

Public perception of food allergy

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Background: Although studies that use the double-blind placebo-controlled food challenge suggest that the prevalence of food allergy is about 2%, public belief in food allergy appears to be considerably higher.

Objective: The study was undertaken to determine the magnitude and features of the American public's belief in food allergy by surveying a large, demographically balanced population.

Methods: A simple question about food allergy was incorporated into a broad, self-reported, mailed consumer questionnaire. Five thousand demographically representative American households were surveyed by means of quota sample in 1989, 1992, and 1993.

Results: The response rates were 79%, 75%, and 74%, respectively. Of responding households, 16.2%, 16.6%, and 13.9%, respectively, reported an average of 1.17 household members with food allergy. Individuals reported to be allergic to foods were more likely to be female, particularly adult women. Male individuals with reported food allergy tended to be young, whereas no such skew was noted among female subjects. Geographic differences were observed in reported food allergy, with the highest rate in the Pacific region. Milk and chocolate were the individual foods most frequently implicated in food allergy. Trends were consistent over the period studied.

Conclusions: Perceived food allergy is widespread and persistent. The characteristics and demographic patterns of this belief are not reflective of known food allergy epidemiology derived from studies in which the double-blind placebo-controlled food challenge is used. (*J Allergy Clin Immunol* 1996;97:1247-51.)

Key words: Food allergy, food hypersensitivity, food intolerance, allergy, epidemiology, prevalence, perception, diagnosis, self-diagnosis, consumer

The most reliable technique for confirming the diagnosis of food allergy is the double-blind placebo-controlled food challenge (DBPCFC). Studies that use the DBPCFC suggest that food allergy is relatively uncommon, affecting fewer than 2% of adults.¹ The prevalence of food allergy in children has been estimated at between 0.1% and 8%; most claims of food allergy could not be confirmed by DBPCFC.^{2,3} Even in a highly selected group of patients with a positive history of allergy, food allergy can be confirmed less than 40% of the time.²

Abbreviation used

DBPCFC: Double-blind placebo-controlled food challenge

Research suggests that the public's belief in food allergy is much higher than prevalence data support. Two studies done by the Good Housekeeping Institute addressed this issue. In 1984, 55 of 200 (27.5%) mothers with young children reported that one or more family members were allergic to food.⁴ In a 1989 study, 51 of 300 (17%) mothers reported problems with foods or food additives in their household.⁵ Nearly three quarters of these mothers made changes in their family's eating habits, most without any professional diagnosis or recommendation, demonstrating that the mere perception of food allergy is sufficient to influence eating behavior. These studies were limited by the

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ABOUT FOOD ALLERGIES		
1. Does anyone in your household have a food allergy		
Yes ☐ 8-1 No ☐ 2 → (Go to the next section)		
If "Yes", let me know their age and sex, as well as their allergy:		
Age	Sex	Describe allergy(s) such as milk, shellfish, peanuts, etc.
_____	1 2 M ☐ F ☐	_____
		9-13
_____	1 2 M ☐ F ☐	_____
		14-18
_____	1 2 M ☐ F ☐	_____
		19-23

FIG. 1. Food allergy question incorporated into a broad consumer questionnaire.

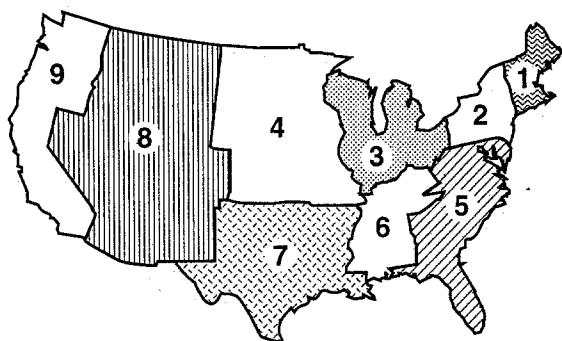


FIG. 2. Geographic regions of the United States.

small numbers of subjects chosen from the magazine's readership.

The food allergy perception/reality disparity is not a peculiarly American phenomenon. When a random sample of 1483 Dutch adults was polled, 12.4% claimed to have food allergy.⁶ Food allergy was confirmed by DBPCFC in only 12 of 73 subjects who completed the protocol. This indicated a probable 2.4% prevalence of true food allergy in the Dutch adult population, assuming that allergy was equal in participants, nonparticipants, and dropouts. In response, the Dutch government created a national information bureau to focus on public education about food allergy and intolerance.

