic tools in essential primary care service packages, ensure adequate financing for procurement and maintenance, and align their use with the updated national CRD management protocols and staff training curriculums. Ensuring availability across both public and private sectors is vital for promoting equity and delivering people-centred respiratory care.

It is important to note that basic technologies encompass more than just peak flow meters. Pulse oximeters, spirometer, nebulizers and essential consumables, such as mouthpiece and calibration tools, are also critical for effective diagnosis and management. Where resources allow, nebulizers should also be included as part of the basic technology package to manage acute respiratory symptoms.

Table 13. Details of the availability of the basic technologies for early detection, diagnosis and monitoring of CRDs at the primary care facilities of the public and private health sectors in the WHO South-East Asia Region, 2023

Tests and procedures to diagnose and manage COPD and asthma	Bangladesh	Bhutan	DPR Korea	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Thailand	Timor-Leste
Peak flow meter											
Spirometry											

Available at the primary care facilities of BOTH public and private health sectors	
Available at the primary care facilities of the public health sector ONLY	
Available at the primary care facilities of the private health sector ONLY	
Not available	

3.2.4 Medicines for management of CRDs

The availability, accessibility and affordability of quality essential medicines at all levels of care are a key performance indicator for assessing the functionality of health systems.

According to the WHO PEN protocol and the WHO Model List of Essential Medicines (EML), several medicines are classified as essential for the management of COPD and asthma in primary health care. These include bronchodilators, inhaled corticosteroids, combination inhalers, systemic corticosteroids, and other medications such as theophylline and leukotriene receptor antagonists. While the PEN protocol focuses on medicines suitable for use at the primary care level, the EML covers all levels of the health system. Notably, combination inhalers, though currently not included in the PEN protocol, are listed in the EML. These medicines are also highlighted in the updated Appendix 3 of the Global Action Plan for the Prevention and Control of Noncommunicable Diseases (2013–2030), as part of the recommended "best buys" for managing CRDs.

The first critical step in ensuring access to these medicines is their inclusion in the National Essential Medicines List (NEML). This not only ensures their availability in the public sector but also promotes

rational use by health-care professionals, supporting broader efforts to strengthen primary health care and improve outcomes for people with CRDs.

The details of the CRD medicines available as part of the NELM are tabulated below (Table 14), which indicate the general availability and non-availability of the medicines *(61)*.

Table 14. Details of the availability of the medicines needed for the treatment of CRDs in the National Essential Medicine List

	NELM (year)	Steroid inhaler- (beclomethasone, budesonide) (Yes/No)	Bronchodilator inhaler – salbutamol (Yes/No)	Combination budesonide – formoterol inhaler (Yes/No)
Bangladesh	2024	No	No	No
Bhutan	2023	Yes	Yes	No
DPR Korea	2019	Yes	Yes	Yes
India	2022	Yes	Yes	No
Indonesia	2021	Yes	Yes	No
Maldives	2023	Yes	Yes	Yes
Myanmar	2023	Yes	Yes	Yes
Nepal	2021	No	No	No
Sri Lanka	2022	Yes	Yes	No
Thailand	2021	No	Yes	No
Timor-Leste	2025	Yes	Yes	No

Besides inclusion in the List, it is crucial that the listed medicines are consistently available – at all times, in adequate quantities and appropriate dosages, and with assured quality. The WHO NCD CCS 2023 provides insights into the general availability of essential medicines at the primary health care level – this serves as a key indicator of access.

According to the WHO NCD CCS 2023, steroid inhalers were reported to be generally available at more than 50% of the pharmacies at the public-sector primary health care facilities in seven countries: Bhutan, DPR Korea, Indonesia, Maldives, Myanmar, Sri Lanka and Timor-Leste (Table 15).

The combination inhaler of budesonide-formoterol was reported to be generally available at over 50% of the public-sector pharmacies in DPR Korea, Maldives and Myanmar.

Bronchodilator inhalers were reported as generally available at more than 50% of the public primary health care pharmacies in all countries, except Bangladesh and Nepal.

In addition, to support tobacco cessation, nicotine replacement therapy (NRT) was reported to be available in DPR Korea, India and Maldives, while other pharmacotherapies, such as bupropion and varenicline, remain largely inaccessible in the Region's public sector.

Despite progress in listing essential CRD medicines, systemic barriers remain across the Region, particularly around affordability, supply chain reliability and rational prescribing. Inhaler technique is often poorly taught and adherence support remains limited, especially in rural and underserved populations, resulting in suboptimal treatment outcomes.

Table 15. Details of the availability of the medicines needed for the treatment of CRDs at the primary health care facilities of the public sector in the WHO South-East Asia Region, 2023

	Bangladesh	Bhutan	DPR Korea	India	Indonesia	Maldives	Myanmar	Nepal	Sri Lanka	Thailand	Timor-Leste
Steroid inhaler											
Combination budesonide-formoterol inhaler											
Bronchodilator inhaler											
Nicotine replacement therapy											
Tobacco cessation aids (e.g. bupropion, varenicline)											

Generally available: at 50% or more pharmacies	
Generally not available: at less than 50% of the pharmacies	
Don't know	

A model for integrated CRD management in a primary health care setting, Bhutan

Chronic respiratory diseases, including asthma and COPD, contribute significantly to global morbidity and mortality. In Bhutan, where over 60% of the population resides in rural areas and relies on public health services, integrated CRD management within the broader NCD framework has proven effective in addressing these conditions.

In Bhutan, CRDs account for approximately 12% of all deaths.[1] The 2019 Bhutan STEPS Survey found that 6.6% of adults reported respiratory symptoms, with 8.7% of adults exposed to indoor smoke due to traditional cooking practices.[2] Tobacco use remains a significant health risk, despite Bhutan being the first country to impose a nationwide ban on tobacco sales.

