Global Burden of Atopic Dermatitis

Examining Disease Prevalence Across Pediatric and Adult Populations World-Wide

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KEYWORDS

• Atopic dermatitis • Eczema • Prevalence • Global

KEY POINTS

- The prevalence of atopic dermatitis (AD) varies widely across the globe.
- AD is thought to be primarily a disease of children, and while studies are more limited, current data suggest that it is also a highly prevalent disease across populations worldwide.
- AD is overall a highly common disease that does not appear to discriminate across populations.

INTRODUCTION

Atopic dermatitis (AD) is a common inflammatory disease associated with marked disease burden and increased health care costs.[1–5] AD is thought to be initially present in childhood with an estimated 60% of children displaying symptoms before 12 months of age, and close to 80% having disease onset before age 6.[6,7] AD is often seen as a disease of children with most patients outgrowing their disease by late childhood.[8] However, increasing evidence supports that AD is highly prevalent in adults and that it is a lifelong disease characterized by varying episodes of disease severity throughout a patient's lifetime.[9–11] AD is observed across all ethnicities and can have a profound negative effect on patients and caregivers due to its multidimensional disease burden (**Fig. 1**).[12,13] The purpose of this narrative review is to summarize the most recent data on the global prevalence of AD so that clinicians, patients, and other key stakeholders have a better understanding of the impact of AD across populations.

EPIDEMIOLOGY

A systematic review examining the global prevalence of AD observed an estimated prevalence of approximately 2.6% (95% confidence interval [CI] 1.9, 3.5) or close to 204.05 million people affected. When stratified by age, the prevalence of AD was closer to 2.0% and 4.0% among adults and children, respectively. While the epidemiology of AD varied across geographic regions, 42% of countries lacked reporting of the epidemiologic data underscoring a need for future work in other less-studied countries.[14] (**Fig. 2**).

AFRICA

The prevalence of AD in pediatric cohorts varies greatly across Africa ranging from 0.51% in Tongo to 49.8% in Nigeria.[15–20] In southwestern Nigeria, the prevalence varies from 23% to 27% in school-aged children. Whereas in Senegal, a study of children aged less than 15 years observed an estimated prevalence of 12.2%, and in Ethiopia,

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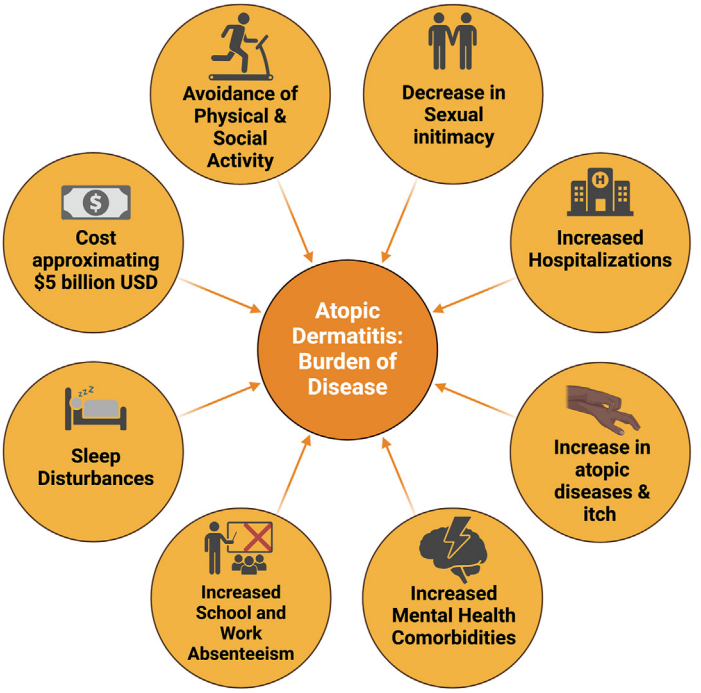

Fig. 1. Multidimensional burden of Atopic Dermatitis (AD). Created with BioRender.com.

the estimated prevalence of AD among children aged 3 months to 14 years was 9.6% (7.2, 12.5%).[21–23] In a separate, retrospective study in Ghana, AD was the most common diagnosis in infants (0–2 years-old), children (3–12 year-old), and adolescents (13–18 year old) with a prevalence of 31.7%, 30.0%, and 14.9%, respectively.[24] In Botswana, AD was the most common diagnosis in infants (70.7%), preschoolers (61.0%), first schoolers (33.4%), and preadolescents (17.5%) and the third most common among adolescents (10.8%).[25] While studies on the prevalence of AD among adults in Africa are limited, the prevalence among adults in central sub-Saharan Africa has been reported as 2.6% with higher prevalence in females (4.3%) compared to males (3.8%).[14] While in Namibia, the prevalence of AD among adults varied from 16.9% to 24.6%.[26]

