

Review Article

Addressing the global challenges of COPD and Asthma: A shared vision from the Global Initiative for Chronic Obstructive Pulmonary Disease and the Global Initiative for Asthma

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Global Initiative for Chronic Obstructive Lung Disease (GOLD) and Global Initiative for Asthma (GINA) have a shared purpose in working to improve outcomes for patients with chronic obstructive pulmonary disease (COPD) and asthma. This joint statement is dedicated to Professor Eric Bateman, an inaugural member of the GINA Science Committee and member of the GINA Board, and to Professor Robert Rodriguez-Roisin, a founder and chair of the GOLD board of directors, both recently deceased. Both made invaluable contributions to asthma and COPD research and took a global perspective on the challenges of diagnosis and management. It was partly Professor Bateman's idea that GOLD and GINA should produce a joint statement addressing the similar challenges faced in the prevention, early and accurate diagnosis, and management of both COPD and asthma, emphasizing the determination of both organizations to work together to address these issues.

Keywords: Asthma, COPD, GOLD, GINA, Global challenges

INTRODUCTION

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) and Global Initiative for Asthma (GINA) have produced strategy reports and recommendations about diagnosis and management for these two most common lung diseases every year for the past 25 years. Approximately 650 million children and adults have chronic obstructive pulmonary disease (COPD) or asthma, and their prevalence is forecast to more than double by 2050. In 2021, over 4 million people died from these diseases^[1,2] and COPD currently is the third most common cause of death worldwide. Asthma is the most common chronic disease in children under 15^[3] and 1 in

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3 children with asthma miss days from school.^[4] The health and economic costs caused by COPD and asthma are high and rising. For example, the global direct costs from COPD in 2025 were estimated to be \$3.89 trillion and are projected to rise to \$24.35 trillion by 2050.^[5]

From a global perspective, non-communicable diseases (NCDs) have, for many years, been overshadowed by infectious (communicable) diseases. In low- and middle-income countries (LMIC), the growing prevalence of asthma and mortality rates globally remain unacceptably high,^[6] with 96% of asthma deaths occurring in these countries.^[7] The morbidity and mortality caused by COPD in both high-income countries (HIC) and LMIC remain largely unrecognized.^[8] Unlike other NCDs such as ischemic heart disease and diabetes, asthma and COPD have not been prioritized by policymakers, resulting in inadequate access to diagnostic tools and treatments. Below, we discuss challenges with their diagnosis and treatment, as well as the potential impact of climate change on these patients [Figure 1].

CHALLENGES WITH DIAGNOSIS

Making a diagnosis of asthma depends on recognizing the characteristic pattern of symptoms and identifying variable expiratory airflow using spirometry or peak expiratory flow measurements. The diagnosis of COPD is suspected on the basis of clinical features and exposure to risk factors, but also requires spirometry to confirm the presence of incompletely reversible airflow obstruction. Neither spirometry nor peak flow meters are widely available in LMIC.^[9] This is due to both shortage of equipment and a lack of trained individuals to perform and interpret the tests. Many hospitals do not have pulmonary function laboratories. For example, in

Nigeria, only one-third of respiratory specialists had the ability to perform basic spirometry, and none had the capacity to perform bronchial provocation testing.^[10] At a primary care level, the availability of spirometry in LMIC is essentially nonexistent. This is part of a more general problem of the availability of diagnostic tests. For example, in LMIC, the median availability of simple general medical diagnostic tests was 19.1% in basic primary care facilities.^[11] Confirming a diagnosis of asthma or COPD may depend on referral to specialists, but their availability is low, and the cost of travelling to see them is often prohibitive.^[12]

There have been initiatives to improve access to diagnostics in LMIC, particularly following the COVID pandemic, but these have not addressed issues such as the availability of spirometry.^[13] There are competing demands on healthcare budgets, which means that the provision of respiratory diagnostic equipment has not been seen as a priority. GOLD and GINA will continue to work together to improve access to diagnostic tests and support educational initiatives such as the Pan African Thoracic Society's foundational spirometry training program^[9] to train clinicians in their correct performance and interpretation.

