

Allergy and immunology in Africa: Challenges and unmet needs



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The tremendous increase in allergy in the African continent cannot simply be explained by the change in public hygiene. There are many “prehygiene” communities with sewage-contaminated water supplies, helminth infestations, bare footedness, and poor housing, and still there is a high prevalence of allergic disease. Africans can be exposed to many risk factors facilitating severe asthma and wheezing, including airborne viruses, smoke, indoor dampness, cockroaches, and poor access to health care. Although the reporting on food allergy is inadequate to perform systematic reviews or meta-analyses, the available data suggest that food allergy is underdiagnosed. The rate of new HIV infections in high-prevalence settings in Africa remains unacceptably high. Although the annual number of new HIV infections in Sub-Saharan Africa has decreased lately, new HIV infections in the Middle East and North Africa region have increased; however, the current prevalence of 0.1% is still among the lowest globally. Africa is densely populated, and consanguineous mating is high in some areas of North and Sub-Saharan Africa. This allows for emergence of many autosomal recessive primary immunodeficiency diseases. There is urgent need for the establishment of primary immunodeficiency disease registries, stem cell transplantation facilities, and neonatal screening programs. To address these expanding problems and perform local cutting-edge research, Africans need to be empowered by motivated governments, dedicated funds, and compassionate scientific partnership. (*J Allergy Clin Immunol* 2017;140:1240-3.)

Key words: Africa, allergy, asthma, aeroallergens, food allergy, immunology, primary immunodeficiency, HIV

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Abbreviation used

PID: Primary immunodeficiency disease

Africa, optimistically termed the continent of the future, is burdened by many infectious and noncommunicable diseases. Allergy and immunodeficiency represent a significant sector of health care burden, and the lack of immunologic expertise across the continent is highlighted by the limited publication output from many countries.¹

The tremendous increase in allergy cannot be explained simply by the change in public hygiene. In Africa there are many “prehygiene” communities with sewage-contaminated water supplies, helminth infestations, bare footedness, and poor housing, and still there is a high prevalence of allergic disease.² Africans can be exposed to many risk factors facilitating severe asthma and wheezing, including airborne viruses, smoke, indoor dampness, cockroaches, and poor access to health care.³

There are few allergy specialists because of the prevailing health care infrastructure, the lack of recognition of allergy as a clinical specialty, or both. This phenomenon is described by the World Health Organization as the knowledge/practice gap.⁴ Moreover, many African countries are currently affected by conflict and fragility. Internal conflict and some volatile situations, particularly in North Africa since 2012, are associated with an indirect effect on vulnerability to asthma because social factors can adversely affect the level of the patient’s asthma control.⁵

Although published data on the nature and prevalence of asthma from Africa are scant, there is trend toward an increase in both rate and severity. Data from the International Study of Asthma and Allergies in Childhood reveal an increase in the prevalence of allergic rhinitis and eczema as well. There are considerable variations in the prevalence of wheeze (4.0% to 21.5%), allergic rhinoconjunctivitis (7.2% to 27.3%), and eczema (4.7% to 23.0%) between countries and between centers within the same country. However, consistently high asthma prevalence rates are reported from Cape Town (20.3%), Polokwane (18.0%), Reunion Island (21.5%), Brazzaville (19.9%), Nairobi (18.0%), the urban Ivory Coast (19.3%), and Conakry (18.6%), rates that are comparable with those in Western Europe.⁵ An adapted version of the International Study of Asthma and Allergies in Childhood questionnaire was distributed to a sample of 2645 schoolchildren (11- to 15-year-olds) from Cairo. The overall prevalences of wheeze ever, wheeze during the last year, and physician-diagnosed asthma were 26.5%, 14.7%, and 9.4%, respectively. The prevalence of rhinoconjunctivitis was 15.3%.³ Based on a telephone survey, the age- and sex-adjusted asthma prevalence

TABLE I. Some published data on aeroallergens in Africa from cross-sectional studies

