

Racial Disparities in Food Allergy Anaphylaxis Education and Management among a Nationally Representative Sample

S Klein¹, E Brown², D Gardner³, H Jaffee⁴, E Malawer⁵, E Martinez², T Silvera⁶, A Roach¹

¹Food Allergy Research & Education, Mclean, VA, ²Food Equality Initiative, ³Allergy & Asthma Network, ⁴Asthma & Allergy Foundation of America, ⁵AllergyStrong, ⁶Elijah-Alavi Foundation



BACKGROUND

Substantive racial and economic disparities exist in food allergy (FA), a potentially life-threatening disease effecting around 32 million Americans.^{1,2,3}

- Black Americans are significantly more likely than White Americans to have FA.^{1,3}
- Black and Hispanic children are also at higher risk of adverse outcome from FA (like emergency department visits and anaphylaxis) than White children.⁴
- Low-income children incur around 2.5 times the number of FA-related emergency department visits than higher-income children.⁴

More data are needed to evaluate disparities in access to high-quality medical care and effective daily management.

METHODS

SURVEY DEVELOPMENT

This online, IRB-exempt survey was developed by a multidisciplinary team of patient advocacy groups, physicians, caregivers, and survey methodologists.

SURVEY ADMINISTRATION

A nationally representative sample of adults with FA was recruited by Evaluative Criteria Inc. in May 2022. Only adults who reported a multi-system reaction suggestive of anaphylaxis to a top-nine allergen completed the survey.

RESULTS

DEMOGRAPHICS

Surveys were completed by N=1,006 adults with FA. Gender skewed toward female (61.2%), with 37.3% identifying as Male, and 1.5% selecting other responses, including “Non-binary” and “Prefer not to answer.” The sample included 41.3% ages 18 to 34, 30.2% ages 35 to 49, 18.8% ages 50 to 64, and 9.7% 65 or older. (Table 1)

The largest ethnic/racial category in the sample was Caucasian (60.5%), followed by African-American (16.3%) and Hispanic (15.4%). Asian, Native American and other responses represented 7.2% of the sample. (Table 1)

ANAPHYLAXIS HISTORY

Overall, 55.3% of survey respondents reported a lifetime history of food-induced anaphylaxis, with no meaningful differences between Caucasians (54.2%) and African-Americans (52.4%). (Figure 1)

45.7% of those with a history of anaphylaxis reported having had an anaphylactic reaction to a food which had been “eaten safely in the past.” Again, no meaningful differences appear between Caucasians (46.4%) and African-Americans (44.2%). (Figure 2)

A smaller percentage (32.2%) reported having had an anaphylactic reaction to a food which had in the past caused only mild symptoms. The difference between Caucasians (25.8%) and African-Americans (39.5%) reporting an anaphylactic reaction to a food which had been eaten with only mild symptoms in the past is meaningful ($p < .05$). (Figure 2)

RESULTS

Table 1. Sample Demographics

GENDER	%
Male	37.3
Female	61.2
All Other Responses	1.5
AGE	%
18-34	41.3
35-49	30.2
50-64	18.8
65+	9.7
RACE	%
Caucasian	60.5
African-American	16.3
Hispanic	15.4
All Other Responses	7.2



Figure 3. To the best of your knowledge, which of the following can be a sign of anaphylaxis requiring emergency treatment?

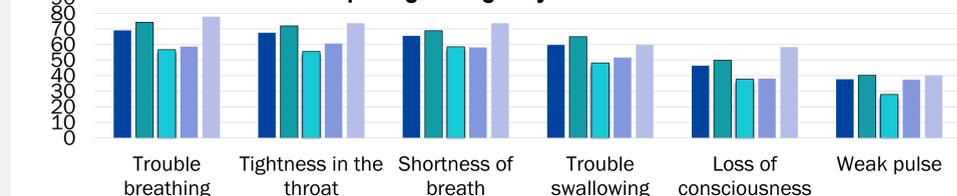


Figure 5. To the best of your knowledge, if a food allergic person begins to show symptoms of anaphylaxis,* from the list below, which of the following should be done first?

