

World Lung Day 2022: Lung Health for All

Lung Health Fact Sheet

The COVID-19 pandemic has shown the vital importance of lung health. However, with the pandemic dominating the headlines, it is easy to overlook the devastating impact of other common respiratory illnesses.

These facts from the Forum of International Respiratory Societies' [Global Impact of Respiratory Disease](#) report show that, despite existing cost-effective health interventions, respiratory disease remains a leading cause of death and disability globally.

There are strong links between lung disease, deprivation and health inequity. To address such inequity we must look beyond medical care to the social and environmental determinants of health such as tobacco use, air pollution, climate change and poverty. If we are to achieve lung health for all we need multisectoral collaboration to strengthen and expand global public health, research, and health-care systems.

The Big Five Respiratory Diseases

Respiratory diseases are an immense burden globally, with five of these - chronic obstructive pulmonary disease (COPD) asthma, acute respiratory tract infection, tuberculosis (TB) and lung cancer - being the most common causes of illness and death worldwide:

COPD

An estimated 200 million people have COPD, of which about 3.2 million die each year, making it the third-leading cause of death worldwide.^{i,ii}

Underdiagnosis is common, especially in low-income and middle-income countries (LMICs) where access to basic diagnostics and effective care for COPD is limited^{iii,iv}.

The high prevalence and severity of illness make its economic cost high. For example, the direct cost of COPD is 6% of total health-care spending (€38.6 billion annually) in the European Union and accounts for 56% of the total cost of treating respiratory diseases.^v

The most important risk factor for developing COPD is smoking. Tobacco smoke destroys lung tissue and obstructs airways due to inflammation and mucus, leading to disabling symptoms like cough and shortness of breath.

Household and outdoor air pollution, second-hand tobacco smoke, childhood pneumonia, TB occupational dust, genetic causes and other diseases that involve the airways, are also associated with an increased risk of COPD^{vi}.

Asthma

Asthma is one of the commonest non-communicable diseases globally affecting 262 million people.^{vii} The prevalence of asthma has been rising for the past three decades.^{viii}

People with asthma may experience episodes of breathlessness, cough and wheezing, as well as chronic symptoms that interfere with sleep and limit exercise. Yet asthma can be well controlled using existing inhaled medicines. Inhaled corticosteroids are key to control of asthma in people with persistent symptoms.

In LMICs, underdiagnosis and undertreatment are common, and effective inhaled medicines may not be available or affordable.^{ix}

Acute lower respiratory tract infection or pneumonia

Lower respiratory tract infection or pneumonia is a leading cause of mortality, accounting for more than 2.4 million deaths every year, particularly among those in LMICs.^x

In children under 5 years of age, pneumonia is the leading single cause of death outside the neonatal period^{xi}

Lower respiratory tract infection kills more people than HIV infection, TB, and malaria combined. It is the leading cause of death in children younger than five years, outside the neonatal period, and in the elderly^{xii}.

In 2019, pneumonia-related deaths occurred in approximately 650,000 children, making up almost 15% of the deaths in this age group. In addition, lower respiratory tract infections caused more than 1 million deaths in adults older than 70 years.^{xiii} It is also the second-leading cause of years of life lost due to premature mortality and one of the most frequent reasons for hospitalization.^{xiv} The COVID-19 pandemic has highlighted the importance of pneumonia, with 6.4 million^{xv} deaths through the pandemic, most due to lung disease. The elderly or people with underlying illnesses are at highest risk for developing COVID-19.

Yet pneumonia is largely preventable with current immunisations and is treatable. Lack of access to available effective preventive and management options especially in LMICs is a major cause of pneumonia deaths.

Tuberculosis (TB)

On 14 October 2021, the World Health Organization (WHO) released its annual global report on TB, which shows that TB deaths have risen for the first time in more than a decade due to the COVID-19 pandemic.^{xvi}

TB caused an estimated 1.4 million deaths in 2019, making it the greatest single infectious agent to cause death prior to the COVID pandemic and the 10th-leading cause of overall deaths in the world. Thirty countries accounted for 86% of the cases of TB.^{xvii}

There are also poor health outcomes for those who survive TB ('post-TB'), with a high burden of morbidity and mortality.^{xviii}

Yet new rapid diagnostics have improved the ability to rapidly diagnose TB, and most TB can be treated with available drugs, with new short course therapy effective. Underdiagnosis in LMICs and lack of completion of treatment remain important challenges.

