

## Temporal trends and racial/ethnic disparity in self-reported pediatric food allergy in the United States

Corinne A. Keet, MD, MS<sup>\*,†</sup>; Jessica H. Savage, MD, MHS<sup>‡</sup>; Shannon Seopaul, BS<sup>\*</sup>; Roger D. Peng, PhD<sup>§</sup>; Robert A. Wood, MD<sup>\*</sup>; and Elizabeth C. Matsui, MD, MHS<sup>\*</sup>

<sup>\*</sup> Division of Allergy and Immunology, Johns Hopkins University School of Medicine, Baltimore, Maryland

<sup>†</sup> Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland

<sup>‡</sup> Division of Rheumatology, Immunology, and Allergy, Brigham and Women's Hospital, Boston, Massachusetts

<sup>§</sup> Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland

### ARTICLE INFO

#### Article history:

Received for publication October 18, 2013.

Received in revised form November 19, 2013.

Accepted for publication December 6, 2013.

### ABSTRACT

**Background:** The prevalence of food allergy is thought to be increasing, but data from the United States have not been systematically synthesized.

**Objective:** To summarize the data on prevalence of food allergy in the US pediatric population and to estimate the effects of time, race/ethnicity, and method of assessing food allergy on the estimated prevalence.

**Methods:** Embase, MEDLINE, bibliographies of identified reports, and data from publically available data sets were searched. Studies were limited to those in English with data from the general pediatric US population. Study synthesis was performed by meta-analysis and meta-regression to estimate the effect of study- and participant-level covariates. Meta-regression was limited to nationally representative surveys conducted by the Centers for Disease Control and Prevention.

**Results:** A total of 10,090 publications were identified, from which 27 different survey administrations, representing 452,237 children, were identified, covering the period of 1988 to 2011. Because of heterogeneity among surveys in the estimated food allergy prevalence, a summary estimate of food allergy prevalence was not possible. Meta-regression was performed using 20 of these surveys. Temporal trends were pronounced, with an estimated increased prevalence of self-reported food allergy of 1.2 percentage points per decade (95% confidence interval [CI], 0.7–1.6). The increase per decade varied by race/ethnicity: 2.1% among non-Hispanic blacks (95% CI, 1.5%–2.7%), 1.2% among Hispanics (95% CI, 0.7%–1.7%), and 1.0% among non-Hispanic whites (95% CI, 0.4%–1.6%).

**Conclusion:** Self-report of food allergy among US children has sharply increased in the past 2 decades. The increase has been greatest among non-Hispanic black children, a disparity that needs to be investigated.

© 2014 American College of Allergy, Asthma & Immunology. Published by Elsevier Inc. All rights reserved.

**Reprints:** Corinne A. Keet, MD, Johns Hopkins Hospital, CMSC 1102, 600 N Wolfe St, Baltimore, MD 21202; E-mail: [ckeet1@jhmi.edu](mailto:ckeet1@jhmi.edu).

**Disclosures:** Dr Savage has received research support from the American Academy of Allergy, Asthma and Immunology and the Food Allergy and Anaphylaxis Network. Dr Wood discloses consulting with the Asthma and Allergy Foundation of America, royalties from Up-to-Date, and service on the Medical Advisory Board to the Food Allergy and Anaphylaxis Network. Dr Matsui discloses receipt of a monetary award from ThermoFisher. Drs Keet and Peng and Ms Seopaul have no pertinent disclosures.

**Disclaimer:** The contents are solely the responsibility of the authors and do not necessarily represent the official view of the NCCR or NIH. Information on the NCCR is available at <http://www.nccr.nih.gov/>. Information on Re-engineering the Clinical Research Enterprise is available at <http://nihroadmap.nih.gov/clinicalresearch/overview-translational.asp>.

**Funding:** The study described was made possible in part by grants 1K12RR025006-01 (Dr Keet) from the National Center for Research Resources (NCCR), a component of the National Institutes of Health (NIH), and grant 1K23AI103187-01 from the NIH Roadmap for Medical Research (Dr Keet).

### Introduction

Food allergy is one of the most common chronic diseases of childhood, with widely varying estimates of prevalence worldwide and in the United States.<sup>1–3</sup> Several studies have suggested that the prevalence of food allergy has increased markedly during the past several decades in developed countries,<sup>4,5</sup> and this prevalence is perceived to have increased in the United States, but data regarding trends in the United States have not been systematically synthesized and evaluated.<sup>6–8</sup> In this systematic review and meta-analysis with meta-regression, we aimed to (1) determine the prevalence of self-reported food allergy in children in the United States and (2) explore sources of variation in prevalence estimates, including case definition, changes over time, and racial/ethnic differences.

Systematic reviews of self-reported food allergy prevalence have previously been published but had several limitations that we address in the current study.<sup>1,2</sup> Earlier studies have focused on

broad geographic areas, did not account for differences in wording of questions, and did not account for date of survey administration in their estimates, all of which likely contributed to wide prevalence estimates. Further, we incorporate the Centers for Disease Control and Prevention (CDC)–sponsored surveys of the US population into our analyses, which include a wealth of data available on hundreds of thousands of children. Although the criterion standard for diagnosis of food allergy is the double-blind, placebo-controlled oral food challenge, this method has yet to be used in epidemiologic studies in the United States, and questionnaire-based data from high-quality surveys are the best we have available. Thus, we examine the full range of publically available data on self-reported food allergy in US children.