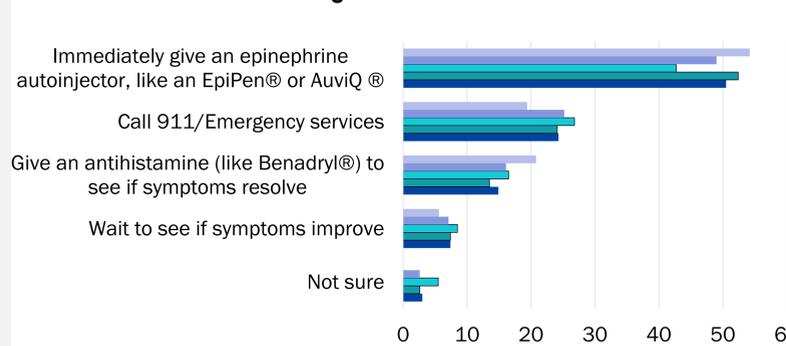


Figure 2. Have you ever had an anaphylactic* or severe allergic reaction to an ingredient you had eaten safely or that caused only mild reactions in the past? (Among Those Who Reported A History of Anaphylaxis, n=556)

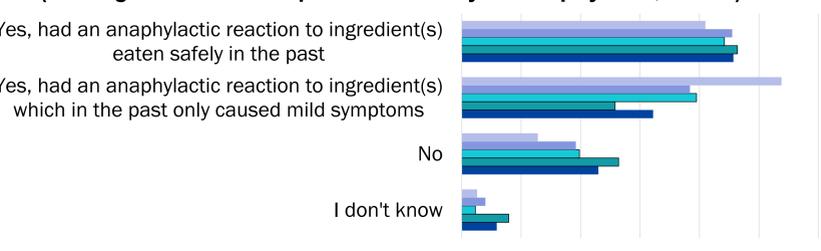


Figure 4. Do you have an epinephrine autoinjector?

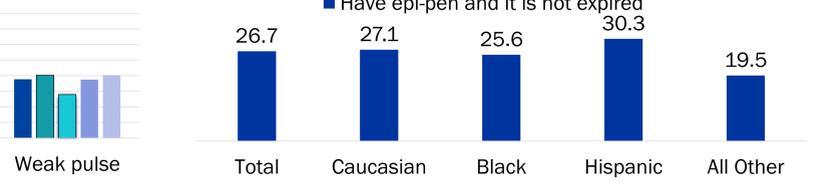


Figure 6. Thinking of the most recent time you began to show symptoms of anaphylaxis*, which of the following best describes what you did first? (Among Those Who Reported A History of Anaphylaxis, n=556)

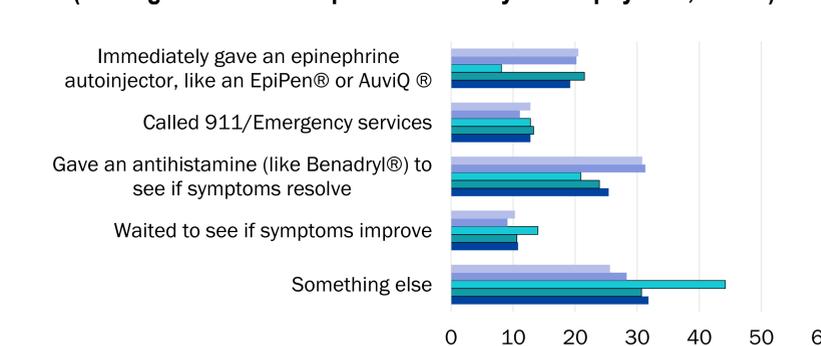
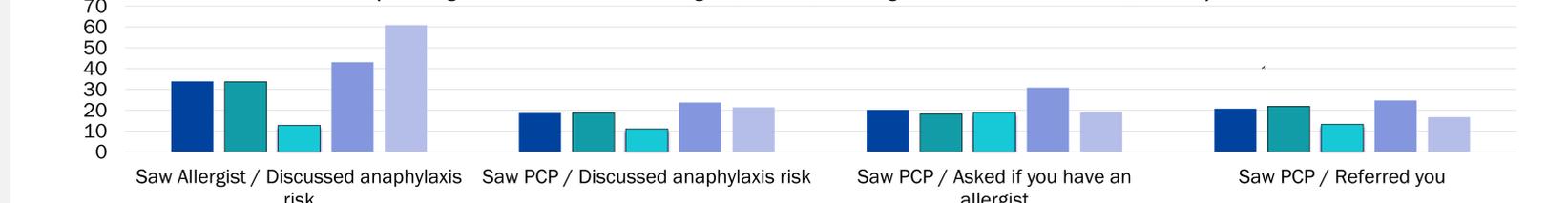


