

Food allergy: What are people looking for? An infodemiology study

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Key Messages

Google Trends is a powerful tool that can be used to determine the population's interest in food allergy and how this interest can fluctuate.

These preliminary findings may be included in future guidelines for the diagnosis, therapy, and follow-up of patients with food allergies.

Capsule Summary

The aim of this study is to assess the public interest in the most common food allergens from different countries around the world using Google Trends as an infodemiology tool.

Keywords: food allergy, milk allergy, peanut allergy, shellfish allergy, google trends, infodemiology

Introduction

Food allergy (FA), an IgE reaction, is rising steadily over time (1). FA is present in 10% of the population, varying according to region (2).

Google's search engine has become a significant source of medical information; however, this information varies in quality (4). Google Trends (GTr) is a free online service that gives users access to current and historical data on Google searches from 2004 up to the present (4).

This study aims to assess the public interest and information-seeking behavior regarding food allergies over a specified period. The findings from this study will contribute to a better understanding of the

online information-seeking behavior of individuals and provide valuable insights for healthcare professionals, international societies, and public health organizations in developing targeted interventions and educational initiatives.

We conducted several searches on Google Trends (GTr) (<http://trends.google.com>) on April 1st, 2023. The data was compiled across ten countries from January 1st, 2012, to December 31st, 2022. Based on a literature review indicating high prevalence in various countries, cow's milk, peanut, and shellfish allergies were selected as the primary allergens (5). The countries were selected using GTr performing a search for "Food allergy" as a topic with the "worldwide" category, we analyzed the countries with an RSV score higher than 50. Ten countries were included: Australia, Canada, Finland, Hungary, Ireland, Netherlands, New Zealand, Philippines, Singapore, and the USA. RSV is a value that expresses the relation between a specific search in relation to the overall searches on Google at a specific time among other modifiable variables. RSV ranges between 100 and 0 in descending order, the former being a high popularity and the latter a low one. For this study, search volume trends and interest over time were developed using Statistical Package for Social Science (version 21.0; SPSS, Chicago, USA).

Results

Interest over time

Over the years, there has been a noticeable growth in people's interest in searching about "food allergy" as a topic of search, as evidenced by increased Google search trends from 2012 to 2022 in the 10 countries examined. Although the interest in peanut allergy has been relatively low in the last decade, in the last 2 years there has been a prominent increase in searches in Australia, the USA, Finland, the Netherlands, and New Zealand. On the other hand, there was a decreasing interest in Canada, Hungary, Ireland, and the Philippines. Milk allergy was the most searched topic in 6 out of 10 countries of interest, with a sharp spike since 2021 in Canada, the USA, and Australia. In contrast, "shellfish allergy" showed the lowest RSV, being only searched mainly in the Philippines and Singapore (**Figure 1 & 2**).

2.2 Most searched topics

The related queries with the most interest were different terms and definitions for allergy, such as "allergy", "allergies", "food allergy" and "peanut allergy". Among the most searched signs and symptoms were "rash", "eczema", "urticaria", and "anaphylaxis". The country with the highest searches for signs and symptoms was the US, and the allergen was shellfish. There was a high interest in searching for some related diseases to milk allergy, including "lactose intolerance", "dairy intolerance" and "celiac disease". The countries that most sought diagnostic methods were Ireland and Hungary, with queries such as "food allergy test" and "food intolerance testing". "Baby" and "toddler" were the age-related searches, the first being included in the top 5 searched entities in 8 out of 10 countries. "Epinephrine", "immunoglobulin", "cetirizine", and "antihistamine" were identified within the therapeutic queries with the highest RSV in the Philippines. Food alternatives such as "almond milk", "soy milk", and "lactose-free milk" were interesting findings for milk allergy queries in all 10 countries. (**Table 1**)

Discussion

Google is a tool for gathering information (4). Infodemiology studies in food allergy are scarce (6). The spike of interest in milk allergy in 2021 for 6 out of the 10 selected countries might be related to the findings of a study in the UK (7) which showed that cow's milk allergy may be the root of three-quarters of newborns' two or more allergic symptoms at some point in the first year of life. Another possible reason for the trending phenomenon may be the hospitalizations and deaths of infants in the USA because of contaminated Abbott baby formula products in May of 2022 (8). The worldwide prevalence of shellfish allergy ranges from 0.2 to 0.6%, but this number is much higher in the Asia-Pacific region (9). Within this area, teenagers in the Philippines and Singapore report the highest prevalence of this allergy, with 5.12% and 5.13% respectively (9). This data correlates with our findings. According to Anvari et. al., food allergy, particularly IgE mediated, can present with clinical manifestations in different systems (10), "hive", "rash", "eczema" and

“anaphylaxis” were the most searched clinical signs in our study. This shows that users have a concern for cutaneous manifestations and life-threatening ones. The current management of food allergy relies on the avoidance of allergens, preparedness to promptly address allergic reactions, and interventions to alleviate symptoms, including the administration of antihistamines and immunotherapy (11). We found a considerable level of interest in the 10 chosen countries regarding food alternatives such as “almond milk” and “soy milk”, as well as “epinephrine” due to its critical role as the primary therapeutic intervention for anaphylaxis, an acute and potentially life-threatening allergic reaction (12).

Conclusions

The findings of this study show how GTr is a powerful tool that can be used to determine what the user’s interest is in food allergy and how this interest can fluctuate. This information could be considered when new guidelines were developed. It is important to keep pursuing studies in infodemiology with the aim to tailor a more specific practice, aimed at improving public information and providing evidence-based guidance on topics such as “Food allergy” for those users that need accessible and accurate information.

Abbreviations: Food allergy (FA), Google Trends (GTr), related search volume (RSV), Immunoglobulin E (IgE), United States of America (USA), United Kingdom (UK)

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Table 1. Average RSV of related queries from all 10 countries, divided in seven categories.

Allergy Terms	Allergy Terms	Related Diseases	Related Diseases	Clinical Manifestations
allergy	100	lactose intolerance	100	hives
peanut allergy	100	celiac disease	55	lactose intolerance symptoms

milk allergy	100	food intolerance	16	seafood allergy symptoms
food allergy	100	intolerance	13	symptoms of milk allergy
seafood allergy	98	milk intolerance	12	anaphylaxis
dairy	60	dairy intolerance	7	milk allergy symptoms
dairy allergy	59	cereal allergy	3	food allergy symptoms
allergie alimentaire	19	cross allergy	3	dairy allergy symptoms
allergy to milk	17	wheat allergy	3	allergy rash
skin allergy	11	grain allergy	3	food allergy rash
allergic	11	lactose intolerant	2	allergy symptoms
food allergy is	11	soy allergy	2	food allergy symptoms
cows milk allergy	11	soy milk	2	milk allergy rash
allergic to peanuts	9	milk sugar sensitivity	2	seafood allergy rash
shellfish allergy	7	food poisoning	1	seafood allergy reaction
common food allergies	6	celiac	1	allergic reaction
common allergies	6			shrimp allergy
what is a food allergy	6			shellfish allergy symptoms
fish allergy	4			fish allergy symptoms
shrimp allergy	4			shrimp allergy symptoms
soy allergy	4			eczema
allergy to peanuts	3			cow's milk allergy symptoms
peanut oil peanut allergy	3			Symptoms cow's milk allergy
nut allergy	3			

Figure 1. Interest over time of different allergens from 2012 – 2022

Figure 2. Average RSV per allergen



