# The percentage of people with food allergy in the community

*By Pia Nørhede*

**Why is it important to know the percentage of people with food allergy in the community?**
Individuals with food allergy develop symptoms after eating foods that for the vast majority of the population are part of a healthy diet. The only way for the allergic individual to manage food allergy is to avoid eating the food that causes the allergic reaction. The level of avoidance required may seriously impair the quality of life of the food allergic individual. The impact also extends to the people (e.g. family, friends, teachers) around the allergic individual, as all have to be vigilant to protect the allergic individual from the foods, which may trigger an allergic reaction. For that reason, the quality of life of a significant part of the population may be affected by food allergy. We cannot know the extent of the problem without knowing the percentage of people with food allergy in the community.

Many people believe that the percentage of people with food allergy is increasing. However, with few exceptions we do not have any data that can clarify whether this is in fact true. It is a clinical impression that the occurrence of food allergies changes with age and varies across different geographical areas, for example, because of different dietary patterns. If indeed such variations exist, it would be a great help for researchers who are trying to find out why some people develop food allergies.

**How do researchers find out the percentage of people with food allergy in the community?**
Different studies that have reported on the percentage of people with food allergy have used different study designs. Areas where the studies differ are:

a. Populations included in the study
b. Diagnostic procedures used to identify food allergies

***Who to include in the study?***
Food allergies need to be assessed in a representative sample of a population in order to obtain a reliable estimate of the percentage of people with food allergy in the general population. Many studies have reported the percentage of people with food allergy in a selected group of people, for example, people with symptoms of allergy. In such a selected group of people, food allergies will be more common than in the community.

Even if the food allergy is assessed in a representative sample of a population, the proportion of people who agree to participate in the study may influence the result. Studies with low response rates tend to give a result with a higher percentage of people with food allergy, probably because people not responding have fewer problems in connection with food intake than the ones who respond.

***How to diagnose food allergies?***

Most studies performed in a representative sample of the population have used questionnaires to ask people if they believe they are allergic to food. The quality and results of such studies varies depending on the quality and design of the questionnaire. Some studies have used short questionnaires based on as little as 2 questions while others have used a screening questionnaire combined with an interview to confirm suspicion of food allergy. Different questions may give different results. The question: "Have you ever had a food allergic reaction?" gives a different result from: "Have you had a food allergic reaction during the last year?". Studies with **self-reported food allergy** will tend to overestimate the percentage of people with food allergy in the community, as you might not be able to tell the difference between allergy and other reactions to foods as the symptoms may be similar.