Even in HIC, there are problems with the diagnosis, particularly in COPD. COPD has been traditionally considered a self-inflicted disease caused by tobacco smoking and occurring in older males. This is an incomplete view of COPD. We now know that other risk factors beyond smoking can lead to COPD (including, among others, prematurity, low birth weight, repeated infections in infancy, and exposure to biomass and other in-house pollutants), that COPD can occur in young individuals and, of course, in females.^[14] However, these circumstances are often not considered, leading to huge underdiagnosis, misdiagnosis, and late diagnosis.

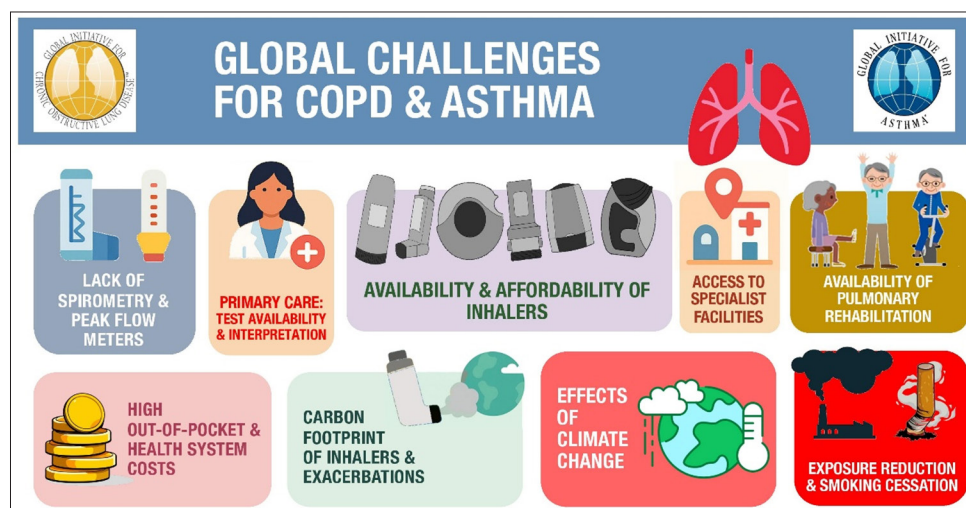


Figure 1: Global Challenges for Chronic Obstructive Pulmonary Disease and Asthma.

CHALLENGES WITH TREATMENT

Asthma and COPD are chronic diseases, but they are too often treated as recurrent acute events. The management strategies for both diseases now emphasize the importance of moving away from short-acting symptom-relieving treatments and from reliance on acute care for periodic symptom worsening, to long-term approaches which include pharmacological and non-pharmacological interventions. Although COPD and asthma are different diseases with important differences in their management strategies, inhaled therapies, although containing different combinations of drugs, are central to their treatment.^[14,15] Inhalers containing both formoterol (a rapid-onset long-acting bronchodilator) and an inhaled corticosteroids (ICS) are the recommended therapy for most patients with asthma, with evidence that their use as an anti-inflammatory reliever (AIR) in adults and adolescents with “mild” asthma reduces the risk of emergency visits and hospitalizations by two-thirds compared with a short-acting bronchodilator; the same medication (low-dose ICS-formoterol) can be used as maintenance-and-reliever therapy (“MART”).^[15] In settings where these medications are not available or affordable, the approach is the use of ICS whenever short-acting bronchodilators are taken.^[16] On the other hand, combinations of long-acting bronchodilators, with the addition in some patients of ICS (so-called triple therapy), together with non-pharmacological approaches including smoking cessation, and exercise/pulmonary rehabilitation, are the mainstay of COPD therapy.