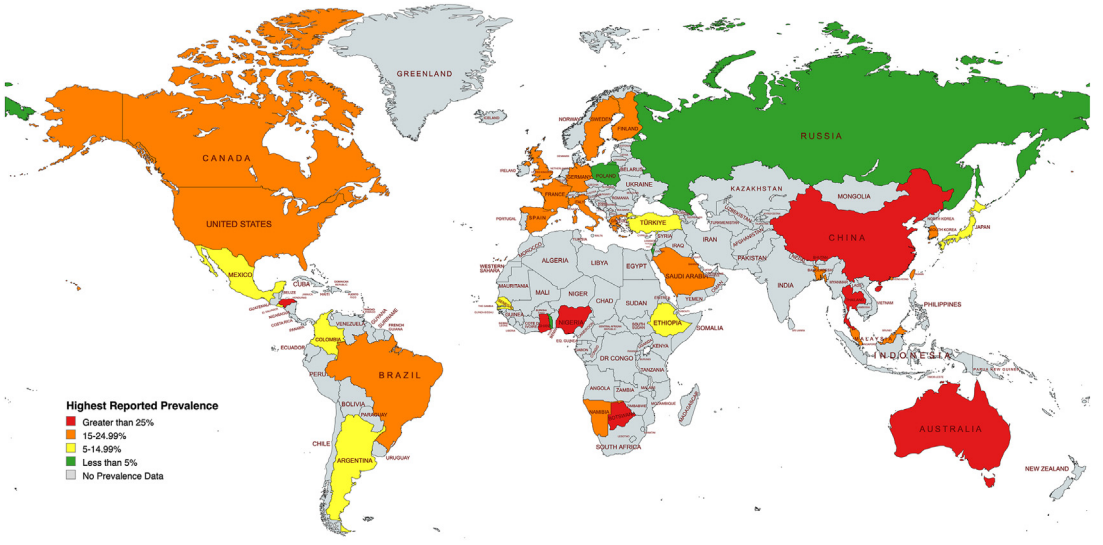

Fig. 2. Worldwide prevalence estimates of Atopic Dermatitis (AD).

MIDDLE EAST, EURASIA, AND EAST ASIA

Studies on the prevalence of AD in Turkey, report AD prevalence ranging from 4.3% to 12.8%.[27,28] A study of school-aged children from ages 7 to 19 years in Saudi Arabia reported AD physician-diagnosed prevalence of 12.5%.[29] While in Israel, the prevalence of AD ranges from 0.9% in children aged less than 6 months to 11.0% among 6 months to 11 years, and 5.8% among those 12 to less than 18 years.[30] Results from the EPI-CARE study, a worldwide, cross-sectional study that examined the 12-month prevalence of AD based on the International Study of Asthma and Allergies in Childhood (ISAAC) criteria and a respondent-reported physician-confirmed diagnosis of AD found an estimated prevalence of 2.7% among children aged less than 18 years in Israel, one of the lowest among all countries surveyed.[31] In Bangladesh, a study that used ISAAC or the United Kingdom Working Party (UKWP) criteria observed an annual prevalence of AD ranging from 2% to 4% to 18% to 20% depending on the criteria used and the pediatric age group under study and a separate study that also relied on ISAAC criteria observed an estimated overall annual prevalence of 11.9% (10.6, 13.3%) among children aged less than 5 years.[32,33] The reported prevalence of AD in Singapore is one of the highest. Findings from a cross-sectional study across households observed an estimated point prevalence of 20.6% in children aged less than 18 years based on UKWP criteria.[34] In a cross-sectional survey of Malaysian children aged 1 to 6 years, observed that the prevalence of AD varied between 12.8% and 16.7%.[35] Similar results were observed in a study from Japan that examined the prevalence of skin diseases over a 10-year period, with AD being the most common skin condition among first graders (12.34%) and the second most common among sixth graders (8.9%).[36] A separate study in a pediatric cohort of Japanese children found an AD lifetime prevalence of 9.9% with lower prevalence in older children compared to younger children and results from the EPI-CARE survey also found a similar prevalence of 10.7%.[31,37] In contrast, AD prevalence is reportedly higher in Korea and China. A study using the data from the 2010 Korean National Health and Nutrition Examination Survey observed a prevalence of 15.0% among children and adolescents, and in China, prevalence estimates vary between 4.76% and 30.48% depending on the population under study and the criteria used for diagnosis.[38–40] In adults across Asia, a cross-sectional survey of ages between 18 and 54 years that met AD UKWP criteria and self-reported a physician's diagnosis of AD, the prevalence varied from 11.9% to 12.3% in Singapore and Malaysia, to 30.4% in China, and was highest for Thailand at 33.7%.[41] Whereas, a study in China conducted across multiple tertiary care hospitals observed a prevalence of 3.7% to 8.7% among adults depending on geographic location.[42] A cross-sectional study of adults in Saudi Arabia observed an estimated prevalence of physician-diagnosed AD of 13.1% and a separate study that used International Classification of Disease codes for AD observed a similar reported prevalence of 11.8% among adult Saudis.[29,43] Based on UKWP and physician-confirmed diagnosis of AD, the prevalence of AD in Israel has been reported as one of the lowest at 3.4% and a similarly low prevalence has been reported for adults in Russia (4.5%).[41]

