Food allergy prevalence in two population-based UK cohorts born 12 years apart.

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Declaration of interests

CV has received research funding from Reckitt and has provided consultancy or lectures for Nestle Nutrition Institute, Danone, Reckitt, Abbott, Else Nutrition , Ausnutria and HAL Allergy. The other authors declare no conflicts.

Author contributions

CV and WF wrote the first draft of different sections of the paper. MV and WF extrapolated the data and calculated percentages. KPN performed all other analyses. All authors read and edited versions of the paper.

Key words

FA, prevalence, temporal changes, pediatrics, childhood

Key messages:

- Reported adverse reactions to foods have remained stable between 1989 - 2001/2002.
- Sensitization rates remained stable during the first 10 years of life.
- Food allergy rates remained stable during the first 10 years of life.

Abstract

Background: Adverse food reactions include food allergy (FA; immune mediated) and food intolerances (non-immune mediated). FA are classified into IgE and non-IgE mediated FA. There is limited information available about changes in FA prevalence over time.

Methods: Two cohorts of children were evaluated, born on the Isle of Wight (IOW) 12 years apart. The IOW birth cohort (IOWBC; 1989 – 1990) and the FA and Intolerance Research birth cohort (FAIRBC; 2001 – 2002). We compared the prevalence of parental reported reactions to foods (adverse food reactions), allergic sensitization to foods and FA between the IOWBC and FAIRBC, at ages 1, 2, 3-4 and 10 years. FA included both IgE and non-IgE mediated FA.

Results: Reported adverse reactions to food and sensitization rates remained stable between the two cohorts. For example, FA at age 3-4 years was reported in 9.1% (95% CI 7.5, 10.7) in IOWBC and 8.3% (95% CI 6.5, 10.1) in FAIRBC (P=0.57) and food sensitization by skin prick test at age 3-4 years was found in 3.2% (95% CI 2.1, 4.3) in IOWBC and 4.5% (95% CI 2.9, 6.1) in FAIRBC (P=0.20). Confirmed FA prevalence was lower in FAIRBC then IOWBC at ages 1, 2 and 3-4, but these differences were not significant after adjustment for multiple comparisons. For example, FA at age 3-4 years was confirmed in 5.0% (95%CI 3.8, 6.2) in IOWBC and 3.0% (95% CI 1.9, 4.2) in FAIRBC (P=0.03, significance threshold after Bonferroni correction P<0.004). Confirmed cow's milk allergy rate was higher in IOWBC than FAIRBC at 3 years (*<0.001)* but not at other timepoints.

Conclusion: Our data show no evidence of changes in rates of adverse reactions to foods, food sensitization or food allergy during the first 10 years of life between two cohorts born in England in 1989-90 and 2001-2.

Introduction

Adverse food reactions include food allergy (FA) (immune mediated) and food intolerances (non-immune mediated). FA are classified into IgE and non-IgE mediated FA.(1) To fully understand the epidemiological data around FA prevalence, information regarding reported rates of FA, sensitization data and clinical FA needs to be considered.

In Europe, two systematic reviews have investigated reported reactions to foods, sensitization to food allergens based on skin prick test (SPT) and FA in children. Risk of bias was assessed for all studies included in these meta-analyses. It is however important to consider that study methodologies differed and that it was not always clear how many children suffered from IgE and non-IgE mediated FA.

The first systematic review with meta-analysis where possible summarized prevalence data from 2000 – 2012, with a follow-up systematic review summarizing data from 2012 – 2021.(2, 3) During 2000 – 2012, the pooled overall lifetime prevalence of self-reported FA was 17.3% and 19.8% during the period 2012- 2021.(2, 3)The overall pooled estimate for prevalence of FA based on a positive OFC or DBPCFC to any food was 0.9% during 2000–2012 and 0.4% during 2012–2021 in children and adults. (2, 3)The overall pooled estimate for prevalence of any FA based on a clinical history or food challenge, either a positive open food challenge (OFC) or a positive double-blind placebo-controlled (DBPCFC) was 2.6% in children during the period 2000-2012, and 2.5% during the period 2012 – 2021, indicating no evidence to support changes in FA prevalence across Europe.(2, 3)