A food allergy questionnaire was sent to 15,000 British households, half chosen from the electoral registers and half from the Wycombe Health Au-

thority. This represented an estimated 20,000 individuals. The overall response rate was 47%. Of the subjects who responded initially, 19.9% reported food allergy. Of 93 subjects undergoing DBPCFCs, 18 (19.4%) had positive test responses to the suspected foods. A second, briefer survey elicited additional responses from those households that did not initially respond to the original food allergy survey. The response rate to the second survey was 17.4%, with 6.4% reporting food allergy, none of whom were challenged. Assuming that this second group would also have a 19.4% positive challenge rate and making corrections for those who did not respond to any survey, the investigators estimated a 1.4% to 1.7% prevalence of food allergy in the British population.⁷ In both European studies, women had a higher prevalence of self-reported food allergy and, in the British study, confirmed food allergy as well.

This study was undertaken to determine the magnitude and features of the American public's belief in food allergy by surveying a large, demographically balanced population.

METHODS

A short, simple question about food allergy (Fig. 1) was incorporated into a broader, self-reported, mailed consumer questionnaire administered by the NPD Group of Marketing and Research Companies (Port Washington, N.Y.) in May 1989, June 1992, and June 1993.

The technique used was a quota sample, a type of nonprobability sample. Quota samples are used to poll a

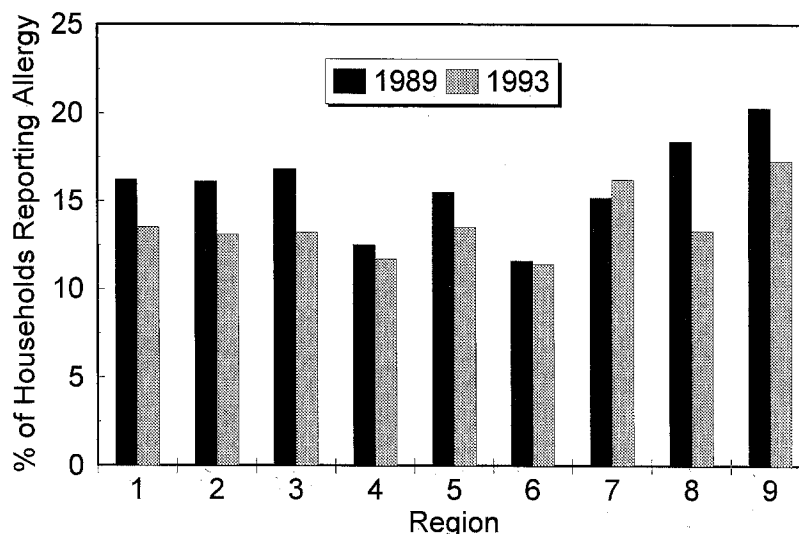


FIG. 3. Percentage of households in each geographic region reporting at least one individual with food allergy.

survey population that is representative, with respect to certain defined characteristics, of the population at large. This study population was constructed to represent the demographics of the United States. Unlike random probability samples, quota samples are not subject to standard statistical tests. Despite this, quota samples are a valid technique, widely used by the market research industry.

For each of these quota samples, a different representative group of 5000 American households was surveyed. The demographic factors (quotas) controlled for were household size, household income, age of householder, household socioeconomic status, education of householder, and population density within each geographic region, as determined by the US Bureau of the Census.⁸ These characteristics were chosen because they are considered to be the best predictors of consumer behavior.⁹ Known group response rates were considered in the panel design so that the demographic characteristics of respondents would reflect the demographics of the U.S. population at large.

RESULTS

Of the 5000 households polled in 1989, 1992, and 1993, the response rates were, respectively, 79%, 75%, and 74%. Overall 16.2%, 16.6%, and 13.9%, respectively, of responding households reported at least one individual in the home with a food allergy. Each household with perceived food allergy reported an average of 1.17 allergic individuals.

When viewed by region of the United States (Fig. 2), geographic differences were apparent in the percentages of households reporting individuals with food allergy (Fig. 3).

Twice as many female subjects as male subjects reported food allergy in all years of the study.

Fig. 4 shows the age distribution of individuals reported as having food allergy in 1993. The distribution among male subjects was skewed toward younger individuals; this age predilection was not apparent among female subjects. These patterns were consistent over the 4-year period.

Table I shows the foods implicated as being responsible for the reported food allergies.

DISCUSSION

This study indicates that many more Americans believe they are allergic to food than supported by prevalence data. In addition, demographic trends and specific food-related beliefs were noted, which are not reflected in the scientific literature. These trends were remarkably consistent over the period studied and are comparable to findings in other countries.