EUROPE

Like other regions of the World, prevalence estimates for AD vary across Europe, and while most studies focus on prevalence estimates overall or in children, studies on adolescents and adults are limited.[44] In Spain, the prevalence of AD in adolescents has been reported to be 19.8%.[31] A separate study from Catalonia reported a prevalence of 16.9% among adolescents aged 12 to 17 years while a study of adolescents 14 to 16 years from Valencia observed a lifetime prevalence of 34.9%.[45,46] In northern Greece, the prevalence of pediatric AD was closer to 20.9% and similarly, in France and the United Kingdom (UK), the prevalence of pediatric AD has been reported to be 16.5% in children and adolescents aged 6-months to 18 years, and 18.3% among those 0 to 17 years.[31,47] Similarly, a separate study in the UK also observed a prevalence of 15.3%.[31] In contrast, a study that examined trends of AD prevalence in Italian children aged 0 to 12 years, found that from 2006 to 2012 the prevalence of AD increased from 2.66% to 8.45%.[48] Nevertheless, this was lower than those of a separate study, which observed a prevalence of 17.6%, a difference that could be attributed to variation in the criteria used for AD diagnosis.[31] A study from Poland also observed a lower prevalence of AD across pediatric cohorts (6–7 years: 5.34% and 13–14 years: 4.3%).[49] Whereas AD prevalence in children from Germany has been reported to vary between 7.3% (14–18 years) and 17.13% (0–2 years) with an overall prevalence of 10.35% in children aged less than 18 years.[50] Among adults, a study from the UK observed that the prevalence of AD among various cohorts varied between 7.7% (18–74 years) and 11.6% (75–99 years).[47] A Finnish population-based study observed a lifetime prevalence of 21.9% and a 12-month

prevalence of 10.1% in adults aged 30 to 99 years, with prevalence decreasing with age.[51] In a Swedish birth cohort, the prevalence of AD at 24 years of age was 17.8% and the point prevalence of ongoing AD was 8.0% and in Greece, a nationwide cross-sectional study observed a 12-month and lifetime prevalence of AD ranging from 1.7% to 6.4% and 3.7% to 11.4%, respectively.[52]

CENTRAL AND SOUTH AMERICA

Prevalence data for Latin America are more limited compared to other regions. In a cross-sectional study of children aged 1 to 6 years from Bogota, Colombia, the prevalence of AD was 6.5%.[53] A retrospective study using a national claims database from said country observed increasing prevalence rates from 2015 to 2019 (4.23% to 6.77%, respectively), and a separate survey of elementary school-aged children in 2 rural municipalities of Colombia also reported a similar prevalence (6.13%).[54,55] In a population-based survey across 88 municipalities in Brazil that included 6610 households, the prevalence of AD among children less than 12 years ranged from 3.97% to 6.90%, similar to the prevalence reported in ISAAC from a cohort of 23422 Brazilian school-aged children (prevalence of eczema among 6–7 year-old: 8.2%, and 13–14 year-old: 5.0%).[56,57] In contrast, in a separate Brazilian cohort, the 12-months prevalence of AD was closer to 20.1% and ranged from 17.2% to 23.2% in sub-cohorts of children 6 months to less than 6 years and adolescents 12 to less than 18 year-old based on ISAAC criteria.[31] In this same study, the overall 12-month prevalence of AD in children from Colombia, Argentina, and Mexico was 10.8%, 9.7%, and 12.9%, respectively, and a separate study using a modified version of the ISAAC criteria the prevalence of AD during the first year of life was 10.7% and 28.2% in a cohort of infants from El Salvador and Honduras.[58] In a population-based study from Brazil, the prevalence of AD in adults ranged from 0.96% to 1.61% (25–45 years), 0.73%–1.42% (46–60 years), and 0.37%–0.85% (>60 years) while a separate study that relied on UKWP criteria and self-report of physician confirmed diagnosis of AD observed a higher prevalence (9.2%).[41] This same study also observed that the prevalence of AD in adults from Colombia, Argentina, and Mexico was 8.9%, 4.8%, and 9.8%, respectively.[41]