Bhutan has successfully mainstreamed NCD services, including CRD management, into its primary health care (PHC) system. The country follows the WHO PEN protocol, enabling early detection, standardized treatment and long-term follow-up of patients with asthma and COPD. Health assistants and primary care providers have been trained to identify and manage CRDs at the community level using WHO PEN protocols and inhaled medications are made available. The Health Information Management System (HIMS) tracks chronic NCD patients, including those with CRDs, enhancing continuity of care.

The country enforces the Tobacco Control Act (2010) and adheres to the WHO FCTC guidelines. Community engagement in reducing indoor air pollution through clean cooking initiatives (e.g. subsidized liquefied petroleum gas) has also contributed to CRD prevention. Bhutan was recognized for its high performance in tobacco control policy implementation. Public awareness campaigns are routinely conducted by village health workers (VHWs) and district health officers.

The Health Promotion Division works with district health offices to promote respiratory health through:

- school-based health education on the dangers of tobacco and air pollution;
- routine screening for respiratory symptoms during community health visits; and
- integration of CRD messaging into the community action for health model, which supports local ownership of health issues.

Outcomes

- CRD-related outpatient visits have declined in major districts; this is attributed to early identification and better disease management.
- In selected pilot districts, improved asthma control has reportedly led to reductions in emergency visits and exacerbation episodes.[3]
- Awareness of key respiratory symptoms, such as persistent cough, has increased through community-based health actions.

Lessons learnt

Bhutan demonstrates that integrating CRD management into existing PHC and NCD platforms is effective, even in resource-limited settings. Community health workers can play a crucial role in early detection, patient education and adherence support. Multisectoral collaboration, especially in tobacco control and clean energy, significantly enhances CRD prevention.

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3.2.5 Health information system for CRDs

The inclusion and integration of key facility-based indicators for CRDs into routine health reporting systems is essential for tracking national progress, identifying service delivery gaps and providing valuable insights to guide future actions.

The successful tracking of core indicators for hypertension and diabetes has demonstrated to countries the potential of having key performance indicators for NCDs to improve the delivery of services at the primary health care level *(62)*.

WHO Noncommunicable disease facility-based monitoring guidance provides a set of core and optional indicators that can be used to track CRD management and service delivery at the facility level. The *Guidance* includes standard definitions, metadata, data sources, recommended reporting frequency and known limitations for each indicator *(63)*.

The four core indicators identified for CRDs are:

- asthma control;
- COPD control;
- availability of essential asthma medicines; and
- availability of essential COPD medicines.

In addition, 11 optional indicators are provided, including treatment coverage among people with asthma and treatment coverage among people with COPD.

Countries across the Region are at different stages of implementing effective NCD interventions, as outlined in WHO PEN. Some are in early or pilot phases while others have scaled interventions nationally and incorporated elements of the technical package into national guidelines.

Despite these tools, most countries in the WHO SE Asia Region are yet to systematically integrate CRD indicators into national health information systems. Where data exist, these are often limited to patient counts and are variably reported, lacking disaggregation by sex, age or service level. Even this information is often incomplete and inconsistently reported, and lacks standardization. Building on regional successes, such as the SEAHEARTS initiative, focused on hypertension and diabetes, countries should expand their digital NCD dashboards to include CRD indicators, ensure alignment with WHO PEN implementation and embed data use in quality improvement cycles at facility and district levels.

Countries could explore integration of CRD indicators into existing digital platforms, such as District Health Information Software 2 (DHIS2), ensuring interoperability and real-time reporting to strengthen monitoring and decision-making.

3.2.6 Coverage of CRD services in benefit packages (CRDs need to be covered in benefit packages)

The NCD benefit package in the WHO SE Asia Region has been progressively expanded and integrated into primary health care through the adoption of people-centred approaches. A central component of this effort has been the implementation of WHO PEN, which provides cost-effective clinical services for hypertension, diabetes and cervical cancer, among other diseases. These services include screening, behavioural counselling, drug therapy and referral mechanisms. Countries in the Region have contextualized and scaled up PEN interventions, complemented by national guidelines, multisectoral action plans and training modules for primary care workers.

The countries in the Region have diverse approaches to integrating CRD services into their health benefit packages. Bangladesh has established NCD corners at the *upazila*/subdistrict level within its primary health care system. The integration of CRD services into benefit packages is still evolving. Bhutan has implemented the WHO PEN and HEARTS technical packages, which include CRD management at primary health care facilities, enhancing service coverage.

In India, the National Programme for Prevention and Control of Noncommunicable Diseases (NP-NCD) includes CRD services at various levels of health care. The Ayushman Bharat Pradhan Mantri Jan Arogya Yojana offers insurance packages for several NCDs, including CRDs, but the coverage is inconsistent across states and primarily focused on treatment during hospitalization *(64)*. Indonesia's Jaminan Kesehatan Nasional (JKN) covers a broad range of services, including CRDs *(65)*.

In Maldives, basic CRD services are available but need expansion, particularly to address the growing demand. Myanmar has adopted the WHO PEN interventions, including CRD management. Nepal's health system offers CRD services, especially in urban regions, but rural areas face gaps in diagnostic tools and personnel. Sri Lanka provides services for CRDs through its public health system, although urban–rural disparities exist in access to care.

Thailand's Universal Health Coverage (UHC) scheme includes CRD services with a focus on prevention and management, although quality and accessibility vary across regions *(66)*. Timor-Leste, in the early stages of integrating CRD services, requires significant investment in infrastructure and training to manage these diseases effectively.

While progress has been made in integrating CRD services into national health benefit packages in the Region, ongoing efforts are needed to address gaps in resources, infrastructure and training, particularly in rural areas *(67)*.