Lung Cancer

Lung cancer kills 1.8 million people each year and is the deadliest of all cancers^{xix}

The International Agency for Research on Cancer (GLOBOCAN) estimated a global lung cancer burden of 2.2 million new cases and 1.8 million deaths in 2020.

Despite many remarkable advances in evaluation and treatment, lung cancer remains a highly fatal disease, with a global mortality incidence ratio of 0.85 in 2016.^{xx}

Five-year survival rates remain only 10% to 20% in most countries, with improvement observed predominantly in countries with higher health development index.ⁱ

Lung cancer is caused by modifiable risk factors, predominantly tobacco smoking. Multiple carcinogens in tobacco smoke cause mutations of both protective and tumor-promoting genes that accumulate over time. The risk of lung cancer correlates with intensity and duration of smoking.

The incidence and mortality rates of lung cancer are higher in high-income countries, reflecting a longer duration of the cultural tolerance of smoking.^{xxi}

This distribution will change as the global tobacco epidemic evolves. More than 80% of smokers live in LMICs.^{xxii}

Factors associated with poor lung health

Nutrition

Poor nutrition is a major factor that predisposes to severe pneumonia, TB and other respiratory diseases and mortality.

Lack of immunisation

Lack of immunisation to common childhood infections that cause pneumonia as well as to COVID-19 are important in LMICs. Strengthening of delivery of these interventions is urgently needed to reduce the burden of disease

Climate change

Global warming and related climate emissions can affect respiratory health directly (heat waves and extreme weather events such as hurricanes and cyclones) or indirectly (increasing air pollutants, wildfire activity, pollens, and moulds, as well as by promoting vectors for transmission of infectious diseases).

Between 2030 and 2050, climate change is expected to cause nearly 250,000 additional deaths every year.^{xxii}

Policies that reduce air pollution from fossil fuel combustion offer a “win–win” strategy for both climate and health, immediately lowering disease burden from air pollution while also mitigating climate change.

Air pollution and tobacco exposure

Globally, at least 2.4 billion people are exposed to the toxic smoke of biomass fuel, typically inefficiently burned in poorly ventilated indoor stoves or fireplaces.^{xxiii}

Air pollution levels remain dangerously high in many parts of the world. Recent data from WHO show that nine of 10 people breathe air containing high levels of pollutants and that 7 million people die every year from exposure to polluted air.^{xxiv}

More than 1.3 billion people worldwide use tobacco, exposing many others via second-hand exposure.^{xxv}

Tobacco use causes 8 million avoidable deaths per year, mostly from cardiovascular or respiratory diseases.^{xxvi} Although respiratory impairment causes disability and death in all regions of the world and among all social classes, poverty, overcrowding, environmental exposures, and generally poor living conditions increase vulnerability.

ⁱ Meghji J, Mortimer K, Agusti A, et al. Improving lung health in low- and middle-income countries: from challenges to solutions. *Lancet*. 2021;397(10277):928-940.

ⁱⁱ GBD Chronic Respiratory Disease Collaborators. Prevalence and attributable health burden of chronic respiratory diseases, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *Lancet Respir Med*. 2020;8(6):585-596.

ⁱⁱⁱ Casas Herrera A, Montes de Oca M, Lopez Varela MV, et al. COPD underdiagnosis and misdiagnosis in a high-risk primary care population in four Latin American countries. A key to enhance disease diagnosis: the PUMA study. *PLoS One*. 2016;11(4):e0152266.

^{iv} Talamo C, de Oca MM, Halbert R, et al. Diagnostic labeling of COPD in five Latin American cities. *Chest*. 2007;131(1):60-67.

