

GLOBAL HEALTH THREATS IN 2019: HOW WILL THEY AFFECT OUR PATIENTS WITH ALLERGIES AND ASTHMA?

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INTRODUCTION

South Africa currently faces many healthcare issues, including HIV, obesity and access to primary healthcare. The country has recently been ranked the unhealthiest nation in the world based on the Indigo Wellness Index – an index comprising ten measurements – including life expectancy and government spend on healthcare.¹

The World Health Organisation (WHO) has listed the greatest threats to global health in 2019, ² of which the following make up the top five:

1. Air pollution and climate change
2. Non-communicable diseases
3. Global influenza pandemic
4. Fragile and vulnerable settings
5. Antimicrobial resistance.

These top five threats to health have important applicability to patients with allergies and asthma, as described below.

AIR POLLUTION AND CLIMATE CHANGE

Air pollution is a major environmental risk to health, both cardiorespiratory and central nervous system (CNS) health, and a significant cause of premature death (worldwide, seven million people die each year from pollution-related complications).² Microscopic particles of pollution can penetrate the respiratory tree and cause lung damage. The effects are exaggerated in low- and middle-income countries in which fuel use in the home often compounds emissions from agriculture, industry and transport. In those patients with asthma, air pollution can exaggerate irritability and inflammation of the airways, leading to more frequent exacerbations.² Oxidative stress has been associated with pollutant exposure, which can possibly even bring on a new onset of asthma.^{3,4} Air pollution can also act as a nasal irritant, compounding the symptoms of allergic rhinitis (AR).

The incessant burning of fossil fuels and agricultural emissions are constantly changing the world's atmosphere, leading to the 'greenhouse effect' of global warming and a shift in weather patterns.⁵ Climate change can influence allergies and asthma through:

- increased concentrations of air pollution, which can aggravate pre-existing asthma;

- increased temperatures owing to climate change, which can lead to an increase in ground-level ozone (a chemical reaction between nitrogen oxide and organic compounds when exposed to sunlight), contributing to urban smog. Ground-level ozone can lead to increased airway inflammation, which can in turn lead to asthma exacerbations;
- warmer temperatures caused by climate change, which can lead to flowers and grasses blooming earlier and longer and releasing increased concentrations of pollens within a longer pollen season. Climate change can also cause some allergen-producing plants to migrate to new areas. The result is likely to be wider areas of pollen distribution and prolonged pollen seasons, aggravating the conditions of those with pollen-sensitive AR and asthma. For example, between 1995 and 2011, the duration of the pollen season in the United States increased by 11–27 days;⁶
- more extreme weather conditions due to climate change, which can lead to complications such as 'thunderstorm asthma': here it is proposed that pollen (and perhaps also mould particles) bursts into smaller particles during a thunderstorm, which can enter and irritate the airways and trigger asthma attacks.⁷

NON-COMMUNICABLE DISEASES

Non-communicable diseases are responsible for more than 70% of deaths worldwide, owing mainly to diabetes, cancer and heart disease. Chronic lower respiratory diseases ranked ninth among the top ten causes of death in South Africa in 2018.⁸

Although not the most common causes of fatalities, atopy-related conditions such as asthma, AR and eczema have become among the most common non-communicable diseases worldwide,⁹ causing significant morbidity. This places a heavy burden on healthcare systems and budgets and will require further healthcare planning as diseases such as asthma continue to increase.

GLOBAL INFLUENZA PANDEMIC

The WHO is constantly monitoring the circulation of influenza viruses to detect pandemic strains. The organisation predicts that the world should be on high alert for another pandemic strain within the next few years. Influenza is a particular threat in those at the extremes of age, during pregnancy, and in those with chronic heart or respiratory diseases, including asthma.¹⁰ In the event of an influenza pandemic, asthmatic patients will

be at greater risk of asthma exacerbations and pneumonitis or pneumonia. Keeping up to date with annual influenza vaccines should be a regular recommendation for asthmatic patients.

FRAGILE AND VULNERABLE SETTINGS

Some 22% of the global population (1.6 billion people) lives in fragile and vulnerable settings accompanied by poverty and/or one or more examples of weak health services, drought, famine, conflict and population displacement.² South Africa has several 'vulnerable' settings in suburban areas and informal settlements. The burden of severe asthma has been found to be highest among socio-economically disadvantaged populations.¹¹ Moreover, migration from traditionally protective rural environments into urbanised environments can lead to an increase in allergic conditions, including asthma.¹²

In conclusion, fragile and vulnerable settings carry a risk of the inhabitants of these areas having asthma which may be sub-optimally controlled and vulnerable to severe exacerbations. Healthcare personnel should try to follow up with patients from vulnerable settings frequently, and take time to educate asthmatics and their caregivers carefully about asthma control and exacerbations.

ANTIMICROBIAL RESISTANCE

The overuse of antimicrobials in people, animals and in the environment is rapidly leading to antibiotic resistance. This

is of significance in populations at higher risk of infectious complications such as those with pre-existing lung disease and asthma.¹³

Patients with allergic diseases of the airways have a reduced local immunity to infections; they are also prone to disease flare-ups, with superimposed infections. If antimicrobials become ineffective in managing infective complications, illnesses such as pneumonia and complicated sinusitis could become life-threatening complications in atopic patients.

The WHO is actively working on global plans to increase awareness of antimicrobial resistance and encourages the prudent use of antibiotics across the relevant sectors.

CONCLUSION

In conclusion, the top five global health threats to be faced worldwide in the next few years have a direct effect on patients suffering from asthma and allergies. Healthcare providers should be acutely aware of these threats and the disease burden they could impose on their patients. In addition, they should have effective management plans in place for patients vulnerable to such threats.

DECLARATION OF CONFLICT OF INTEREST

The author declares no conflict of interest.

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REFERENCES

1. Business Insider Website www.businessinsider.co.za (accessed 15 April 2019).
2. Ten threats to global health in 2019. World Health Organization website who.int (accessed 17 March 2019).
3. Guarnieri M, Balmes JR. Outdoor pollution and asthma. *Lancet* 2014;383:1581–1592.
4. Vardoulakis V, Osborne N. Air pollution and asthma. *Arch Dis Childhood* 2018;103:813–814.
5. Climate and health. Asthma and Allergy Foundation of America's website: aafa.org (accessed 17 March 2019).
6. A national Environmental Education Foundation program. Climate Change and health. www.neefusa.org (accessed 17 March 2019).
7. D'Amato G, Vitale C, D'Amato M, Cecchi L, et al. Thunderstorm-related asthma: What happens and why. *Clin Exp Allergy* 2016;46:390–396.
8. Global Health-South Africa. In Centers for Disease Control and Prevention website, cdc.gov (accessed 15 March 2019).
9. Lopez AD, Williams TN, Levin A, Tonelli M, et al. Remembering the forgotten non-communicable diseases. *BMC Med* 2014;12:200.
10. Pesek RD, Lockey RF. Influenza and asthma: A review. *Worldallergy.org* (accessed 16 March 2019).
11. Yakubovich AR, Gie R. Socioeconomic factors associated with asthma prevalence and severity among children living in low-income South African communities. *SAMJ* 2016;106:407–412.
12. Garcia-Marcos L, Robertson CF, Anderson HR, Ellwood P, et al. Does migration affect asthma, rhinoconjunctivitis and eczema prevalence? Global findings from the international study of asthma and allergies in childhood. *J Epidemiol* 2014;43:1846–1884.
13. Juhn YJ. Risks for infection in patients with asthma (or other atopic conditions): is asthma more than a chronic airways disease? *J Allergy Clin Immunol* 2014;134:247–257.