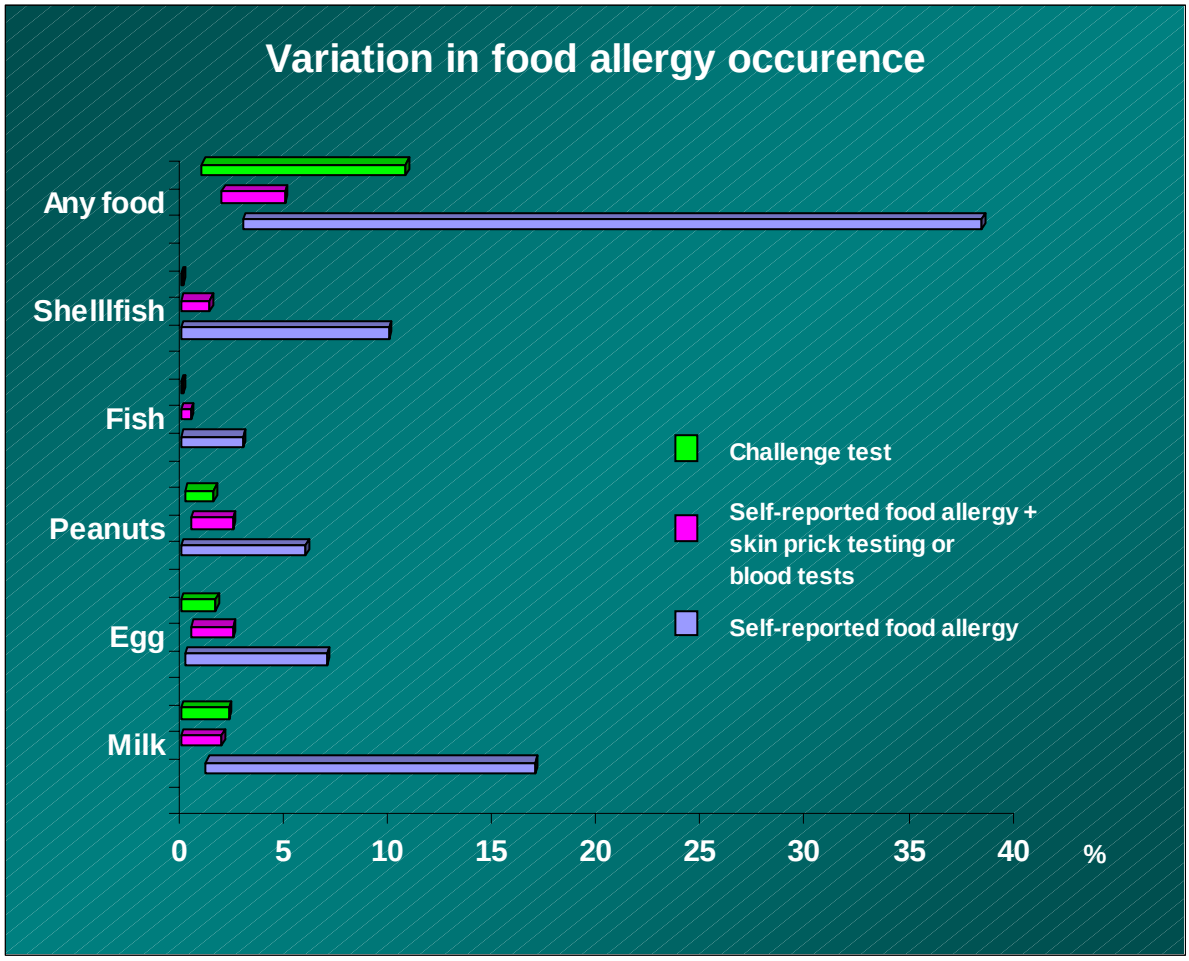
When medical specialists diagnose food allergies they will as a first step talk with and examine the patient for signs of allergic symptoms. This information will help the specialists decide which tests are appropriate. The first test is usually a test for the detection of IgE antibodies to different foods. Normally we produce IgE antibodies to fight infections caused by parasites. In some people for yet not known reasons the immune system produce IgE antibodies to harmless things like foods. **Skin prick testing** and **blood tests** are the main tests used to detect food-specific IgE antibodies. The presence of IgE antibodies to a specific food indicates that this person may experience allergic symptoms when eating that particular food. However, it is possible to have specific IgE antibodies without developing symptoms. Therefore, it is normally necessary to perform a provocation or **challenge test** with the suspect food to confirm a food allergy. This involves introducing the food to the patient in gradually increasing amounts under controlled conditions. Many specialists believe that the challenge test is the gold standard to diagnose food allergy. Others may make a diagnosis based on convincing symptoms and a positive test for food-specific IgE antibodies as it is not always feasible to use the challenge test. Different kinds of skin prick and blood tests exist, and the food challenge test may be performed in different ways in different studies. These factors explain the huge diversity of study designs to assess the percentage of people with food allergy.

**How common is food allergy?**

This is a question that it is very difficult to answer because different studies provide different results due to the diversity in study designs.

Recently, researchers in EuroPrevall, which is an EU-funded project about food allergy, looked at more than 900 published studies to assess the percentage of people with food allergy in the community. More than 120 foods have been described as causing food allergies, but only a limited number of those cause most allergic reactions. Only 51 studies assessed food allergy in a representative sample of a population and could therefore be used to estimate the percentage of people with food allergy. The studies included were those reporting percentages for allergy to any food. In addition the researchers included studies specifically on allergy to milk, egg, peanut, fish, and shellfish. These foods were chosen because they had the highest number of studies. This increased the likelihood that it would be possible to calculate the percentage of people with allergy to these specific foods. Most of the studies were on self-reported food allergy to any food. In other studies the persons suspecting food allergy had their food allergy confirmed by challenge test or had a skin prick test or a blood test.

The diagram below illustrates the variations found in different studies. It can be seen that if people are asked in surveys if they have food allergies, 3 - 38% answer that they do although only few studies had figures above 20%. If those people who believe they have food allergy are challenged with the food that they think causes their allergy, only 1 - 11% have their food allergy confirmed. Most of the studies in which food allergy is clinically proven report percentages between 1 and 5 % of the total population as having any food allergy. So there is a large gap between the percentage of people who think they have a food allergy and the percentage of people who are diagnosed as allergic. In general, the same effect is apparent when specific foods are investigated - self-reported food allergy is overestimated compared to clinically proven food allergy.




**Results from recent EuroPrevall analysis. The bars show the span between different studies from the lowest to the highest percentage of people with food allergy.**

The researchers analysed the studies to see if it would be possible to combine the results of the different studies and make an estimation of the overall percentage of people with food allergy in the community. The analysis showed that the results between the studies varied so much that it was not meaningful to combine the results and calculate either the overall proportion of people with food allergy or the proportion with allergy to the specific foods.

One explanation for the large variation is that there are real differences between countries, and not just differences because of the way the studies were designed. One study in 15 different countries (using the same method) showed a variation in self-reported food allergy from 4.6-18 %. This would indicate real differences between countries. However, another explanation for the large variation might be that most of the studies used different methods to diagnose food allergy and had different response rates.