A notable example of the inclusion of CRD services in benefit packages is the implementation of WHO's Practical Approach to Lung Health (PAL) strategy in Kerala, India. Kerala, with its relatively strong primary health care system, piloted the PAL strategy to improve the quality of diagnosis and management of common respiratory illnesses, such as asthma and COPD, within primary health centres *(68)*. By integrating PAL into the public health system and standardizing care through clinical guidelines and managerial support, the Indian state ensured that essential CRD services were accessible, publicly financed and systematically delivered *(69)*.

Integrating essential chronic respiratory disease services into UHC at Public Health Centers in Indonesia

Exposure to smoke from cooking with solid fuels in densely populated urban settlements increases the risk of chronic respiratory diseases and worsens air quality

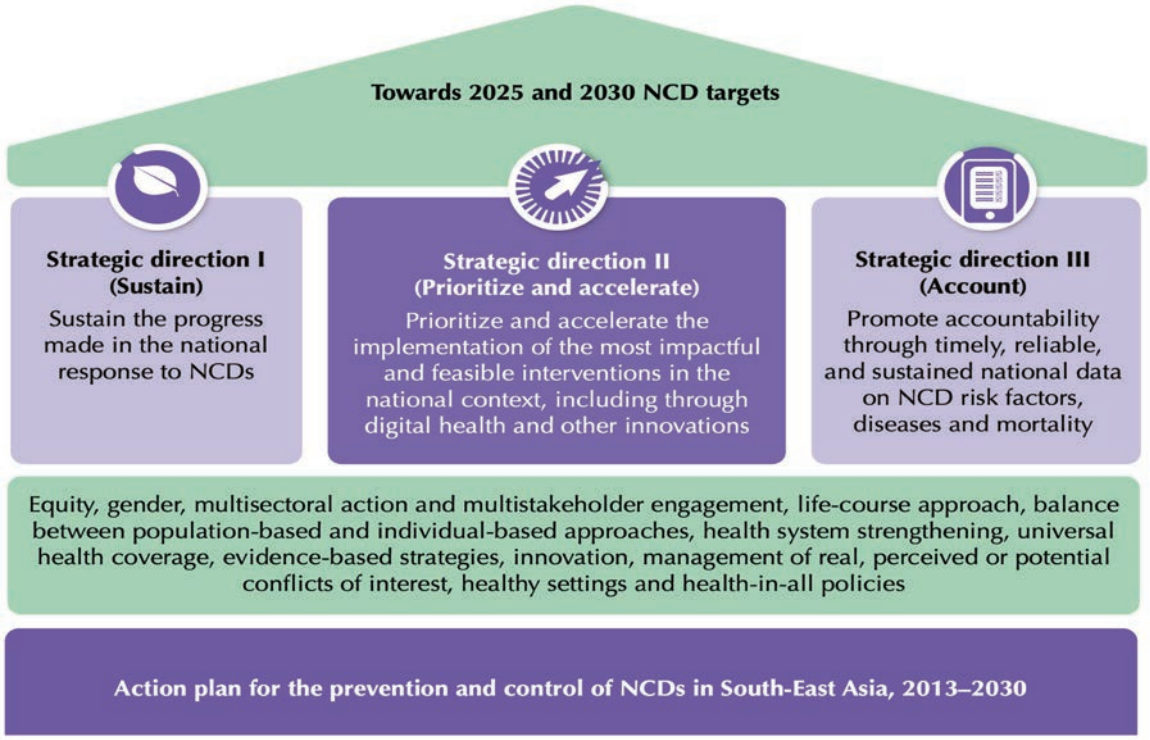
Training & Task-shifting for stronger primary care in chronic respiratory disease prevention and management

Proposed actionable solutions to strengthen CRD prevention and management in the WHO SE Asia Region

The review indicates that the burden of CRDs and risk factors remains high in the Region. Though countries have taken steps towards prevention and management of CRDs, the progress in this regard has been slow and uneven, with substantial gaps in policy implementation and health care scale-up. The specific epidemiological, environmental and diagnostic challenges posed by CRDs in the Region demand actionable solutions, aligned with the technical guidance provided in the WHO technical packages.

The Action Plan for the Prevention and Control of NCDs in South-East Asia, 2013–2030, along with the Implementation Roadmap for Accelerating the NCD Prevention and Control in South-East Asia, 2022–2030, provides the strategic directions for implementing cost-effective interventions in the national context for the control of risk factors and management of NCDs, including CRDs, within primary health care settings (Fig. 12) *(59)*.

Fig. 12. Implementation Roadmap for Accelerating the NCD Prevention and Control in South-East Asia, 2022–2030



Based on the review findings, solutions can be grouped into the following priority domains:

1 Reducing risk factors

To prevent the onset of CRDs, it is important to continue implementing evidence-based technical packages.

(A) Air quality improvement and occupational exposure reduction:

- Implement comprehensive air quality improvement initiatives, including stricter regulations on air pollution from industrial, transport and household sources.
- Align the national ambient air quality standards for $PM_{2.5}$ and PM_{10} with WHO global air quality guidelines, while setting realistic interim targets for gradual compliance.
- Promote cleaner energy solutions (both at home and workplace) and strengthen air pollution monitoring systems through subsidies and awareness campaigns, particularly in countries/areas with high biomass fuel reliance.
- Promote the use of personal protective equipment in workplace for those engaged in occupations associated with significant air pollution.
- Promote the adoption of low-emission and electric vehicles, expand public transport infrastructure, and introduce congestion and pollution pricing in areas to reduce ambient air pollution.
- Strengthen and enforce public policies, laws, regulations and other measures to address the drivers of household air pollution (particularly from the use of solid fuels) and occupational lung diseases. Ensure the implementation of Clean Household Energy Solutions Toolkit (CHEST) measures in the national context.
- Encourage the rapid transition to clean cooking technologies (e.g. LPG, biogas) in biomass-dependent households, complemented by supportive financing and community-level education.

