

# Allergic rhinitis

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Allergic rhinitis (AR) represents a global health concern where it affects approximately 400 million people worldwide.

The prevalence of AR has increased over the years along with increased urbanization and environmental pollutants thought to be some of the leading causes of the disease.

# Epidemiology of Allergic Rhinitis

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Allergic rhinitis prevalence has increased significantly since the 1990s.

It is reported to affect approximately 25 and 40% of children and adult globally, respectively.

Approximately 80% of AR symptoms develop before the age of 20 years and peak at age 20–40 years before gradually declining.

# Epidemiology of Allergic Rhinitis

Meta-analysis studies have shown the sex-specific differences in the prevalence of AR.

Notably, the incidence of AR is higher in males than in females before puberty, but this trend reverses after puberty and in children less than 11 years of age, significantly more boys than girls exhibited rhinitis symptoms (male–female ratio 1.21), whereas in adolescents (11 to 18 years of age), males were significantly less affected than females (male–female ratio 0.90).

# Epidemiology of Allergic Rhinitis

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Allergic rhinitis represents a common pediatric problem where approximately 40% of pediatric AR patients develop symptoms as early as age 6 years old and increase with age.

# Epidemiology of Allergic Rhinitis

AR in the pediatric population is one of the most common chronic pediatric disorders. The prevalence of AR is roughly 5% in children by 3 years of age, increases with age from 8.5% of 6–7 year-olds to 14.6% of 13-14 year-olds, and reaches more than 11.8% to 46% in people aged 20–44.

AR is known to peak in the second to fourth decades of life and then gradually decline.

# Epidemiology of Allergic Rhinitis

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In addition, AR is a systemic inflammatory disease and often comorbid with other disease such as asthma, atopic disease, sinusitis, conjunctivitis, and otitis media, complicating the treatment and management of AR patients.

# Epidemiology of Allergic Rhinitis

Seasonal allergic rhinitis seems to be more common in the pediatric age group, whereas chronic rhinitis is more prevalent in adults.

A systematic review from 2018 estimated that 3.6% of adults had missed work, and 36% had impaired work performance due to allergic rhinitis.

Economic evaluations have shown that indirect costs associated with lost work productivity account for the majority of the cost burden for AR.

# Epidemiology of Allergic Rhinitis

Prevalence of AR has increased with years due to several risk factors including global urbanization as shown by several studies comparing AR prevalence in urban settings with rural areas. This is mainly caused by increased levels of pollutants [e.g., traffic-related pollutants and particulate matter 2.5 (PM<sub>2.5</sub>)] that can exacerbate pollen-sensitized AR.

It has been reported that AR is more prevalent in urban areas compared with rural areas.

Climate changes also prolong pollen season as reported in Europe over the last three decades along with more frequent seasonal allergies.



# Epidemiology of Allergic Rhinitis

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Smoking, however, did not show a significant association with the severity of nasal symptoms in AR but usually impacted patients with chronic rhinitis.

Conversely, maternal smoking conferred the greatest risk in pediatric AR.

Novel tobacco products such as electronic cigarette and heated tobacco products increase the risk of AR in adolescents compared with traditional smoking.

# Epidemiology of Allergic Rhinitis

Risk factors for developing AR include a family history of atopy, male sex, a presence of allergen-specific IgE, a serum IgE greater than 100 IU/mL before age 6, and higher socioeconomic status.

Studies in young children have shown a higher risk of AR in those with an early introduction to foods or formula and/or heavy exposure to cigarette smoking in the first year of life. Although many recent studies have evaluated the link between pollution and the development of AR, no significant correlation yet exists.

