Online Supplement:

NHANES:

The National Health and Nutrition Examination Surveys (NHANES) are designed to assess the health and nutrition of children and adults in the United States. Since 1999, NHANES has been conducted continuously in 2-year blocks. The survey examines a nationally representative sample of approximately 5000 individuals from 15 counties across the United States each year. Interviews are initially conducted in subject's homes, followed by physical exams in mobile centers. In the 2007-2010 surveys, non-Mexican Hispanics were oversampled in order to provide sufficient power for subgroup analyses. There was an 80% response rate among those interviewed, and sample weights were applied to produce an unbiased national estimate. The NHANES was approved by the IRB of the National Center for Health Statistics, and all subjects provided informed consent.

Methods:

Self-reported food allergy was compared to recent ingestion of milk, fish, shellfish, and peanut. Thirty-day consumption of foods was asked for milk, shellfish and fish, but not for the other allergens queried in the food allergy questionnaire. Twenty-four hour consumption of peanut was extracted from the detailed food diary as outlined below. For milk, subjects were initially asked the question, "In the past 30 days, how often did you have milk to drink or on your cereal?" If they answered affirmatively ("rarely," "sometimes," "often," "varied"), they were then asked, "What type of milk was it?" Subjects were classified as "drinking milk" if they answered yes to whole milk, 2% milk, 1% milk, or fat free milk. Consumption was then compared to whether the subject reported a milk allergy in order to determine what percentage of those with self-reported

milk allergy were still consuming the food. Shellfish ingestion was similarly ascertained by the question, “During the past 30 days, did you eat any types of shellfish listed on this card?” Subjects were included in the analysis of the percentage of individuals with a self-reported shellfish allergy who were still consuming the food if they answered yes to eating crabs, crayfish, lobster, or shrimp. For fish, subjects were asked, “During the past 30 days, did you eat any types of fish listed on this card?” and were included if they endorsed eating breaded fish, tuna, bass, catfish, cod, flatfish, haddock, mackerel, perch, pike, pollock, porgy, salmon, sardines, sea bass, shark, swordfish, trout, or walleye. Finally, subjects were interviewed in person to report the type and amount of food and beverages they consumed 24 hours prior to the interview (midnight to midnight). Peanut-containing foods were identified in the NHANES list of possible participant responses. Subjects who recorded eating these peanut-containing foods were identified and included in the analysis of those with self-reported peanut allergy who were still consuming the food. Further analyses excluded subjects who reported allergy to a food but also reported consuming it either in the past 30 days (milk, fish, shellfish) or 24 hours (peanut).

Education level was assessed by the following question to the household representative, “What is the highest grade or level of school you have received?” and was dichotomized as less than or greater than the median value, which was attending college. Income level was assessed as a ratio of family income to poverty threshold and was dichotomized as less than or greater than/equal to the median value of 1.75. The categories of self-reported race/ethnicity were Mexican American, Other Hispanic, Non-Hispanic White, Non-Hispanic Black, and other race, including multi-racial. For analyses, Mexican American and Other Hispanic were combined.

The presence of asthma was assessed by a positive response to the question, “Has a doctor or other health professional ever told you that you have asthma?” and allergic rhinitis was a

positive response to, “During the past 12 months, have you had an episode of hay fever?” Asthma severity was further characterized by participant responses to the questions: a) “Do you still have asthma?” b) “During the past 12 months, have you had an episode of asthma or an asthma attack?” and c) “During the past 12 months, have you had to visit an emergency room or urgent care center because of asthma?”

Multivariable logistic regression, stratified by age, was performed to assess the relationship between food allergy and demographic and clinical characteristics. Multivariable models were adjusted for gender, race/ethnicity, education, income, allergic rhinitis, and asthma. A two-tailed p value of < 0.05 was considered statistically significant.

E1. NHANES 2007-2008 prevalence of self-reported specific food allergies

	Children	Adults	Total Study Population
Milk	2.39 (1.48 – 3.30)	2.70 (1.88 – 3.53)	2.63 (2.03 – 3.23)
Shellfish	0.77 (0.21 – 1.33)	2.09 (1.68 – 2.50)	1.77 (1.47 – 2.08)
Peanut	1.42 (0.90 – 1.94)	1.06 (0.59 – 1.53)	1.15 (0.77 – 1.52)
Tree Nuts	0.56 (0.17 – 0.96)	0.96 (0.48 – 1.43)	0.86 (0.51 – 1.21)
Egg	0.41 (0.07 – 0.75)	0.54 (0.34 – 0.75)	0.51 (0.34 – 0.68)
Wheat	0.32 (-0.01 – 0.66)	0.74 (0.42 – 1.05)	0.64 (0.39 – 0.89)
Fish	0.53 (-0.05 – 1.10)	0.43 (0.27 – 0.60)	0.46 (0.27 – 0.65)
Soy	0.37 (0.14 – 0.59)	0.34 (0.10 – 0.58)	0.34 (0.14 – 0.55)
Corn	0.51 (0.13 – 0.88)	0.27 (0.05 – 0.48)	0.33 (0.13 – 0.52)
PN/TN	1.65 (1.13 – 2.17)	1.67 (0.96 – 2.38)	1.66 (1.11 – 2.22)
PN/TN/SF	2.18 (1.50 – 2.86)	3.37 (2.61 – 4.13)	3.09 (2.48 – 3.70)
PN/TN/SF/F	2.35 (1.61 – 3.10)	3.55 (2.73 – 4.37)	3.27 (2.61 – 3.92)
Other	3.22 (2.44 – 4.01)	4.81 (4.06 – 5.56)	4.43 (3.85 – 5.01)
All Foods	7.02 (5.73 – 8.31)	10.0 (8.72 – 11.4)	9.32 (8.24 – 10.4)