## Methods

### Search Methods

We conducted a systematic literature search (up to February 2012) of MEDLINE and Embase for reports that included descriptions of the prevalence of food allergy in the United States. Search terms included *prevalence* and its synonyms combined with *food allergy* and its synonyms, including the combination of specific foods with allergy terms. In addition, we searched the reference list of all identified relevant publications and relevant reviews and examined publically available databases by searching the CDC websites<sup>9,10</sup> (see the eMethods for a detailed description of the search strategy). The search was updated on November 15, 2012, with one new relevant reference identified from reviewing titles or abstracts from 1,276 items found<sup>11</sup>; however, the data that were reported in this reference had already been incorporated into the meta-analysis. In addition, 2 new survey estimates were identified from the CDC (National Health Interview Survey [NHIS] 2011 and National Health and Nutrition Examination Survey [NHANES] 2009–2010<sup>12</sup>). The review protocol was not registered.

### Eligibility Criteria

Our first goal was to estimate the prevalence of self-reported food allergy in the general pediatric US population. Thus, studies that did not sample from the general population, were not based in the United States, did not report on individual-level data, did not include estimates for children, or did not include food allergy as an outcome were excluded. Included studies reported on the prevalence of food allergy overall and/or specific food allergies. All

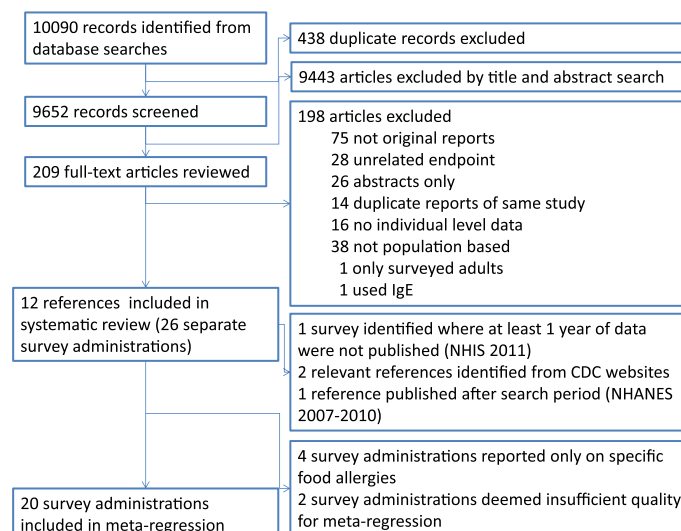
references were in English. There was no time restriction. Literature eligibility was assessed in duplicate (C.A.K. reviewed all of the references, and J.H.S., S.S., and E.C.M. jointly reviewed a duplicate search); discrepancies were resolved by consensus. References were first screened for eligibility by scan of titles and abstracts, followed by a full-text review. Our second goal was to assess the contribution of study- and individual-level covariates to variation in estimates of prevalence, specifically to assess temporal changes in food allergy prevalence, ethnic differences and changes over time, and the effect of questionnaire design on estimates of prevalence. Because only the surveys administered by the CDC were considered to be of high enough quality in terms of reporting response rate and accounting for nonresponse in their estimates, surveys included in meta-regression were limited to those conducted by the CDC (see details in the Results section).

### Data Collection Process

The following information was extracted from each reference: report characteristics (article name, authors, publication year, and journal), study characteristics (study name, year[s] of study, number of participants, method for selection of participants, and age of participants), participation rate when available, and diagnostic method for food allergy (self-report of diagnosis or symptoms in the past year, self-report of ever diagnosis or symptoms and/or self-report of food allergy with no period specified, laboratory testing [skin test or specific IgE], combination of laboratory testing and symptoms, or oral food challenge), prevalence and confidence intervals (CIs) of food allergy in general and specific foods (when available), and ethnicity-specific prevalences when available. Ethnicity was defined as non-Hispanic white (referred to as white here), non-Hispanic black (referred to as black), Hispanic, and other. When CIs or SEs were not published, binomial SEs and CIs were calculated from the published data or, if the underlying data were publically available, from the data directly using appropriate survey methods. See the eMethods for details about methods of analysis for publically available data. Clarification about details of study design and results were obtained directly from the study authors by personal communication for 2 reports.<sup>13,14</sup>

### Statistical Analyses

All analyses were conducted with Stata SE/11 (StataCorp, College Station, Texas) or R (Institute for Statistics and Mathematics of Wirtschaftsuniversität Wien, Vienna, Austria) statistical software.



**Figure 1.** Results of study search. CDC, Centers for Disease Control and Prevention; NHANES, National Health and Nutrition Examination Survey; NHIS, National Health Interview Survey.

Download English Version:

<https://daneshyari.com/en/article/3191254>

Download Persian Version:

<https://daneshyari.com/article/3191254>

[Daneshyari.com](https://daneshyari.com)