(B) Strengthening tobacco control:

- Fully implement WHO FCTC protocols to reinforce tobacco control policies, including increasing taxes on tobacco products, implementing smoking bans, and reducing exposure to second-hand smoke in both public and private spaces.
- Regulate electronic nicotine delivery systems (ENDS), given their high and rising prevalence in several SE Asia Region countries.
- Expand cessation services at the PHC level and integrate behavioural and pharmacological support, supported by new technology, and mobile and app-based platforms, such as the WHO Quit Tobacco app.
- Incorporate school-based and youth-targeted prevention programmes to prevent early initiation of smoking and address e-cigarette use.

(C) Cross-cutting multisectoral engagement and advocacy:

- Leverage the advocacy and coordination mechanism established under the national multisectoral action plan for a whole-of-government, whole-of-society approach to mitigate the risk factors contributing to CRDs in the national context.

- Adopt a life-course approach and actively engage people living with CRDs. Interventions should begin early, targeting key stages of lung growth and development, including during pregnancy, early childhood and adolescence.
- Empower civil society and patient groups to drive accountability, ensure service equity, and support community-based education and advocacy efforts.

2 Strengthening health systems response for management of CRDs

(A) UHC-based integration of essential CRD services:

- Define and integrate a minimum package of CRD services: diagnosis, treatment, counselling, referral and rehabilitation within UHC benefit packages.
- Ensure costing and budget allocation to support sustainable financing for CRD services.
- Prioritize underserved regions and population groups through equity-focused rollout.

(B) Preventive measures in primary health care:

- Provide services for smoking cessation support through a combination of digital tools such as 'WHO Quit Tobacco App', motivational interviewing techniques and pharmacological aids.
- Conduct awareness campaigns regarding adverse health effects of air pollution and take steps to mitigate them (especially at home and workplace).
- Improve access to preventive measures, including vaccination and nutritional support.
- Provide educational tools and materials for patients and their families to minimize exposure to risk factors, promote appropriate use of medications and dispel common myths, particularly around inhaler usage.
- Educate the public, especially children and youths, about the harmful health effects of tobacco smoking.
- Promote community-level pulmonary rehabilitation activities and culturally adapted self-management support, including home-based breathing exercises and group sessions.

(C) Availability and accessibility of quality essential medicines and technologies:

- Improve the availability of peak flow meters in primary care. Depending on available resources, efforts should be made to improve access to spirometers at primary health care centres. Regular supply of essential consumables, such as mouthpiece and calibration tools, is important for diagnoses and management.
- Countries should explore newer technologies, such as ultrasonic spirometers, that are less dependent on skilled health personnel.
- Include inhaled and nebulized medications for asthma and COPD in the National Essential Medicines List. The core medicines include the most efficacious, safe, low-cost drugs selected on the basis of current evidence-based guidelines.
- Promote the use of portable spirometers at primary and secondary care levels, especially in remote or underserved areas, where access to standard spirometry is limited. Portable devices offer the advantage of mobility and ease of use, and can support earlier and more widespread diagnosis of obstructive airway diseases.

- Strengthen procurement, supply and distribution systems with a focus on primary health care to ensure the availability and accessibility of medicines and diagnostics. The primary health care essential service package needs to incorporate pulse oximeters and nebulizers.
- Wherever feasible, try and periodically upgrade to updated standard-of-care algorithms suggested by international professional bodies.

3 Reorient delivery of health services for prevention and management of CRDs

(A) Primary care level:

- Establish clear pathways for CRDs within the broader NCD framework.
- Promote the use of validated, questionnaire-based tools to identify high-risk individuals and prioritize them for screening and diagnosis, and ensure that medicines and diagnostics devices are available as per national protocols.
- Deploy portable spirometry at the primary care level to support early diagnosis and ongoing monitoring of asthma and COPD. This should be complemented by appropriate training for health workers and the use of standardized protocols to ensure accurate interpretation of and integration into patient care.
- Train and task-shift health workers to perform key primary health care functions related to CRD prevention and management.
- Implement standardized, simplified, drug- and dose-specific protocols for the management of asthma and COPD at the primary health care level, including differential diagnosis of symptoms such as cough, breathlessness, wheeze and chest tightness in both adults and children.
- Incorporate asthma management as a core component of the national Integrated Management of Childhood Illness (IMCI) strategy.
- Train community health workers to support home-based care, reinforce adherence and provide ongoing education.

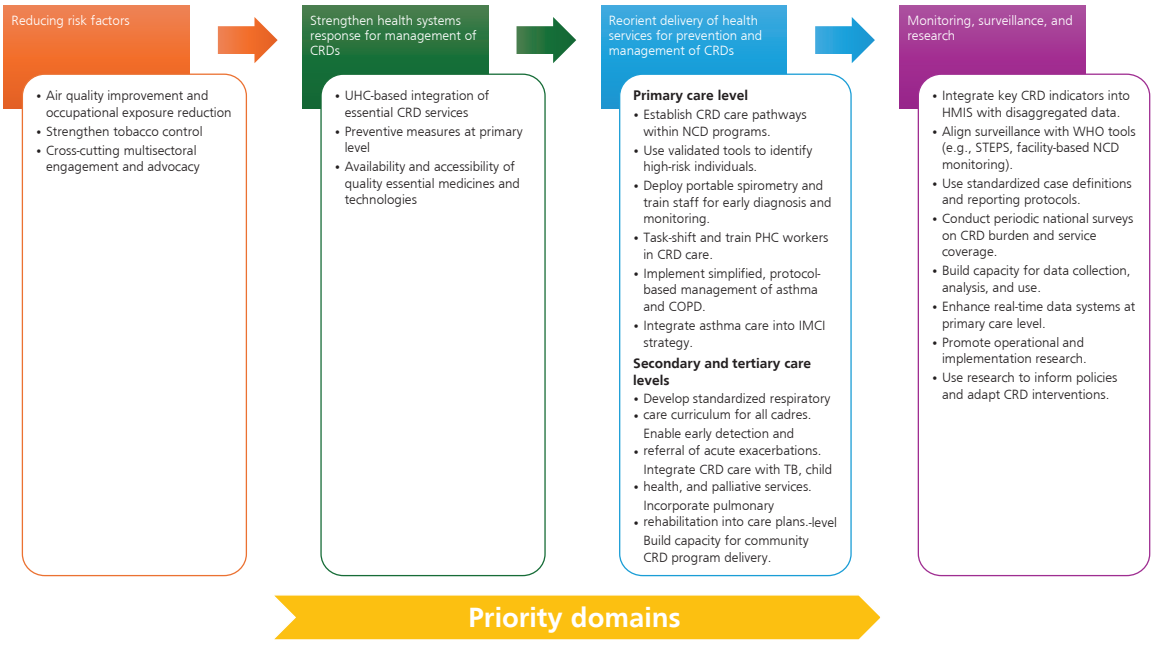
(B) Secondary and tertiary care level:

- Develop and implement a standardized respiratory care curriculum for multiple health professionals, including nurses, physiotherapists, and both generalist and specialist doctors, and build the capacity of health workforce.
- Ensure early detection of acute exacerbations, with scaling up of treatment using rescue medications, and, if needed, prompt referrals to the next level of care for those at risk of respiratory failure.
- Facilitate convergence between NCD programmes and other health programmes (e.g. tuberculosis, child and adolescent health) for integrated prevention and care.
- Integrate CRD management with palliative care programmes, ensuring access to symptom relief, psychosocial support and advanced care planning for patients with severe disease.
- Incorporate pulmonary rehabilitation into CRD management, with care plans that address physical and functional needs to improve quality of life and reduce exacerbations.
- Ensure capacity-building and orientation of all health-care personnel on programmatic delivery of CRD care in the community.

4 Invest in monitoring, surveillance and research

- Integrate key CRD indicators (e.g. prevalence, hospitalizations, medication use and outcomes) into national health management information systems, ensuring disaggregation by age, sex, location and socioeconomic status.
- Align data collection methods with WHO-recommended tools (such as the WHO STEPwise approach to surveillance and facility-based NCD monitoring) to ensure comparability across countries and over time.
- Use standardized case definitions and reporting protocols for asthma, COPD and other CRDs across all levels of care.
- Conduct periodic, nationally representative surveys on CRD risk factors, prevalence and service coverage, including integration into demographic and health surveys and national NCD risk factor surveys.
- Build capacity of health personnel at national and subnational levels to collect, analyse and use CRD-related data for programme improvement.
- Improve real-time data flow from primary care facilities through digital platforms that support early detection, case-tracking and programme evaluation.
- Support operational and implementation research to identify context-specific barriers and solutions to the scale-up of CRD services.
- Use research findings to inform policy decisions and to adapt and refine CRD interventions in real-world settings.
- Establish or strengthen national COPD and asthma registries to guide evidence-based policies and monitor long-term outcomes, as per resource availability.

Fig. 13. Prevention and management of chronic respiratory diseases through primary health care



Standardized treatment pathways, accurate diagnosis, and sustained long-term care- essential pillars of primary health care for chronic respiratory diseases

24/7 availability and accessibility of quality of medicines (oral and inhalers) is essential for management of chronic respiratory diseases

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Country profiles

The information presented in the profiles is based on the latest available data from the WHO NCD Data Portal. As NCD data are updated periodically, readers are encouraged to consult the portal for the most recent statistics and country-specific updates (Access the portal here: https://ncdportal.org).

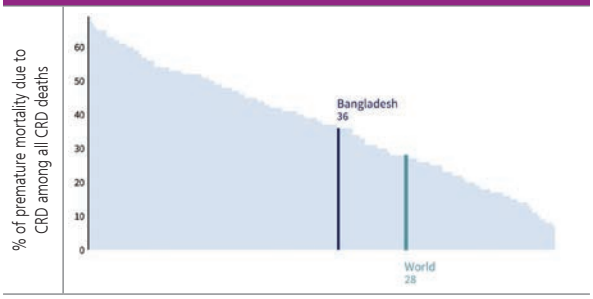
Bangladesh

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
173 562	579 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	34 359	30 443	64 802
Age-standardized death rate for chronic respiratory diseases (per 100 000)	69	50	59
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	12.6

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	1.71%	1.88%	1.80%	2.35%	2.68%	2.52%
Total number of deaths	4 144	5 633	9 777	28 176	23 055	51 231
Total DALYs (in number)	212 333	233 453	445 786	1 003 112	710 601	1 713 713

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	33%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	5%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	9 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	75%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	No
General availability of spirometry at the primary health care level	No
Medicines****	
General availability of steroid inhalers in the public health sector	No
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	No

*Indicates whether or not the country has an operational policy, strategy or action plan for chronic respiratory diseases (CRDs). This could be either a CRD-specific policy, strategy or action plan or the inclusion of CRDs in an integrated NCD policy, strategy or action plan.
**Indicates whether or not the country has evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases through a primary care approach recognized/approved by government or competent authorities.
***Indicates whether or not the country has reported that basic technologies (peak flow measurement, spirometry) for CRDs are generally available in 50% or more facilities at primary health care level, either in the private or public sector or both.
****Indicates whether or not the country has reported that medicines (steroid inhalers, combination budesonide-formoterol inhalers, bronchodilator inhalers) for CRDs are generally available in 50% or more pharmacies at primary health care facilities in the public health sector.