The World Health Organization (WHO) Global Action Plan stipulates that medications on the essential medicine list which meet priority health needs for the population should be available in 80% of all health facilities and should cost less than a day’s wage for the lowest-paid government worker.^[17] The wide gaps in access to inhaled medicines for COPD and asthma are well documented. Even where inhaled therapies are available, individuals and families often suffer catastrophic health costs limiting access.^[12] These factors result in the majority of people living in LMIC being largely left behind and suffering significant morbidity and mortality from COPD and asthma.^[7] A systematic review of 60 LMIC found that essential asthma and COPD inhalers were largely unavailable in these countries.^[18] A subsequent cross-sectional survey of 60 LMIC found that only around one-third of health facilities stocked affordable ICS, and that combination inhaled therapies containing ICS-formoterol were both available and affordable in only 11% of pharmacies and 5% of healthcare facilities (HCFs) surveyed.^[19] In a Global Asthma Network study, lack of access to inhaled treatment was associated with severe asthma symptoms, with 60% of adolescents with severe symptoms lacking access to ICS treatment.^[20] Inhaled long-acting muscarinic antagonists, necessary to treat COPD, were available and affordable in

only 7% of pharmacies and 4% (2/56) of HCFs.^[19] Further, the latest WHO NCD Country Capacity Survey highlighted significant differences in inhaler access between income groups, with inhalers available in 26% of low-income countries and in 93% of HIC.^[21] These levels of availability and affordability are far below the 80% WHO Global NCD Action Plan target. GOLD and GINA are working together through the forum of international respiratory societies (FIRS) to try to close the wide access gaps to inhaled medicines for COPD and asthma.

CONSEQUENCES OF CLIMATE CHANGE AND AIR POLLUTION

In addition to the problems regarding access to diagnostic tests and inhaled therapies discussed above, patients with COPD and asthma now also face challenges related to climate change.^[22-24] Increases in the frequency, duration, and severity of periods with extreme temperature as well as secondary changes in the frequency and intensity of wildfires and dust storms and increases in the concentrations of allergens and pollutants in outdoor and indoor air, pose a growing risk to vulnerable populations such as children and the elderly as well as individuals with respiratory diseases.^[25,26] The health impacts of climate change are complex, but the consequences regarding asthma and COPD fall into two broad categories. Catastrophic weather events heighten patients’ stress levels, impact infrastructure, and disrupt care for people living with chronic conditions such as asthma and COPD.^[22,23] Second, increased levels of air pollution, enhanced survival of respiratory viruses, and increased concentrations of allergens like mold and pollen together with extreme temperatures and thunderstorms, may worsen morbidity and mortality and increase healthcare costs.^[22,23,27-29] The ecological impacts of climate change disproportionately affect people who already have fewer resources, increasing local, regional, and global inequalities.^[12] GOLD and GINA will continue to work together to highlight the impact of climate change on people with COPD and asthma and to propose strategies to minimize the effects. As discussed below, this must include addressing the carbon footprint of therapy.

CARBON FOOTPRINT OF ASTHMA AND COPD THERAPY

Pressurized metered dose inhalers (pMDIs) represent the majority of inhalers used globally to treat asthma and COPD. pMDIs release greenhouse gases (GHG) during use, and even after disposal, as the propellant continues to leak out when the inhaler is apparently “empty.”^[30] Management recommendations must take account of this impact, but alternative inhalers such as dry powder inhalers (DPI) and soft mist inhalers (SMI), which do not contain a propellant,

still have a carbon footprint related to pharmaceutical ingredient production, packaging, distribution, storage, and disposal. DPI and SMI use is very limited in LMIC and even in some HICs^[31] and ICS are not available in SMIs. In addition, for some populations such as children and the elderly, pMDIs with a spacer remain the most effective way to deliver therapy. Although the selection and correct use and disposal of inhalers by patients can have an impact on carbon footprint, the environmental impact of healthcare facilities must also be considered. It has been estimated that the highest contributor to annualized GHG emissions from COPD care in the UK was from the carbon footprint of inpatient care for exacerbations.^[32] In asthma, AIR therapy with ICS-formoterol in a DPI reduced severe exacerbations by 60% and reduced the carbon footprint by 96% compared with salbutamol pMDI.^[33] Using effective therapies that keep patients out of the hospital and prevent exacerbations can contribute to limiting the environmental impact of COPD and asthma, and this will be reflected in recommendations produced by GOLD and GINA.