^v Eisner MD, Anthonisen N, Coultas D, et al. An official American Thoracic Society public policy statement: novel risk factors and the global burden of chronic obstructive pulmonary disease. *Am J Respir Crit Care Med*. 2010;182(5):693-718.

^{vi} Burney P, Patel J, Minelli C, et al. Prevalence and population attributable risk for chronic airflow obstruction in a large multinational study. *Am J Respir Crit Care Med*. Published online November 10, 2020. doi:10.1164/rccm.202005-1990OC

^{vii} <https://www.thelancet.com/pb-assets/Lancet/gbd/summaries/diseases/asthma.pdf>

^{viii} Global Asthma Network. Global Asthma Report 2018. 2018. Accessed June 24, 2021. <http://globalasthmareport.org/burden/burden.php>

^{ix} Asher I, Pearce N. Global burden of asthma among children. *Int J Tuberc Lung Dis*. 2014;18(11):1269-1278.

^x Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012;380(9859):2095-2128. Published correction appears in *Lancet*. 2013;381(9867):628.

^{xi} GBD 2019 Under-5 Mortality Collaborators. Global, regional, and national progress towards Sustainable Development Goal 3.2 for neonatal and child health: all-cause and cause-specific mortality findings from the Global Burden of Disease Study 2019. *Lancet*. 2021 Sep 4;398(10303):870-905. doi: 10.1016/S0140-6736(21)01207-1. Epub 2021 Aug 17. PMID: 34416195; PMCID: PMC8429803.

-
- ^{xii} Wardlaw TM, Johansson EW, Hodge M; World Health Organization; United Nations Children’s Fund. Pneumonia: The Forgotten Killer of Children. 2006. Accessed April 16, 2021. http://www.who.int/maternal_child_adolescent/documents/9280640489/en/
- ^{xiii} Troeger C, Blacker B, Khalil IA, et al; GBD 2016 Lower Respiratory Infections Collaborators. Estimates of the global, regional, and national morbidity, mortality, and aetiologies of lower respiratory infections in 195 countries, 1990-2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet Infect Dis.* 2018;18(11):1191-1210.
- ^{xiv} Lozano R, Naghavi M, Foreman K, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet.* 2012;380(9859):2095-2128. Published correction appears in *Lancet.* 2013;381(9867):628.
- ^{xv} <https://covid19.who.int/>
- ^{xvi} <https://www.who.int/publications/i/item/9789240037021>
- ^{xvii} Ibid.
- ^{xviii} Allwood BW, van der Zalm MM, Amaral AFS, et al. Post-tuberculosis lung health: perspectives from the First International Symposium. *Int J Tuberc Lung Dis.* 2020;24(8):820-828.
- ^{xix} Sung H, Ferlay J, Siegel RL, et al. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin.* 2021;71(3):209-249
- ^{xx} Rafiemanesh H, Mehtarpour M, Khani F, et al. Epidemiology, incidence and mortality of lung cancer and their relationship with the development index in the world. *J Thorac Dis.* 2016;8(6):1094-1102.
- ^{xxi} Vos T, Lim SS, Abbafati C, et al; GBD 2019 Diseases and Injuries Collaborators. Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *Lancet.* 2020;396(10258):P1204-1222.
- ^{xxii} World Health Organization. WHO Global Report on Trends in Prevalence of Tobacco Use 2000-2025, Third Edition. World Health Organization; 2019.
- ^{xxiii} World Health Organization. Indoor air pollution and household energy. 2021. Accessed April 16, 2021. <https://www.who.int/heli/risks/indoorair/indoorair/en/>
- ^{xxiv} World Health Organization. Air pollution. 2021. Accessed April 16, 2021. <https://www.who.int/healthtopics/air-pollution>
- ^{xxv} World Health Organization. Tobacco. May 2020. Accessed April 16, 2021. <https://www.who.int/newsroom/factsheets/detail/tobacco#:~:text=The%20tobacco%20epidemic%20is%20on%20e%20exposed%20to%20second%2Dhand%20smoke>
- ^{xxvi} United Nations Department of Economic and Social Affairs. Transforming Our World: The 2030 Agenda for Sustainable Development. Publication A/RES/70/1. United Nations; 2015.