Figure 7. For each of the health care providers you have seen in the past 12 months, please indicate whether they have done the following at your visits. (Among Those Who Saw Allergist, n=316; Among Those Who Saw PCP, n=653)



*Definition provided to respondents: An anaphylactic reaction or severe allergic reaction is one where blood pressure drops suddenly and/or airways narrow, blocking breathing. Other symptoms can include wheezing, a rapid, weak pulse, and/or a skin rash combined with nausea and vomiting.
 1. Gupta RS, Warren CM, Smith BM, Jiang J, Blumenstock JA, Davis MM, Schleimer RP, Nadeau KC. Prevalence and Severity of Food Allergies Among US Adults. JAMA Network Open 2019; 2(1):e185630.doi:10.1001/jamanetworkopen.2018.5630.
 2. United States Census Bureau Quick Facts (2015 and 2016 estimates).
 3. Gupta RS, Warren CM, Smith BM, Blumenstock JA, Jiang J, Davis MM, Nadeau KC. The public health impact of parent-reported childhood food allergies in the United States. Pediatrics. 2018 Dec 1;142(6).
 4. Bilaver LA, Kester KM, Smith BM, Gupta RS. Socioeconomic disparities in the economic impact of childhood food allergy. Pediatrics. 2016 May 1;137(5).
 5. 2021 U.S. Federal Poverty Guidelines. Department of Health and Human Services.

RESULTS

ANAPHYLAXIS AWARENESS

Compared to Caucasians, African-American respondents were significantly ($p < .05$) less likely to recognize symptoms of anaphylaxis. For example, 74.2% of Caucasians identified “trouble breathing” as a sign of anaphylactic emergency, compared to only 56.7% of African-Americans (Figure 3). Furthermore, 52.4% of Caucasians recognize that epinephrine should be used immediately when symptoms of anaphylaxis begin, compared to only 42.7% of African-Americans ($p < .05$) (Figure 5).

ANAPHYLAXIS BEHAVIORS

Among those who experienced an anaphylactic reaction, only 19.2% reported that their first action was to immediately give epinephrine. 21.5% of Caucasians reported doing so, compared to only 8.1% of African-American respondents ($p < .05$). The most common behavior for all groups was to use an antihistamine with no meaningful differences between Caucasians (23.9%) and African-Americans (20.9%). (Figure 6)

PHYSICIAN INTERACTIONS

African-Americans and Caucasians reported having seen a PCP and an Allergist for food allergy at mostly similar rates over the past year. However, among those seeing each practitioner type, African-Americans were substantially ($p < .05$) less likely to report their doctor discussed anaphylaxis risk and significantly ($p < .05$) less likely to say the PCP provided a referral. (Figure 7)

CONCLUSIONS

A gap appears in education about anaphylaxis among African-American adults with FA. This gap may be a driver of self-reported behaviors during the most recent episode of anaphylaxis, specifically, that African-American adults with FA are less likely to immediately use epinephrine, the only treatment which will stop an anaphylactic reaction. This finding is concerning given Caucasians and African-Americans report having a non-expired epinephrine autoinjector at similar rates.

African-Americans with FA are less likely to say HCPs, specifically Allergists and PCPs, discussed anaphylaxis risk at their visits. This difference may be responsible for the different behaviors taken during an anaphylactic episode, as well as the lack of awareness about anaphylactic symptoms.

Interestingly, African-Americans are *not* more likely than Caucasians to report an episode of anaphylaxis to a food which had been eaten safely in the past (a proxy for a new food allergy); however, African-Americans are more likely to report an anaphylactic reaction to foods which had in the past caused only self-reported mild symptoms. It is possible that, given differences in recognized symptoms of anaphylaxis, African-Americans are more likely to perceive warning signs of anaphylaxis as “mild” symptoms. It is also possible that there is a communication gap with HCPs when it comes to discussion of symptomatic food allergy reactions, anaphylactic or otherwise. A lack of awareness about the symptoms of anaphylaxis, exacerbated by lack of knowledge about how to treat an anaphylactic reaction, can only lead to disproportionately worse outcomes for African-Americans as compared to Caucasians. Efforts are needed to close the gap in anaphylaxis education between African-American and Caucasian FA adults.