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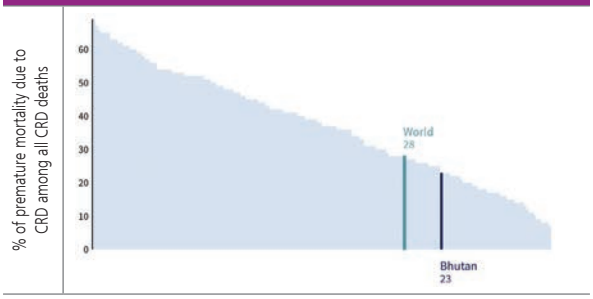
Bhutan

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
792	2710

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	215	234	449
Age-standardized death rate for chronic respiratory diseases (per 100 000)	77	81	79
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	16.6

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	1.27%	1.87%	1.56%	2·05%	2.60%	2.32%
Total number of deaths	22	35	57	183	188	371
Total DALYs (in number)	794	1189	1983	4859	4712	9571

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	19%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	12%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	5 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	20%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	No
General availability of spirometry at the primary health care level	No
Medicines****	
General availability of steroid inhalers in the public health sector	Yes
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	Yes

*Indicates whether or not the country has an operational policy, strategy or action plan for chronic respiratory diseases (CRDs). This could be either a CRD-specific policy, strategy or action plan or the inclusion of CRDs in an integrated NCD policy, strategy or action plan.
**Indicates whether or not the country has evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases through a primary care approach recognized/approved by government or competent authorities.
***Indicates whether or not the country has reported that basic technologies (peak flow measurement, spirometry) for CRDs are generally available in 50% or more facilities at primary health care level, either in the private or public sector or both.
****Indicates whether or not the country has reported that medicines (steroid inhalers, combination budesonide-formoterol inhalers, bronchodilator inhalers) for CRDs are generally available in 50% or more pharmacies at primary health care facilities in the public health sector.

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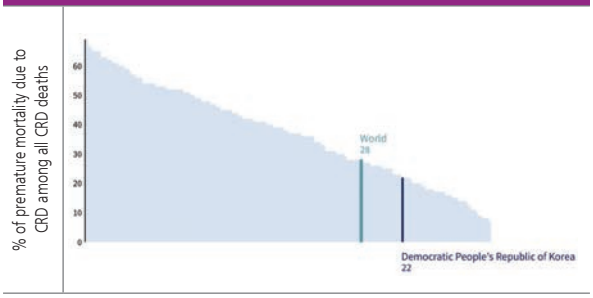
DPR Korea

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
26 499	210 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	15 076	17 206	32 282
Age-standardized death rate for chronic respiratory diseases (per 100 000)	119	78	95
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	15.5

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	4.10%	4.35%	4.23%	3.11%	3.83%	3.48%
Total number of deaths	602	804	1406	14 243	16 275	30 518
Total DALYs (in number)	35 589	38 238	78 827	287 309	315 437	602 746

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	17%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	11%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	8 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	89%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	No
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	Yes
General availability of spirometry at the primary health care level	No
Medicines****	
General availability of steroid inhalers in the public health sector	Yes
General availability of combination budesonide-formoterol inhalers in the public health sector	Yes
General availability of bronchodilator inhalers in the public health sector	Yes

*Indicates whether or not the country has an operational policy, strategy or action plan for chronic respiratory diseases (CRDs). This could be either a CRD-specific policy, strategy or action plan or the inclusion of CRDs in an integrated NCD policy, strategy or action plan.
**Indicates whether or not the country has evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases through a primary care approach recognized/approved by government or competent authorities.
***Indicates whether or not the country has reported that basic technologies (peak flow measurement, spirometry) for CRDs are generally available in 50% or more facilities at primary health care level, either in the private or public sector or both.
****Indicates whether or not the country has reported that medicines (steroid inhalers, combination budesonide-formoterol inhalers, bronchodilator inhalers) for CRDs are generally available in 50% or more pharmacies at primary health care facilities in the public health sector.

References

1. United Nations Department of Economic and Social Affairs. World Population Prospects 2024: Revision. United Nations, 2024 (https://population.un.org/wpp/)
2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates)
3. Institute for Health Metrics and Evaluation (2024). Global Burden of Disease Study 2021 (GBD 2021) data resources. Seattle, WA: IHME. 2024 (https://www.healthdata.org/results/data-visualizations)
4. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (https://ncdportal.org/)
5. World Health Organization (2025). Assessing national capacity for the prevention and control of noncommunicable diseases: report of the 2023 country capacity survey in the WHO South-East Asia Region. Geneva: World Health Organization (https://iris.who.int/handle/10665/381772)

India

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
1 450 936	6 400 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	587 407	672 349	1 259 756
Age-standardized death rate for chronic respiratory diseases (per 100 000)	138	115	126
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	20.5

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	2.39%	2%–23%	2.31%	2.31%	2.86%	2.58%
Total number of deaths	74 872	124 805	199 677	482 793	513 568	996 361
Total DALYs (in number)	2 793 112	3 245 539	6 038 651	13 247 349	10 771 031	24 018 380

Percentage of CRD deaths occurring under 70 years[4]

Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	24%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	7%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	9 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	32%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	Yes
General availability of spirometry at the primary health care level	Yes
Medicines****	
General availability of steroid inhalers in the public health sector	No
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	Yes

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References

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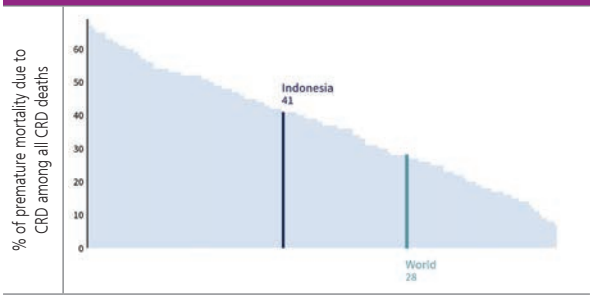
Indonesia

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
283 488	1 380 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	60 041	46 712	106 753
Age-standardized death rate for chronic respiratory diseases (per 100 000)	138	115	126
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	8.2

