

Pediatric asthma in the Philippines: risk factors, barriers, and steps forward across the child's life stages

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This 2023, the Global Initiative for Asthma (GINA) selected 'Asthma Care for All' as the theme for World Asthma Day, underscoring the disproportionately high asthma prevalence, morbidity, and mortality in low- and middle-income countries (LMICs). This burden especially impacts children and adolescents worldwide, in whom asthma remains the most common chronic disease and a top cause of disability-adjusted life years.¹ Pediatric asthma remains a serious public health issue in the Philippines, a LMIC in Southeast Asia where nearly 1 in 10 children have asthma – a figure that is likely an underestimation.² We examine the social determinants and systemic barriers that underlie the substantial burden of pediatric asthma in the Philippines across a child's life course, and highlight steps forward.

Prenatal and in utero risk factors

A child's risk for asthma development begins in utero. Maternal asthma and allergic rhinitis are important risk factors that cannot be discounted.³ Beyond genetics, foetomaternal events also influence the risk of asthma later in life. Adverse peripartum events such as premature rupture of membranes and preterm birth have been associated with an increased risk of childhood asthma development and hospitalisation.^{3,4} The Philippines currently ranks 8th highest in the number of preterm births,⁴ with up to 6% of pregnant people without access to professional prenatal care.⁵ The maternal environment also creates a foundation for respiratory complications in their child, as the passage of air pollutants and aeroallergens into the foetal circulation via the placenta sensitises the foetal immune system and promotes asthma development.⁶ In 2015, 23.8% of Filipinos were smokers, exposing many pregnant women, even non-smokers themselves, to tobacco smoke. Threats to asthma development in neonates include being male, receiving early exposure to ventilator-assisted breathing and antibiotics, and low vitamin D levels.⁷

Infancy and toddlerhood

The infant is exposed to additional risk factors once out of the uterine environment. Although risk factors for asthma during infancy are myriad, early environmental exposures represent a major determinant. Children remain vulnerable to the ill effects of air pollution because they inhale a higher volume of air per body weight than adults. A growing body of evidence suggests that early life exposure to tobacco smoke (e.g., through parental smoking) and ambient air pollutants may contribute to pediatric asthma incidence.^{6,8} An estimated 12.37% of the Philippine population, over 13 million people, resides in the National Capital region, where fine particulate matter (PM_{2.5}) can reach 58.4 µg/m³, nearly twelve times the WHO global air quality limit of 5 µg/m³.^{9,10}

Additionally, approximately 80 percent of children with asthma develop symptoms by age 5; however, the disease is frequently mis- and underdiagnosed, especially in infants and toddlers.¹¹ Viral-induced wheezing, a similar presentation to asthma, is common in respiratory syncytial virus (RSV), which surged in its incidence in the country just last year.¹² Thus, recurrence of symptoms and bronchodilator trials become key in diagnosing the disease. In the Philippines, inadequate diagnosis of asthma is only compounded by the limited accessibility of diagnostic tests that objectively confirm expiratory airflow limitation. Pulmonary function tests can cost from between 2000 PHP (~36.8 USD) and 8000 PHP (~147.4 USD), which is roughly a week's salary at minimum wage.^{13,14}

Childhood and adolescence

Inappropriate exposure

Beyond influencing childhood asthma development, tobacco smoke exposure also contributes substantially to the risk of exacerbation among asthmatics.¹⁵ Although Philippine law prohibits tobacco use, sale, and promotion among minors and in schools, the Global Youth Tobacco Survey of 2019 found that among 13–15 year olds in the Philippines, 18.3% of boys and 6.9% of girls are current tobacco users.^{16,17} On-campus smoking was observed by 62%, and 11% had been offered tobacco promotion products.¹⁵ Meanwhile, only 57.6% of respondents reported being taught in school about the dangers of tobacco use.¹⁵ These imply that regulations



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surrounding tobacco access, exposure, and education for Filipino children remain poor.

Challenges to management and its consequences

Local practice guidelines on asthma are frequently published; however, dissemination of updated information to rural areas represents a challenge to adequate asthma control, leading to inappropriate prescription practices. Although short-acting B₂ agonist (SABA) inhaler dependence increases the risk for exacerbation, hospitalisation, and mortality, a nationwide study found that over 10% of Filipino asthma patients over age 12 are over-prescribed SABA canisters.¹⁸ Local data currently remains unavailable for younger children. Furthermore, combination ICS-formoterol inhalers remain expensive and therefore unavailable in most local health centers that provide free medications.

Low health literacy among caregivers may also be a factor, as misperceptions that asthma is an acute (vs chronic) disease may contribute to dismissal of intermittent symptoms and poor inhaler adherence. Overall, these factors may contribute to poor asthma control in the pediatric population, with implications for school absenteeism and costs borne by families.¹¹

Proposed solutions

Clinical

Healthcare workers, especially at the primary care level, should be trained to detect various asthma presentations in children, correctly prescribe inhaled corticosteroids with SABA, and educate families on 1) proper nebulisation and inhaler technique, and 2) environmental modification.¹⁸ Educating adult caregivers and family members, who primarily control the child's environment, is especially essential to reduce harmful environmental exposures (e.g., tobacco smoke, aeroallergens) that predispose to asthma development and precipitate exacerbations. Programs directed at counseling men on smoking cessation not only decrease second-hand smoke exposure for their families but also provide opportunities for positive involvement with their children.¹⁹ This could be a particularly useful strategy in the Philippines where childcare is still traditionally the women's role, and the majority of smokers are men.¹⁷ Notably, such programs should be culturally sensitive, involving stakeholders directly to maximise opportunities for success. The smoking cessation program of the Indigenous Father of Canada has seen success with this approach, by involving community members as facilitators, leaders, and guest speakers. By the end of the program, 28% of the fathers involved were abstinent, and 43% had reduced their smoking.¹⁹

Policy

Public health policy also represents a crucial area for intervention. The Universal Health Care Law, passed in 2019, is a key opportunity to realise access to timely

asthma diagnosis and appropriate management. This can begin with expanding national health financing to broaden access to spirometry and essential asthma medications. The Catalão, Goiás city of Brazil has increased their asthma control rate to 62%, compared to the national average of 9%, by creating a holistic asthma program that not only facilitated interaction among multiple stakeholders, including the municipal government, healthcare personnel, and patients, but also provided free medications.²⁰

Leveraging policy is also critical to control environmental risk factors. The Philippine Clean Air Act of 1999 (RA 8749) regulates major causes of air pollution, such as motor vehicles, industrial emissions, and fuel sources.²¹ Recently enacted tax reforms on both traditional and heatless tobacco products and e-cigarettes may decrease their affordability; however, further work is needed to curb adolescent access to such products, given their rising popularity.

Conclusion

Although we presented each issue concomitantly with a particular lifestage, their effects are often non-linear and far-reaching. Similarly, however, any intervention targeting this population may deliver positive effects spanning decades and even generations. It is our hope that shedding light on environmental and systems barriers to pediatric asthma control in the Philippines galvanises public health policy changes that positively impact patients, especially in other LMICs confronted with parallel challenges.

Children are, by nature, a vulnerable population, largely unable to choose their environment and circumstances. Although the world has seen significant paradigm shifts in asthma treatment during the past decade, children, especially from LMICs like the Philippines, remain hardest hit by lags in equity. As we reflect on 'asthma care for all' this World Asthma Day, any efforts to improve asthma care accessibility moving forward must place children's welfare at their forefront.

Contributors

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Declaration of interests

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