

# Epidemiology of Food Allergic Reactions in Restaurants

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## BACKGROUND

Severe and sometimes fatal allergic reactions occur in restaurants. Despite this, there are few policies in the United States mandating formalized training of restaurant staff on food allergic issues. Moreover, declaration of allergenic ingredients in meals is not compulsory in food-serving establishments.

The present study sought to characterize food allergic reactions in restaurants to better inform the food allergic individual, physician providing counseling on dining out, and restaurant industry.

## METHODS

De-identified self- and parental-reported data from September 2017 to September 2019 from the Food Allergy Research & Education (FARE) IRB-approved Food Allergy Patient Registry were reviewed. Demographics, location of most recent allergic reaction, type of food-serving establishment, implicated food, and treatment received were analyzed. Descriptive statistics were used.

## RESULTS

Allergic reactions were reported for 2827 individuals from the United States (1579 children <18 years, 40% female; 1248 adults, 82% female). For both children and adults, dining out was the second most common location for these reported allergic reactions (n=597, 21%, most common being one's home (44%). Demographics of survey respondents reporting the reactions while dining out are shown in Table 1. Cafes (15%), fast food restaurants (10%), ice cream parlors (7%), and Asian restaurants (7%) were the most frequently identified food-serving establishments where children experienced an allergic reaction (Figure 2A). Cafes (18%), fast food restaurants (10%), Asian restaurants (10%), and bars (7%) were the most often cited locations for allergic reactions in adults (Figure 2B).

The most common food allergens that caused an allergic reaction for both children and adults while dining out were peanut, tree nuts, and milk (Figure 3). Shellfish were also a common food trigger in adults while dining out.

## RESULTS

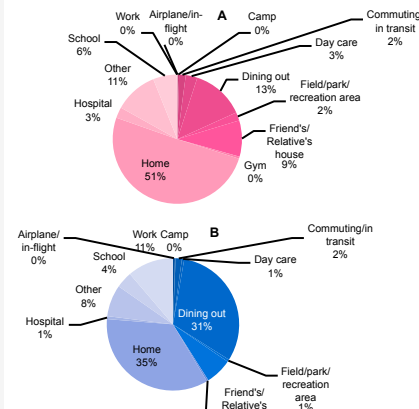


Figure 1. Most recent location for allergic reaction. (A) Children < 18 years. (B) Adults ≥ 18 years. Other refers to unsure or no response.

	CHILDREN n	%	ADULTS n	%
<b>GENDER</b>				
Male	119	56.9%	68	17.5%
Female	30	43.1%	320	62.5%
Total	209		388	
Average Age	11.09		42.28	
<b>RACE</b>				
American Indian or Alaska Native	5	2.1%	5	1.2%
Asian	24	9.9%	25	6.1%
Black	13	5.4%	18	4.4%
White	197	81.1%	362	87.9%
Native Hawaiian or Other Pacific Islander	3	1.2%	1	0.2%
Unknown	1	0.4%	1	0.2%
<b>ETHNICITY</b>				
Hispanic or Latino	14	6.7%	20	5.2%
Non Hispanic or Latino	153	73.2%	258	66.5%
Unknown	42	20.1%	110	28.4%

Table 1. Demographics of survey respondents.

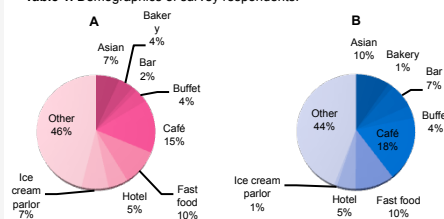


Figure 2. Type of food-serving establishment in which allergic reaction occurred. (A) Children < 18 years. (B) Adults ≥ 18 years.

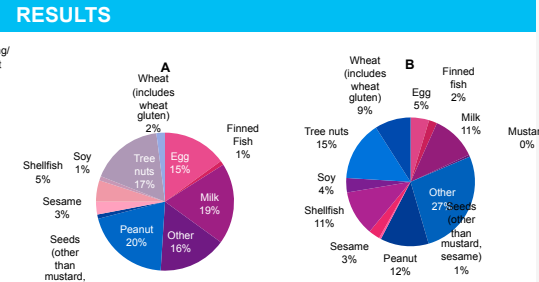


Figure 3. Food allergens that caused an allergic reaction while dining out. (A) Children < 18 years. Other refers to fruits, vegetables, herbs or spices, or unspecified by survey respondent. (B) Adults ≥ 18 years. Other refers to fruits, vegetables, herbs or spices, cereals and grains other than wheat, beans, legumes, or pulses other than soy, meats, non-food items, or unspecified by survey respondent.

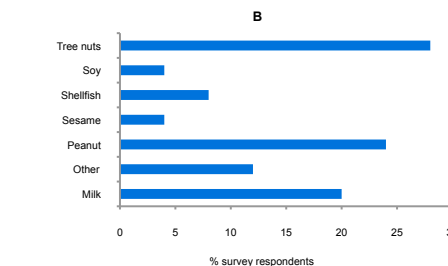
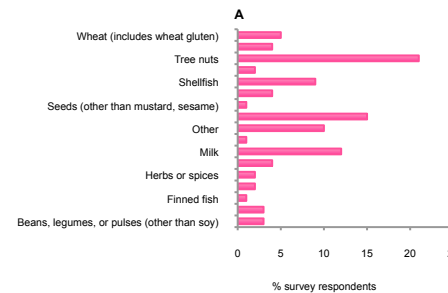


Figure 4. Foods that required epinephrine. (A) Use of one dose of epinephrine reported. (B) Two doses of epinephrine used.

## RESULTS

Of those who had a reaction while dining out, restaurant staff were informed of the food allergy 38.0% of the time. A list of ingredients (5.0%), allergens (9.2%), and/or precautionary statement (3.5%) was included on the menu in a minority of cases.

In some instances, reactions were severe requiring epinephrine (28.0%). In 6.2% of cases, 2 doses of epinephrine were used. Food allergic individuals were admitted to the hospital in 6.2% of cases and 1.8% were admitted to the ICU. The most common food allergens that necessitated one or two doses of epinephrine were tree nuts, peanut, and milk (Figure 4).

## CONCLUSIONS

Although dining out at restaurants contributes substantially to the morbidity of food allergic individuals, formal procedures in restaurants aimed at preventing and treating allergic reactions and governmental oversight in the form of legislation are lacking.

The second most common location for allergic reactions are restaurants and those reactions can be severe. Data shown here using the Food Allergy Patient Registry from FARE apprises physicians, food allergic individuals, and restaurant staff of circumstances surrounding food allergic reactions. Individuals with allergies to milk, peanut, or tree nuts are at highest risk. Factors such as food allergic individuals not informing restaurant staff of an allergy and absence of information on menus regarding allergens contribute to the considerable number of allergic reactions in food-serving establishments.

Current knowledge of food allergic reactions in restaurants is essential before advocating for policies relating to food allergen labeling on restaurant menus and mandatory training for restaurant staff. This data will inform families and physicians on best practices for dining out at restaurants with the goal of improving the quality of life of food allergic individuals.

## REFERENCES

- Furlong TJ, et al. J Allergy Clin Immunol 2008;121(Suppl 1):S248.
- Furlong TJ, et al. J Allergy Clin Immunol 2001;108: 867-70.
- Bock SA, et al. J Allergy Clin Immunol 2001;107:191-3.
- Bock SA, et al. J Allergy Clin Immunol 2007;119:1016-8.
- Carter CA, et al. J Allergy Clin Immunol Pract 2020;8:70-4.