# Epidemiology of Allergic Rhinitis

Interestingly, there are several factors identified that may have a protective effect on the development of AR. The role of breastfeeding in the development of AR is often debated, but it is still recommended due to its many other known benefits and no associated harms. There is no evidence that pet avoidance in childhood prevents AR; however, it is hypothesized that early pet exposure may induce immune tolerance. There is a growing interest in the "farm effect" on the development of allergies, and a meta-analysis of 8 studies showed a 40% lower risk in subjects who had lived on a farm during their first year of life

# Epidemiology of mixed rhinitis

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Mixed rhinitis is defined as the coexistence of both allergic and nonallergic rhinitis. It has been reported to occur in approximately 44% to 87% of patients with allergic rhinitis and may be more common than either pure allergic rhinitis or nonallergic rhinitis.

# Epidemiology of Atrophic Rhinitis

Atrophic rhinitis is a chronic condition with unknown etiology.

The condition is predominantly seen in young and middle-aged adults, especially females (6:1.5).

It is a common condition in tropical countries such as India, Pakistan, China, the Philippines and Malaysia, in Saudi Arabia, Egypt, Central Africa, Eastern Europe (Poland), Mediterranean areas and Latin and South America.

Primary atrophic rhinitis has a high prevalence in the arid regions bordering the great deserts of Saudi Arabia. A racial preference is seen amongst Asians, Hispanics and African-Americans. Prevalence is low in equatorial Africa

# Epidemiology of Atrophic Rhinitis

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In those countries with a higher prevalence, primary atrophic rhinitis can affect between 0.3% and 1.0% of the population. It appears to be more common in lower socio-economic classes, poor populations and those living in conditions of poor hygiene.

# Epidemiology of Atrophic Rhinitis

The exact aetiology of primary atrophic rhinitis is unknown but many factors are implicated. It is seen to have a polygenic inheritance in 15% to 30% of cases, while other studies have revealed either an autosomal dominant (67%) or autosomal recessive penetrance (33%).

Chronic bacterial infection of the nose or sinus may be one of the causes of primary atrophic rhinitis.

A developmental aetiology has been suggested, which considers the disease to be associated with poor pneumatisation of the maxillary sinuses, congenitally spacious nasal cavities, excessively patent nasal cavities in relation to shape and type of the skull and platyrrhinia.

Nutritional deficiency, especially of iron, fat soluble vitamins and proteins, has also been suggested

# Epidemiology of Atrophic Rhinitis

Secondary atrophic rhinitis, however, is known to occur as a consequence of many factors. These include local injury involving extensive accidental maxillofacial and nasal trauma/surgery (notably turbinate surgery), recurrent acute and chronic suppurative infections of the nose/paranasal sinuses (PNS), viral exanthems in children, chronic granulomatous disorders of nose (tuberculosis, lupus vulgaris, syphilis, leprosy, rhinoscleroma, typhoid fever and AIDS).



# Epidemiology of Vasomotor Rhinitis

Vasomotor rhinitis is the most common of the nonallergic rhinitis subtypes, comprising at least two-thirds of all nonallergic rhinitis sufferers.

It has highest prevalence in females and is commonly seen between 20 – 60years of age group.

It has a 5-10% prevalence in worldwide population. It is difficult to distinguish the symptoms of VMR from other types of rhinitis.

# Rhinitis prevention

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Avoiding relevant allergens and irritants is the primary prevention for allergic rhinitis. But this is not always easy. Allergens, such as dust mites, can be hard to spot and can breed in even the cleanest house.

It can be difficult to avoid contact with pets, particularly if they belong to friends and family.

# Rhinitis prevention

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## Dust mites

Dust mites are one of the biggest causes of allergies. They're microscopic insects that breed in household dust. It is recommended that patients with a house dust mite allergy use allergen-proof bedding, hard vinyl floor coverings instead of carpet, synthetic pillows and acrylic duvets instead of woollen blankets. and maintain a relative humidity level in the home of less than 50%.

## Pets

Pet fur does not cause an allergic reaction. But exposure to flakes of their dead skin, saliva and dried urine.

# Rhinitis prevention

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## Pollen

Different plants and trees pollinate at different times of the year.

## Mould spores

Moulds are not allergens, but the spores they release are.

Using windows filter, keeping windows closed, and spending less time outside during peak pollen seasons are all ways to lessen exposure to outdoor mold and pollen.

# References

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