

## Allergies Across America™

EXECUTIVE SUMMARY

The Largest Study of Allergy  
Testing in the United States

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I am pleased to present to you the first Quest Diagnostics Health Trends™ allergy report, *Allergies Across America™*. This report is the largest analysis of allergy testing of patients in the United States under evaluation for medical symptoms associated with allergies.

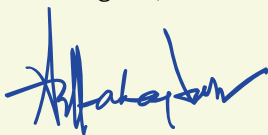
Allergies are a major public health concern, affecting the healthcare system, employers, and, indeed, patients. By the time you finish reading this report, you may be surprised by the dynamic nature of allergies in the United States. We found evidence that allergen sensitization is increasing, and that the type of allergens affecting Americans evolved during the 4 years we examined. We also found that allergens have a disproportionate negative effect on children. A novel finding is that men experience higher rates of sensitization to allergens than women. Even the way allergies are diagnosed is changing, with a clear shift towards greater allergy testing by pediatricians and other primary care physicians.

We found evidence supporting the pattern of allergy progression known as the “allergy march,” in which allergen sensitization often evolves from food to environmental allergens. Our analysis identified a connection between allergies and asthma, building on prior research, but using our much larger data set. In addition, we revealed disparities in our healthcare system that should be cause for alarm for any policy maker, physician, or parent.

Our allergy report adds to our collection of Quest Diagnostics Health Trends reports developed in recent years on health concerns affecting large numbers of patients in the United States. Based on analyses of our national database – consisting of more than 1.5 billion patient encounters since January 2000 – previous reports have focused on chronic kidney disease, diabetes, heart disease, H1N1 (2009) Influenza A, and rotavirus. I encourage you to read these reports, which can be found at [QuestDiagnostics.com/HealthTrends](http://QuestDiagnostics.com/HealthTrends).

With mounting demands on our healthcare system, our nation must devise new, innovative methods of providing high quality services. Greater knowledge of the patient impact and clinical management of chronic diseases, such as allergies, will be increasingly vital to the ability of healthcare professionals to deliver the best possible care.

Best regards,



Surya N. Mohapatra, Ph.D.  
Chairman and Chief Executive Officer  
Quest Diagnostics

P.S. A PDF of this report and additional content about allergies and IgE testing are available at [QuestDiagnostics.com/HealthTrends](http://QuestDiagnostics.com/HealthTrends).

## SUMMARY

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Allergies are one of the most common health conditions, affecting 1 in 5 Americans. Allergies account for more than 17 million physician office visits, 30,000 emergency room visits, and several hundred deaths each year.<sup>1</sup> Individuals with allergies are at heightened risk for other diseases, including asthma.

As the world's leading diagnostic testing company, Quest Diagnostics is uniquely positioned to analyze the largest national database of allergy blood tests and derive insights into the impact of allergies on the health of Americans.

For this Quest Diagnostics Health Trends report, we analyzed de-identified test results from more than 2 million patient encounters over a 4-year period. Our analysis included results from patients of both genders, from infants to the elderly, residing in every U.S. state and the District of Columbia.

Allergies are clinically diagnosed based on factors that include medical examination, patient history, laboratory testing, and, as appropriate, allergen exposure testing. Our study is based on testing using the ImmunoCAP<sup>®</sup> specific immunoglobulin E (IgE) blood test (ImmunoCAP), the "gold standard" of allergy blood tests.<sup>2,3</sup> Each test result identified sensitization to 1 or more of 11 common allergens. Sensitization refers to a test result that indicates a patient has an allergen-specific IgE, which is important for diagnosing an allergy but may not by itself be sufficient to prompt symptoms. The allergens we evaluated were 5 foods (egg white, milk, peanut, soybean, and wheat), common ragweed, mold, 2 types of house dust mites, cat epithelia (skin), and dog dander.

Our study is the largest study of laboratory test results from a nationally representative U.S. population seeking medical care for symptoms associated with allergies. In addition to size, our study's advantages include the use of validated quantitative laboratory test results of allergy sensitization, rather than survey responses from physicians or patients. As the vast majority of the patients in our study likely presented with new or changing allergy signs and symptoms, our analysis does not measure the prevalence of allergies in the general population.