References	Setting	Study population	Methods	Main findings
Mbatchou Ngahane et al, 2016 ¹⁴	Cameroon	Six hundred adult medical students (mean age, 22.6 ± 2.7 y) from Douala	SPT	<i>Dermatophagoides pteronyssinus</i> (24.2%), <i>Dermatophagoides farinae</i> (22.8%), <i>Blomia tropicalis</i> (23.3%), and the cockroach <i>Blattella germanica</i> (15.2%) were the most common sensitizing allergens.
Jeevarathnum et al, 2015 ¹⁵	South Africa	Eighty-five children (1-18 y) with allergic rhinitis and/or asthma from the coastal KwaZulu-Natal Province (KZN) and Johannesburg	SPT	There was a higher prevalence of <i>B tropicalis</i> allergy in the tropical humid northern KZN region (52%) than Johannesburg (3%).
Hossny et al, 2014 ¹⁶	Egypt	One hundred children (1-7 y) with asthma from Cairo	SPT	Sensitization to 1 or more HDM strains was reported in 24%: 12% of subjects were sensitive to <i>D pteronyssinus</i> , 11%, to <i>D farinae</i> , 7% to <i>Lepidoglyphus destructor</i> , 6% to <i>Tyrophagus putrescentiae</i> , and 4% to <i>Acarus siro</i> .
Pefura-Yone et al, 2014 ¹⁷	Cameroon	Two hundred one adolescents and adults (median age, 36 y) with asthma from Yaounde	SPT	Sensitization to <i>D pteronyssinus</i> , <i>D farinae</i> , and <i>B tropicalis</i> was found in 53.2%, 49.8%, and 47.8% of patients, respectively.
Pefura-Yone et al, 2014 ¹⁸	Cameroon	One hundred eighty-four adults with asthma (median age, 38 y) from Yaounde	SPT	Sensitization rate to the cockroach <i>B germanica</i> was 25.5%.
Oluwole et al, 2013 ⁸	Nigeria	One hundred seventy students, 13-14 y old, enrolled within the ISAAC study	SPT	Sensitization to cat hair, cockroach, mango blossom, and mouse epithelium was more frequent in 85 asthmatic patients than in 85 matched healthy control subjects.
El-Ghoneimy et al, 2013 ¹⁹	Egypt	Children with asthma (n = 87), allergic rhinitis (n = 56), and allergic conjunctivitis (n = 57) from Alexandria	SPT	The most common sensitizing pollen was ryegrass pollen, followed by English plantain and then Lamb's quarters pollens.
Seedat et al, 2010 ²⁰	South Africa	Fifty consecutive adults with allergic rhinitis from the Free State	SPT and/or ImmunoCAP RAST	Sensitization rates to HDMs, <i>Tetranychus urticae</i> , and <i>B germanica</i> were 46%, 46%, and 38%, respectively. Storage mite sensitization was not common.
Mpairwe et al, 2008 ²¹	Uganda	Twenty women with asthma, 25 women with eczema, and 95 matched control subjects from Entebbe	SPT	Sensitivity to any allergen was 30.7%, to <i>B tropicalis</i> was 10.9%, to <i>Dermatophagoides</i> mix was 16.8%, and to cockroach was 15.8%. SPT results were significantly associated with a history of asthma but not eczema.
Benzarti et al, 2002 ²²	Tunisia	Five hundred adults from Sousse area (general population)	SPT	Sensitization was 21.8% to HDMs (<i>D pteronyssinus</i> and <i>D farinae</i>) and 18.2% to pollens (olive tree, Graminees, and Parietaire).
Sunyer et al, 2000 ²³	Tanzania	Six hundred eight adult women from Ifakara (general population)	Specific IgE	Positive specific IgEs to <i>D pteronyssinus</i> or cockroach were not associated with the presence of asthma.
El-Gamal et al, 1995 ²⁴	Egypt	Fifty-one children (5-12 y) with asthma from Cairo	Specific IgE	Cockroach-specific IgE was detected in 43 (84%) subjects, 7 (13%) of whom showed a high response (≥1.5 IU/mL).

HDM, House dust mite; ISAAC, International Study of Asthma and Allergies in Childhood; SPT, skin prick test.

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