Although true food allergy is more common in children, those individuals reporting food allergies are most likely to be adult women. It is interesting to look at the individual foods most frequently reported as the offending agents: milk and chocolate. Although cow's milk is known to be the most common food allergen in young children,¹⁰⁻¹² chocolate has not been shown to be a common cause of allergic reactions, as confirmed by DBPCFC.

Although the unconfirmed belief in food allergy appears to have decreased, its prevalence remains high. According to US Census data, there are 92,830,000 households with a total population of

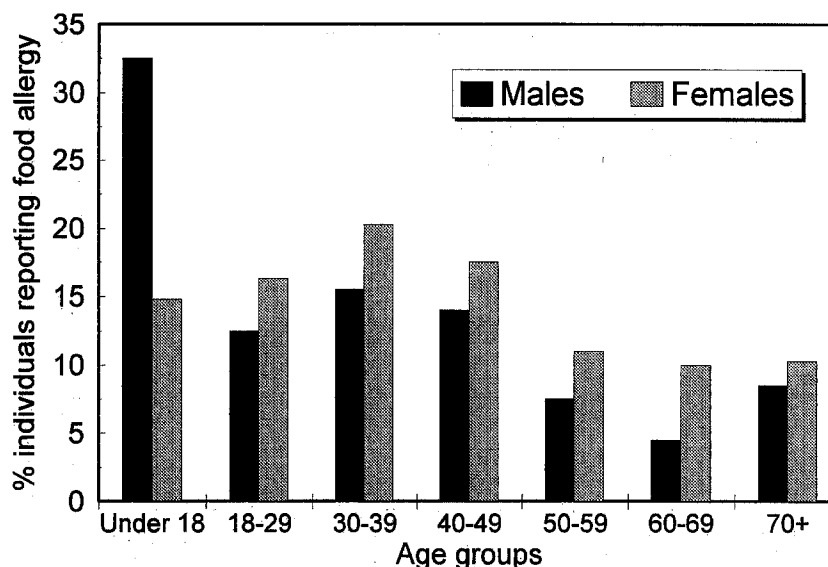


FIG. 4. Age distribution of individuals identified as allergic to food in 1993.

TABLE I. Foods indicated as responsible for reported allergy

Food	Percentage of individuals reporting food allergy	
	1989	1993
Milk	29.3	30.7
Fruit	19.7	21.8
Vegetables	19.9	19.2
Seafood/shellfish	16.9	16.5
Dairy products (except milk)	10.2	9.7
Chocolate	11.1	8.3
Eggs	6.8	7.2
Peanuts	5.5	7.2
Meat/poultry	6.7	4.7
Nuts	3.3	4.5
Fish	4.1	3.2
Wheat	3.7	3.0
Monosodium glutamate	1.7	2.7
Yeast	1.1	1.2
Spices/seasonings	2.0	1.2
Food dyes/colorings	1.6	1.2
Caffeine	1.1	1.2
Sugar	1.7	1.0
All others	3.4	1.8

248,709,873. If our survey results are extrapolated to the American public at large, then more than 15 million Americans may believe they are allergic to food.

We can speculate as to why such a great dispar-

ity exists between confirmed and perceived food allergy. Widespread reliance on history and skin test and RAST results as the sole indicators of food allergy overestimates prevalence.^{13, 14} "Food allergy" may be more acceptable to the patient than a more serious medical or psychiatric diagnosis. The term "pseudo-food allergy" was coined to indicate the unsupported but firm belief in food allergy.¹⁵ Social and cultural habits and attitudes may also be factors in the prevalence of food-related symptoms.¹⁶ Practitioners of "alternative" techniques, consulted by 34% of Americans,¹⁷ receive extensive media attention and may reinforce unproven beliefs in food allergy by offering "cures."¹⁸

Although confirmed food allergy is uncommon, perceived food allergy is a widespread and persistent international problem with significant consequences. Belief in food allergy can lead to potentially deleterious dietary manipulation or may delay a more appropriate diagnosis and treatment.^{19, 20} It has been well documented that unnecessarily restrictive diets, based on the unsupported belief in food allergy, can lead to malnutrition and even death.²¹⁻²⁴ A patient's history of food allergy, particularly when used as an explanation for chronic, vague, or psychologic symptoms, should not be taken at face value. It should prompt the clinician to confirm the diagnosis by means of a blinded food challenge or to search for another explanation for the patient's symptoms. Self-diagnosis and empirical treatment should be avoided.

Although the organized allergy profession is making attempts to educate the public about food allergy,²⁵ such efforts do not appear to be making significant advances in counteracting the effect of forces promoting the unsupported belief in food allergy. Perhaps it is time for American allergists to follow the Dutch example and mobilize a nationwide approach to food allergy education.

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