NORTH AMERICA: CANADA AND THE UNITED STATES OF AMERICA

A study using the data from a primary care database from Ontario, Canada observed an AD period prevalence of 3.1% between 2005 and 2015. When separating analysis by age, the AD period prevalence for pediatric patients was 9.9%.[59] In contrast, results of EPI-CARE showed a higher 12-months prevalence of AD (25.4%); however, when the analysis was restricted to children that meet ISAAC criteria and self-report of a physician-confirmed diagnosis of AD the prevalence was closer to 15.1%.[31] Studies that examined the prevalence of AD in adult populations from Canada have also observed lower prevalence compared to pediatric cohorts. For example, a web-based survey in which adults were considered to have AD if they met modified UKWP or ISAAC criteria and self-report of a physician's diagnosis of AD observed a point prevalence of 3.5%. In addition, among adults currently being treated for AD, the prevalence was lower at 2.6%, which is closer to the prevalence reported in a separate study that relied on electronic medical records (1.8%).[9,59]

In the United States (US), a prospective cohort study of mothers and babies with AD observed that the prevalence of AD was 15.0% (11.0%-18.9%), 15.1% (11.5%-18.7%), and 14.5% (10.4%%-18.5%) in children aged 5, 9, and 15 years, respectively.[60] Results from the 2021 National Health Interview Survey (NHIS), a nationally representative survey of the US population reported an overall prevalence of 10.8%.[61] When stratified by age, the prevalence of eczema was 12.1% in children aged 6 to 11 years, followed by 10.4% among children 0 to 5 years of age, and 9.8% in children aged 12 to 17 years.[61] These results are similar to those of the more recent EPI-CARE survey, which observed a prevalence closer to 9.8%.[31] Similar to other countries, the prevalence of AD among US adults is lower compared to pediatric cohorts.[11,62] Two separate population-based studies observed a prevalence closer to 7%. A study that examined the 1-year prevalence of AD among adults using the NHIS reported a prevalence of 7.2%.[62] Whereas a separate study using the data from the Growth from Knowledge (GfK) Knowledge Panel, which relied on modified UKWP criteria for the diagnosis of AD, reported an overall prevalence of 7.3%.[11]

OCEANIA

Few studies have examined the prevalence of AD in populations across countries from the geographic region of Oceania. The data from a population-based database that included 2.1 million patients from 494 primary care practices across Australia observed an overall lifetime and current prevalence of 16.4% and 6.3%, respectively.[63] The prevalence of AD decreased with age in children aged 0 to 4

years having the highest prevalence (lifetime prevalence: 18.8% [17.9, 19.7] and current prevalence: 13.8% [13.1, 14.5]).[63] A separate study that included the data from 4 different cohorts in Australia and Tasmania but used varying definitions to capture eczema or AD diagnosis, observed that in children less than 6 years, the prevalence of ever having eczema varied between 28.8% and 35.6% and the prevalence of current eczema ranged between 16.7% and 26.6%.[64] In this same study, the eczema prevalence ranged between 13.8% and 48.4% across adults while the 1-year prevalence was 15.1% at age 18 but decreased to 8.8% by age 53.[64] A separate study observed that the lifetime prevalence and current prevalence of AD was lowest among ages 30 to 34 years (lifetime prevalence: 11.6% [10.9, 12.2] and current prevalence: 5.0 [4.8, 5.3]) and highest among ages 85 to 89 years (lifetime prevalence: 24.8 [23.5, 26.2]) and 80 to 84 years (current prevalence: 8.0 [7.4, 8.6]).[63]

In summary, AD is a highly prevalent disease worldwide in both pediatric and adult populations. Studies that examine differences in prevalence across populations may be difficult to compare due to differences in study designs including how AD is diagnosed. Despite these limitations, understanding the full burden of AD is critical if the authors are to improve the lives of patients and caregivers living with AD and gain a broader understanding of impact of AD across the globe.

CLINICS CARE POINTS

- AD is a highly prevalent disease in children and adults worldwide.
- While AD is not thought to discriminate across populations, worldwide prevalence estimates vary greatly.
- Understanding the full burden of AD including the societal impacts of this disease is critical to improving the care and quality of life of patients with AD.

DISCLOSURE

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