

Prevalence and burden of asthma in China: time to act



Asthma is a common chronic airway disease worldwide in children and adults.^{1,2} The prevalence of asthma is increasing in industrialised countries, whereas a rural upbringing has been shown to protect from allergies and asthma.³ China has developed from a traditional agricultural society into an industrialised country with dense populations in megacities and the accompanying challenges of air pollution. These rapidly changing lifestyle and environmental factors could affect the incidence and prevalence of asthma. Estimates of the prevalence of asthma in China from previous epidemiological studies^{4,5} ranged from 1.2% to 5.8% in the surveyed territories, but the studies did not include systematic lung function testing.

In *The Lancet*, Kewu Huang and colleagues,⁶ on behalf of the China Pulmonary Health (CPH) Study Group, report key data from a national cross-sectional study in China done during 2012–15 and encompassing a representative cohort of more than 50 000 adults (21 446 men and 29 545 women with mean age 44 years). The investigators defined asthma as a self-reported history of diagnosis by a physician or as wheeze symptoms in the preceding 12 months, using the European Community Respiratory Health Survey. Additionally, they incorporated spirometry with reversibility testing. The overall prevalence of asthma in the weighted study cohort was found to be 4.2% (n=2032), whereas the prevalence of asthma with airflow limitation was 1.1% (n=670). There was no difference in asthma prevalence between men and women, or between rural and urban areas. Environmental and lifestyle factors associated with asthma prevalence were cigarette smoking, use of biomass fuel, exposure to high concentrations of particulate matter 2.5µm ($\geq 75 \mu\text{g}/\text{m}^3$), exposure to mould at home (only in never-smokers), and abnormal weight and low education attainment (only in people with asthma without airflow limitation). Other risk factors were a history of childhood bronchitis or pneumonia, presence of allergic rhinitis, older age by 10-year increments, and parental history of respiratory diseases.

An asthma diagnosis was associated with a significant burden of disease in the CPH study. First, within the year preceding enrolment, 15.5% of people with asthma had

at least one asthma attack requiring an emergency room visit, and 7.2% reported at least one hospital admission due to an asthma attack. Second, people with asthma had impaired quality of life, compared with those without asthma, and those with airflow limitation had the lowest quality of life. Despite this asthma burden, only approximately one in four people with asthma (514 [28.8%] of 2032) reported ever being diagnosed by a physician. Although inhaled corticosteroids are the main pharmacotherapeutics for asthma, 5.6% of all patients with asthma and only 10.2% of patients with physician-diagnosed asthma had received treatment with inhaled corticosteroids.

This landmark CPH study has multiple assets, including its large representative study cohort and the multistage stratified sampling method, facilitating both internal and external validity of the results. By extrapolating their epidemiological data to the entire population of China, the investigators estimate that 45 million adults have asthma and that 13 million adults have asthma with airflow limitation. Importantly, asthma was shown to be vastly underdiagnosed and undertreated, leading to an unacceptably high incidence of asthma attacks requiring emergency clinic visits or hospital admissions in China. These impactful data on asthma exacerbations highlight two important points: first, mild asthma is not synonymous with low-risk asthma; and second, untreated asthma appears to be

Published Online

June 20, 2019

[http://dx.doi.org/10.1016/S0140-6736\(19\)31349-2](http://dx.doi.org/10.1016/S0140-6736(19)31349-2)

See Online/Articles

[http://dx.doi.org/10.1016/S0140-6736\(19\)31147-X](http://dx.doi.org/10.1016/S0140-6736(19)31147-X)



Kim Kyung-Hoon/Reuters

the most important cause of uncontrolled asthma in China.⁷ Because of the cross-sectional study design, data on asthma-related mortality are lacking. Other limitations of the study are the absence of prevalence data in children and adolescents and that the diagnosis of asthma was based on a questionnaire, introducing a potential risk of misclassifying chronic obstructive pulmonary disease or bronchiectasis as asthma.