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	2.75%	1.94%	2.35%	1.93%	1.84%	1.88%
Total number of deaths	11 271	13 752	25 023	47 921	31 491	79 412
Total DALYs (in number)	568 879	498 538	1 067 417	1 479 011	756 803	2 235 814

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	38%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	11%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	4 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	16%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	No
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	No
General availability of spirometry at the primary health care level	No
Medicines****	
General availability of steroid inhalers in the public health sector	Yes
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	Yes

*Indicates whether or not the country has an operational policy, strategy or action plan for chronic respiratory diseases (CRDs). This could be either a CRD-specific policy, strategy or action plan or the inclusion of CRDs in an integrated NCD policy, strategy or action plan.
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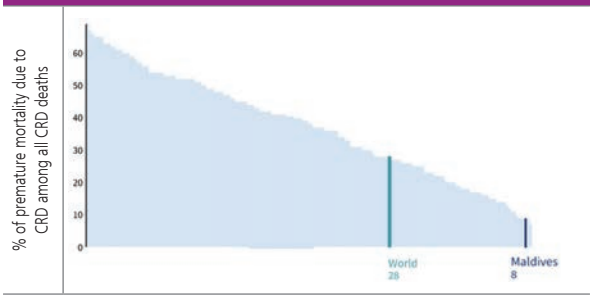
Maldives

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
528	2170

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	143	125	268
Age-standardized death rate for chronic respiratory diseases (per 100 000)	119	114	117
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	12.3

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	1.48%	1.68%	1.56%	1.48%	1.92%	1.65%
Total number of deaths	15	11	26	116	106	222
Total DALYs (in number)	341	266	607	1119	1007	2126

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	26%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	17%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	3 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	1%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	No
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	Yes
General availability of spirometry at the primary health care level	Yes
Medicines****	
General availability of steroid inhalers in the public health sector	Yes
General availability of combination budesonide-formoterol inhalers in the public health sector	Yes
General availability of bronchodilator inhalers in the public health sector	Yes

*Indicates whether or not the country has an operational policy, strategy or action plan for chronic respiratory diseases (CRDs). This could be either a CRD-specific policy, strategy or action plan or the inclusion of CRDs in an integrated NCD policy, strategy or action plan.
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****Indicates whether or not the country has reported that medicines (steroid inhalers, combination budesonide-formoterol inhalers, bronchodilator inhalers) for CRDs are generally available in 50% or more pharmacies at primary health care facilities in the public health sector.

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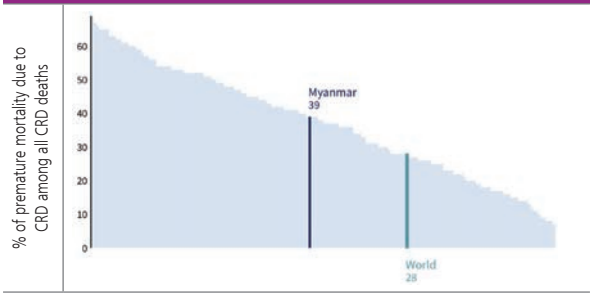
Myanmar

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
54 500	277 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	20 467	18 697	39 164
Age-standardized death rate for chronic respiratory diseases (per 100 000)	119	114	117
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	14.3

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	2.15%	1.46%	1.79%	2.32%	2.39%	2.36%
Total number of deaths	3752	4767	8519	16 421	13 415	29 836
Total DALYs (in number)	151 648	169 443	321 091	494 209	366 006	860 215

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	44%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	7%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	5 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	69%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	No
General availability of spirometry at the primary health care level	No
Medicines****	
General availability of steroid inhalers in the public health sector	Yes
General availability of combination budesonide-formoterol inhalers in the public health sector	Yes
General availability of bronchodilator inhalers in the public health sector	Yes

*Indicates whether or not the country has an operational policy, strategy or action plan for chronic respiratory diseases (CRDs). This could be either a CRD-specific policy, strategy or action plan or the inclusion of CRDs in an integrated NCD policy, strategy or action plan.
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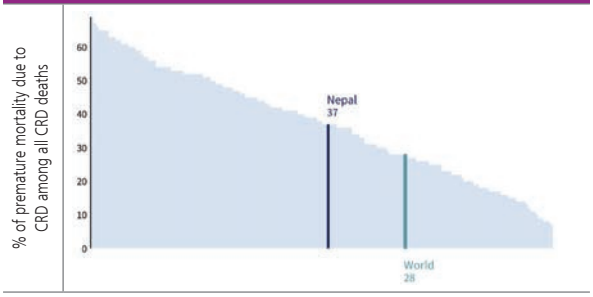
Nepal

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
29 651	110 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	11 557	15 648	27 205
Age-standardized death rate for chronic respiratory diseases (per 100 000)	144	140	142
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	9.4

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	1.61%	1.62%	1.61%	2.25%	2.47%	2.36%
Total number of deaths	1483	2711	4194	9487	12 199	21 686
Total DALYs (in number)	62 789	83 972	146 761	311 190	299 403	610 593

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	28%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	7%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	7 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	65%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	No
General availability of spirometry at the primary health care level	No
Medicines****	
General availability of steroid inhalers in the public health sector	No
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	No

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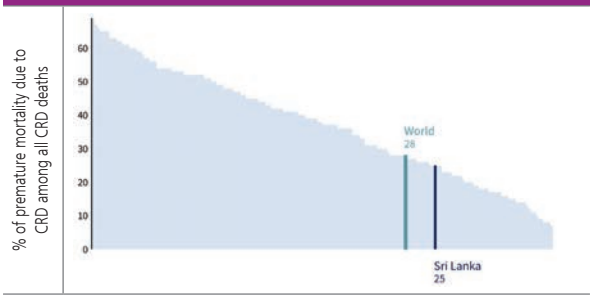
Sri Lanka