In 2024, the European Union (EU) approved new rules to reduce emissions from fluorinated gases used in pMDIs to near zero by 2030^[34] and introduced a ban on export of

pMDIs from the EU to countries that have not ratified the Kigali amendment to the Montreal protocol on substances from 2028.^[24] pMDIs using new propellants such as HFC-152a or HFO-1234ze(E), which have much lower global warming potential, are being developed,^[35,36] but it is likely that the cost of inhalers containing these propellants will be significantly higher than current devices.^[24] GOLD and GINA must ensure that these initiatives aimed at “fighting climate change” do not prevent patients from receiving effective and affordable therapy.

ROLE OF MANAGEMENT RECOMMENDATIONS AND GUIDELINES

Effective management of COPD and asthma requires evidence-based guidelines that can be applied globally. The annual GOLD and GINA reports provide up-to-date management recommendations based on the latest scientific evidence, but both organizations recognize that many of the recommended investigations, treatments, and interventions are not available in most LMICs. A key role of GOLD and GINA is to provide evidence-based updates on how best to manage COPD and asthma and not to develop sub-optimal, second-best recommendations that reinforce disparities

Table 1: Global Challenges in COPD and Asthma: Contributing factors and potential solutions.

Challenge	Contributing factors	Potential solutions
Risk factors for developing airway disease	Urbanization	Public health interventions to mitigate urban exposures
	Rising prevalence of preterm and low birth weight	Improved prenatal and maternal care programs
	Childhood malnutrition	Implementation of child-focused nutrition initiatives
	Early-life respiratory infections	Expanded access to vaccines targeting respiratory pathogens
	Tobacco smoke exposure	Strengthened tobacco control policies; expansion of cessation programs
	Aging populations	Integrated chronic disease management strategies
Diagnosis	Ambient and household air pollution	Enactment and enforcement of clean air legislation; accelerated transition to clean energy sources
	Limited availability of spirometry equipment	Deployment of the Global Spirometry Toolkit (FIRS)
Medication	Insufficient awareness of asthma and COPD among healthcare workers	Expanded education and advocacy programs; implementation of the WHA resolution on integrated lung health
	High carbon footprint of inhalers	Transition to dry powder inhalers and pMDIs with low Global Warming Potential propellants; emphasis on exacerbation prevention
Organization of care	High out-of-pocket costs	Advocacy for national and international policy reforms (e.g., WHA resolution) to improve affordability
	Low awareness of COPD and asthma and insufficient resources devoted to diagnosis and management	Recognition of the burden of disease and government policy initiatives such as inclusion of COPD on the National Basic Public Health priority list in China.
Research priorities	Scarcity of epidemiologic and clinical data in LMICs	Capacity-strengthening initiatives and enhanced research funding for LMICs

COPD: Chronic Obstructive Pulmonary Disease, FIRS: Forum of International Respiratory Societies, LMICs: Low- and middle-income countries, pMDIs: Pressurized metered dose inhalers, WHA: World Health Assembly

between HIC and LMIC. Nevertheless, while we continue to advocate for access to appropriate medicines for all, health professionals in low-resource settings need guidance on how to diagnose and manage COPD and asthma with the resources available there at present, and the World Health Organization is well-placed to address this need. The WHO guidance on asthma and COPD is being updated, with a particular focus on integrating chronic respiratory disease prevention, diagnosis, and management into primary care. This guidance should sit alongside the GOLD and GINA recommendations while work continues to raise awareness of COPD and asthma and increase access to diagnostic tests and optimal therapy. GOLD and GINA have recently worked together through the FIRS to get global recognition of the lack of availability and affordability of inhaled therapies and political commitment to address this. Solutions to the challenges exist [Table 1]. GOLD and GINA will work to support and encourage initiatives to address the challenges directly and through organizations such as the WHO's global alliance against chronic respiratory diseases.

CONCLUSION

GOLD and GINA are committed to addressing the global diagnostic and management challenges of asthma and COPD, particularly overcoming the shared problem of limited access to diagnosis and effective and affordable inhaled therapies.

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