The high prevalence of asthma in China, its underdiagnosis and undertreatment, and the high burden of disease (low quality of life and high exacerbation rates) call for urgent national actions for prevention, diagnosis, and treatment. Preventing cigarette smoking and detrimental exposures to indoor and outdoor pollution will reduce these modifiable risk factors for onset of asthma and asthma attacks.⁸ A national asthma programme in China should aim to raise awareness of asthma among both patients and physicians to increase diagnosis in people with asthma complaints. The very successful Finnish Asthma Programme⁹ has shown the clinical and societal benefits of such a coordinated interdisciplinary approach. Introducing treatment with inhaled corticosteroids as early as possible, either as maintenance-controller therapy or as part of an anti-inflammatory reliever therapy with a low-dose combination of a corticosteroid and formoterol in patients with mild asthma,^{10,11} as recommended by the 2019 Global Initiative for Asthma strategy, has the potential to vastly reduce exacerbations and the burden of asthma in China.

*Guy G Brusselle, Fanny Wai-San Ko

Department of Respiratory Medicine, Ghent University Hospital, Ghent B-9000, Belgium (GGB); Departments of Epidemiology and Respiratory Medicine, Erasmus Medical Center Rotterdam, Rotterdam, Netherlands (GGB); and Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Hong Kong Special Administrative Region, China (FW-SK)
guy.brusselle@ugent.be

GGB reports personal fees from AstraZeneca, Boehringer Ingelheim, Chiesi, GlaxoSmithKline, Novartis, Sanofi, and Teva, outside the area of work commented on here. FW-SK declares no competing interests.

- 1 GBD 2015 Chronic Respiratory Disease Collaborators. Global, regional, and national deaths, prevalence, disability-adjusted life years, and years lived with disability for chronic obstructive pulmonary disease and asthma, 1990–2015: a systematic analysis for the Global Burden of Disease Study 2015. *Lancet Respir Med* 2017; **5**: 691–706.
- 2 de Roos EW, Lahousse L, Verhamme KMC, et al. Asthma and its comorbidities in middle-aged and older adults; the Rotterdam Study. *Respir Med* 2018; **139**: 6–12.
- 3 Ege MJ, Mayer M, Normand A-C, et al. Exposure to environmental microorganisms and childhood asthma. *N Engl J Med* 2011; **364**: 701–09.
- 4 Lin J, Wang W, Chen P, et al. Prevalence and risk factors of asthma in mainland China: the CARE study. *Respir Med* 2018; **137**: 48–54.
- 5 Wang XD, Zheng M, Lou HF, et al. An increased prevalence of self-reported allergic rhinitis in major Chinese cities from 2005 to 2011. *Allergy* 2016; **71**: 1170–80.
- 6 Huang K, Yang T, Xu J, et al. Prevalence, risk factors, and management of asthma in China: a national cross-sectional study. *Lancet* 2019; published online June 20. [http://dx.doi.org/10.1016/S0140-6736\(19\)31147-X](http://dx.doi.org/10.1016/S0140-6736(19)31147-X).
- 7 Bousquet J, Mantzouranis E, Cruz AA, et al. Uniform definition of asthma severity, control, and exacerbations: document presented for the World Health Organization Consultation on Severe Asthma. *J Allergy Clin Immunol* 2010; **126**: 926–38.
- 8 Polosa R, Thomson NC. Smoking and asthma: dangerous liaisons. *Eur Respir J* 2013; **41**: 716–26.
- 9 Kauppi P, Linna M, Martikainen J, Makela M, Haahtela T. Follow-up of the Finnish Asthma Programme 2000–2010: reduction of hospital burden needs risk group rethinking. *Thorax* 2013; **68**: 292–93.
- 10 Bateman ED, Reddel HK, O'Byrne PM, et al. As-needed budesonide-formoterol versus maintenance budesonide in mild asthma. *N Engl J Med* 2018; **378**: 1877–87.
- 11 O'Byrne PM, FitzGerald JM, Bateman ED, et al. Inhaled combined budesonide-formoterol as needed in mild asthma. *N Engl J Med* 2018; **378**: 1865–76.