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
23 104	111 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	6533	5961	12 494
Age-standardized death rate for chronic respiratory diseases (per 100 000)	68	38	50
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	11.1

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	3.88%	3.64%	3.75%	2.52%	2.11%	2.30%
Total number of deaths	886	997	1883	5357	4649	10 006
Total DALYs (in number)	36 836	36 100	72 936	130 271	88 986	219 257

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	20%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	11%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	5 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	68%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	Yes
General availability of spirometry at the primary health care level	No
Medicines****	
General availability of steroid inhalers in the public health sector	Yes
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	Yes

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4. World Health Organization (2024). Noncommunicable Disease data portal. Geneva: World Health Organization; 2024 (https://ncdportal.org/)
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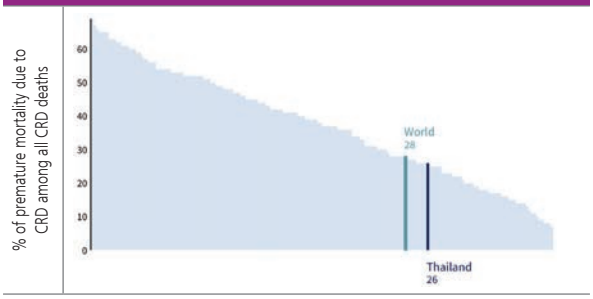
Thailand

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
71 668	430 000

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	14 851	8386	23 237
Age-standardized death rate for chronic respiratory diseases (per 100 000)	33	11	21
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	5.7

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	3.26%	2.85%	3.04%	3.43%	2.11%	2.74%
Total number of deaths	2283	1951	4234	12 277	6201	18 478
Total DALYs (in number)	93 771	71 153	164 924	345 111	142 554	487 665

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	19%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	15%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	5 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	16%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	Yes
General availability of spirometry at the primary health care level	Yes
Medicines****	
General availability of steroid inhalers in the public health sector	No
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	Yes

*Indicates whether or not the country has an operational policy, strategy or action plan for chronic respiratory diseases (CRDs). This could be either a CRD-specific policy, strategy or action plan or the inclusion of CRDs in an integrated NCD policy, strategy or action plan.
**Indicates whether or not the country has evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases through a primary care approach recognized/approved by government or competent authorities.
***Indicates whether or not the country has reported that basic technologies (peak flow measurement, spirometry) for CRDs are generally available in 50% or more facilities at primary health care level, either in the private or public sector or both.
****Indicates whether or not the country has reported that medicines (steroid inhalers, combination budesonide-formoterol inhalers, bronchodilator inhalers) for CRDs are generally available in 50% or more pharmacies at primary health care facilities in the public health sector.

References

1. United Nations Department of Economic and Social Affairs. World Population Prospects 2024: Revision. United Nations, 2024 (https://population.un.org/wpp/)
2. World Health Organization (2021). Global Health Estimates 2021: deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization; 2021 (https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates)
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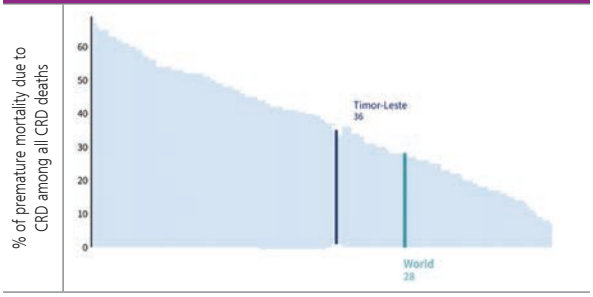
Timor-Leste

Total population (000s)[1]	Total number of deaths due to all NCDs[2]
1 401	4770

Chronic respiratory diseases mortality (2021)[2]	Male	Female	Both sexes
Number of deaths due to chronic respiratory diseases	247	198	445
Age-standardized death rate for chronic respiratory diseases (per 100 000)	67	44	55
Deaths (30–69-year-old) due to chronic respiratory diseases as a proportion of all NCD deaths (%)	–	–	9.2

Disease burden of asthma, chronic obstructive pulmonary diseases (2021)[3]	Asthma			Chronic obstructive pulmonary diseases		
	Male	Female	Both sexes	Male	Female	Both sexes
Prevalence (%)	3.27%	2.95%	3.11%	1.55%	1.36%	1.45%
Total number of deaths	53	59	112	188	132	320
Total DALYs (in number)	2708	2635	5343	5240	3220	8460

Percentage of CRD deaths occurring under 70 years[4]



Illustrating premature deaths (under 70 years) due to chronic respiratory diseases as a proportion of all chronic respiratory disease deaths, compared with global status.

Risk factors for chronic respiratory diseases[4]	Burden level
Percentage of the population aged 15 years and over who currently use any tobacco product (smoked and/or smokeless tobacco) on a daily or non-daily basis (both sexes, 2022)	39%
Percentage of adults aged 18+ years with a body mass index (BMI) of 30 kg/m^2 or higher (both sexes,2022)	2%
Exceedance of the WHO guideline level for annual mean concentration of particles of ≤2.5 micrometres in the air (by a multiple of)	5 times above permissible level
Percentage of the population that relies on polluting fuels and technologies as the primary source of domestic energy for cooking	86%

National Response (2023)[5]	Yes/No/Don't know
Policies*	
Existence of operational policy/strategy/action plan for chronic respiratory diseases	Yes
Clinical management guidelines**	
Existence of evidence-based national guidelines/protocols/standards for the management of chronic respiratory diseases	Yes
Basic technologies***	
General availability of peak flow measurement spirometry at the primary health care level	Yes
General availability of spirometry at the primary health care level	Yes
Medicines****	
General availability of steroid inhalers in the public health sector	Yes
General availability of combination budesonide-formoterol inhalers in the public health sector	No
General availability of bronchodilator inhalers in the public health sector	Yes

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References

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South-East Asia Region