### Our findings include:

- **America's allergy problem is increasing.** Our analysis found that the overall allergen-sensitization rate increased by 5.8% over the 4-year study period. In addition, the number of patients tested for these 11 allergens increased 19%, significantly faster than growth in laboratory testing in general (see page 12).

*"The Quest Diagnostics Health Trends Report studies the effect of allergies on a uniquely massive scale. It represents people across the United States using a highly respected and standardized laboratory methodology."*

— Andrew H. Liu, M.D.  
Associate Professor  
Allergy and Clinical Immunology  
National Jewish Health  
Denver, Colorado

- **Sensitization to 2 common environmental allergens is increasing, consistent with prior climate change research.** Sensitization to common ragweed grew 15% - more than any other allergen we analyzed - with the Southwest, Mountain, and Plains States experiencing the highest sensitization rates. These findings are consistent with other research suggesting climate change may contribute to an increase in certain environmental allergens, such as ragweed. Mold sensitization grew 12%, a finding that is potentially clinically important given other research showing that molds may trigger allergic sensitization and aggravate asthma (see page 13).
- **Allergies are prevalent throughout the U.S., occurring in each of the country's 30 largest cities.** Yet, some cities demonstrated higher rates of sensitization than others, with Dallas, Phoenix, Baltimore, Washington, D.C., and Boston experiencing the greatest burden (see page 16).
- **Men had higher sensitization rates than women at all ages, a novel and potentially clinically significant finding.** This novel finding differs from other studies that suggest that allergies are more prevalent among women. While additional research is required, we hypothesize that the criteria for positive specific-IgE allergic response may differ between males and females, a finding of potential clinical significance. We provide 3 hypotheses for why our research differs from prior studies, including the possibility that the criteria for positive specific-IgE allergic response may differ between males and females, and possibly at different ages (see page 19).
- **Children had higher sensitization rates than adults.** Of children tested between 2 and 17 years of age, 53% showed sensitization to 1 or more allergens. Nearly 1 in 5 children with sensitization showed a high degree of IgE sensitization, compared to about 1 in 10 adults (see page 21).
- **Allergies progress along a pattern known as the allergy march.** The allergy march is a well-documented phenomenon by which sensitization to foods early in life may heighten a child's likelihood of developing more severe allergic disease, including asthma, later in life. Our cross-sectional study is the largest to reveal a pattern of allergen sensitization consistent with the allergy march, with high rates of food-allergen sensitization most commonly found in early childhood and high rates of sensitization to other allergens occurring more frequently with age. To better control the allergy march, physicians may periodically evaluate patients with allergies to assess changes in allergen sensitization (see page 24).



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*The largest allergy study ever conducted found America's allergy problem is both pervasive and increasing.*

*The widespread  
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- **Peanut sensitization was high in children.** Peanuts were the most common source of food sensitization in children 6 to 18 years of age, affecting nearly 1 in 4 school-aged children tested. Yet, peanut sensitization is even more prevalent in children 5 years of age and younger, affecting about 30% of children in this age group. Our data suggest peanut allergies remain an important source of concern in children (see page 25).
- **Patients with asthma had more allergies.** On average, patients with asthma who were also found to have IgE sensitization were sensitive to 4.1 allergens compared to 3.4 allergens in patients who were not identified as having asthma. The link with asthma was strongest for indoor allergens such as mold, cats and dogs, and house dust mites. Our findings support medical guidelines recommending that clinicians and patients with asthma identify and minimize exposure to allergens that may aggravate asthma (see page 28).
- **Economically disadvantaged children were 18% less likely to be tested by the age of 5 than economically advantaged children.** This novel finding suggests that economically disadvantaged children may be less likely to have their allergies diagnosed in early disease stages, when treatment may help prevent the onset of the allergy march leading to more severe allergy-related conditions, including asthma (see page 30).
- **The widespread availability of blood-based allergy testing is changing clinical practice.** Allergies are increasingly being diagnosed by pediatricians and other primary care physicians, whose ordering of ImmunoCAP from Quest Diagnostics grew 46% and 49%, respectively, over the 4-year period. Ordering from allergists, in contrast, grew by only 23% over the same time period. The states of New York and New Jersey, as well as the Pacific Northwest, led the country in the adoption of blood-based allergy testing, while the mid-Atlantic, Great Lakes, and Midwestern regions lagged behind (see page 32).

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