Values reported as % (95% CI)
PN = peanut; TN = tree nuts; SF = shellfish; F = fish

E2. NHANES 2009-2010 prevalence of self-reported specific food allergies

	Children	Adults	Total Study Population
Milk	1.49 (0.98 – 2.01)	2.58 (1.97 – 3.19)	2.32 (1.81 – 2.83)
Shellfish	0.96 (0.63 – 1.29)	1.99 (1.42 – 2.56)	1.75 (1.27 – 2.22)
Peanut	0.90 (0.43 – 1.37)	0.72 (0.38 – 1.06)	0.76 (0.45 – 1.08)
Tree Nuts	0.48 (0.09 – 0.87)	0.78 (0.51 – 1.05)	0.71 (0.48 – 0.93)
Egg	0.86 (0.55 – 1.17)	0.48 (0.26 – 0.69)	0.57 (0.39 – 0.75)
Wheat	0.25 (0.07 – 0.43)	0.51 (0.21 – 0.82)	0.45 (0.23 – 0.67)
Fish	0.33 (0.08 – 0.57)	0.49 (0.27 – 0.71)	0.45 (0.31 – 0.59)
Soy	0.14 (0.04 – 0.24)	0.36 (0.06 – 0.66)	0.31 (0.08 – 0.54)
Corn	0.06 (-0.04 – 0.17)	0.18 (0.00 – 0.35)	0.15 (0.01 – 0.28)
PN/TN	1.20 (0.57 – 1.84)	1.27 (0.86 – 1.68)	1.26 (0.84 – 1.67)
PN/TN/SF	1.95 (1.30 – 2.60)	3.15 (2.54 – 3.76)	2.86 (2.32 – 3.40)
PN/TN/SF/F	2.23 (1.50 – 2.97)	3.44 (2.81 – 4.07)	3.15 (2.61 – 3.69)
Other	2.44 (1.66 – 3.22)	4.18 (3.56 – 4.80)	3.76 (3.24 – 4.29)
All Foods	6.05 (4.83 – 7.27)	9.40 (8.43 – 10.4)	8.60 (7.80 – 9.39)

Values reported as % (95% CI)
PN = peanut; TN = tree nuts; SF = shellfish; F = fish

Table E3: Relationship between demographic and clinical characteristics and self-reported food allergy*

	Children		Adults	
	OR (95% CI)	p value	OR (95% CI)	p value
Female	1.25 (0.73 – 1.59)	0.08	1.35 (1.14 – 1.59)	0.001
Race/Ethnicity				
Caucasian	1 (REF)		1 (REF)	
Hispanic	0.94 (0.69 – 1.28)	0.67	1.12 (0.89 – 1.39)	0.32
Black	1.31 (0.93 – 1.83)	0.12	1.28 (1.06 – 1.53)	<0.01
Other	1.54 (0.97 – 2.46)	0.07	1.01 (0.63 – 1.48)	0.94
College Education	1.12 (0.79 – 1.60)	0.52	1.46 (1.18 – 1.82)	0.001
Income > 1.75 x PL	1.04 (0.84 – 1.29)	0.70	1.03 (0.91 – 1.17)	0.65
Asthma	2.76 (2.02 – 3.75)	<0.001	1.87 (1.56 – 2.24)	<0.001
Allergic Rhinitis	1.85 (1.42 – 2.40)	<0.001	2.11 (1.71 – 2.61)	<0.001

Values reported as adjusted odds ratios (95% CI)
PL = poverty level
* Adjusted for gender, race/ethnicity, education, income, asthma, and allergic rhinitis

E4. Prevalence of self-reported food allergy by asthma indicator*

	Children	p value	Adults	p value	Total Study Population	p value
No asthma	5.19 (4.54 – 5.92)	<0.0001	8.55 (7.80 – 9.36)	<0.0001	7.76 (7.15 – 8.42)	<0.0001
"Ever been told you have asthma?"	7.40 (4.60 – 11.6)		13.6 (10.7 – 17.1)		12.2 (9.94 – 14.8)	
"Still have asthma?"	15.2 (10.7 – 21.2)		16.7 (12.8 – 21.6)		16.3 (13.0 – 20.3)	
"Had asthma attack in the past year?"	19.9 (13.0 – 29.3)		24.8 (19.0 – 31.6)		23.1 (19.1 – 28.3)	
"Emergency care visit for asthma in the past year?"	21.6 (13.9 – 32.0)		19.3 (12.5 – 28.7)		20.1 (14.7 – 26.9)	

Values reported as % (95% CI)
* P value obtained by test for trend