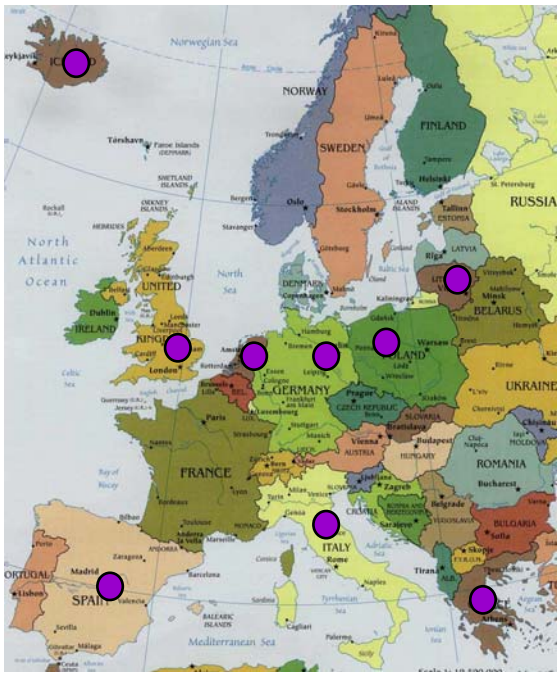
In addition to what can be seen from the diagram, the researchers found that milk and egg allergy tend to be more common among 0-4 year old children. This is in line with the clinical experience that many children outgrow allergy to milk and egg.

The recent analysis points to the need for researchers to use the same method for diagnosis of food allergy in order to use the results to estimate the percentage of people with food allergy in the community and look at possible regional differences.

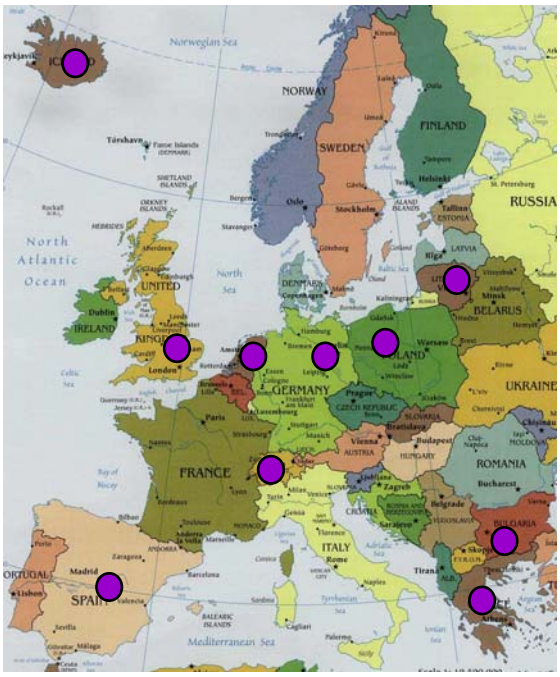
**Research within EuroPrevall on the percentage of people with food allergy in the community**

A main objective of EuroPrevall is to establish the true percentage of infants, children and adults with food allergies across Europe.

More than 8500 newborns from 9 different countries in Europe will participate in a study that will investigate the occurrence of food allergies in the first 2½ years of life. The researchers will interview the mothers regularly. They will conduct allergy testing if a child shows symptoms of a possible food-related allergy. The 9 different countries participating in the study cover a range of different cultures and climates. The researchers will see if the occurrence of food allergy is the same in all countries. If differences do exist the researchers will explore whether the differences can be explained by, for example, different eating habits or pollen exposure. The EuroPrevall study with newborns is the most comprehensive investigation of food allergies in the first years of life to date.




**Countries in the newborn study**




**Countries in the study of children and adults**

Additionally, about 30,000 school-age children and adults from 10 European countries will participate in a community survey. As for the study with newborns, the researchers aim to determine the percentage of children and adults with different kinds of food allergy. The study with school-age children will take place in schools, where the researchers will ask the children about symptoms that may be related to food allergy using a questionnaire. The researchers will conduct allergy testing in an allergy clinic for those children showing symptoms of a possible food-related allergy. The researchers will identify adults for the study, for example, by using lists of patients from general practitioners.

When the results of these studies are available in a few years' time, we should have a much clearer picture of the true percentage of people with food allergy in the general population and the differences that may exist across Europe.

The above text is based on the paper:

R.J. Rona, T. Keil, C. Summers, D. Gislason, L. Zuidmeer, E. Sodergren, S.T. Sigurdardottir, T. Lindner, K. Goldhahn, J. Dahlstrom, D. McBride, C Madsen (2007). The prevalence of food allergy: A meta-analysis. J Allergy Clin Immunol 120(3), 638-646.

*EuroPrevall is an EU-funded project about food allergy. The primary objective of EuroPrevall is to improve the quality of life for all food allergic consumers. To meet that objective EuroPrevall will conduct research to obtain information that we currently lack. EuroPrevall will also develop the tools necessary to manage food allergies more effectively. The 63 partners from 25 different countries include some of the leading allergy research organisations in Europe as well as clinical, patient, and industrial organisations. Visit www.europrevall.org for more information on the project.*