For specific foods, another systematic review reported the point prevalence of sensitization rates as 0.7% for cow's milk and egg, and 2.2% for peanut but data were not separated between adults and children (2012 – 2021).(4) The corresponding numbers for the earlier period (2000 – 2012) were 0.3% for cow's milk, 0.8% for egg, and 1.7% for peanut. Sensitization rates to milk and peanut seem to have increased over time, while egg sensitization rates remained similar. (4)

Based on a clinical history or an oral food challenge, the point prevalence of cows milk allergy (CMA) (2012 – 2021) was 1.8%, egg allergy 0.6%, and no data were available for peanut allergy across Europe.(3) In 2000 – 2012, the point prevalence of CMA was 1.6%, egg allergy 1% and peanut allergy 1.6%.(2) The prevalence of CMA, seems to have remained stable or slightly increased whereas egg allergy prevalence seems to have increased.

In this paper we primarily aimed to compare the prevalence of reported adverse reactions to food, sensitization rates to all foods tested (cows' milk, hen's egg, wheat, soya, cod, and peanut) and sensitization to single foods (cow's milk, egg and peanut). Second, we reported on overall FA, and thirdly we reported FA to single foods cow's milk , egg and peanut between the original Isle of Wight (IOWBC)(5, 6) and the IOW FAIRBC, at 1, 2, 3-4, and 10 years of age.(7, 8) FA included both IgE and non-IgE mediated FA.

The data from this paper avoids the heterogeneity of other studies where comparative studies may not have been done in the same population and the paper is UK focused only, reflecting data from children born 1989 and 2001/2002, prior to the more recent studies. It is however important to note that data from both these cohorts were included in the European systematic reviews. (3, 4)

Methods

The Isle of Wight birth cohorts include the 1989 Isle Wight birth cohort (IOWBC) and the Food Allergy and Intolerance Research cohort (FAIR). (5-8)

The Isle of Wight Birth cohort

Inclusion criteria

The IOWBC included an unselected population of children. Families of all children born on the Isle of Wight, (UK) during 1989 - 1990 were approached for study participation. A total of 1536 children were eligible to be consented Following consent, (n = 1456) children were

recruited into the study followed up prospectively. Demographic and reported allergy data were collected at 12 weeks' gestation, at birth and during subsequent follow ups at set time periods. The study was approved by the Isle of Wight research ethics committee (06/Q1701/34). (5, 6)

The FAIR birth cohort

The FAIRBC included an unselected population of children. Families of all children born on the Isle of Wight, (UK) during 2001 - 2003 were approached for study participation. A total of 1063 children were eligible to be consented. Following consent, (n = 969) children were recruited into the study followed up prospectively. Demographic and reported allergy data were collected at 12 weeks' gestation, at birth and during subsequent follow up studies at set time periods. Ethical approval was obtained from the NRES South Central - Southampton B Research Ethics Committee (REF 10/H0504/11).(7, 8)

Demographic information (table 1), history of allergic disease and other relevant information for both cohorts was collected using similar questionnaires developed by the team on the IOW. Information was collected as interview administered questionnaires from the parents.

Outcome definitions used in the cohorts

<u>Reported rates of adverse food reactions</u>

Similar questionnaires based on the International Study of Asthma and Allergies in Childhood (ISAAC) studies, were used in both cohorts.(9)

<u>Skin prick test</u>

For both cohorts, SPTs were performed with standardized methods and extracts (ALK-Abello, Hørsholm, Denmark) to a panel of common aeroallergens and food allergens. Food allergens included cows' milk, hen's egg, wheat, soya, cod, and peanut. A positive SPT was defined as a positive reaction to 1 or more food allergens with a mean wheal diameter of 3 mm or larger elicited by the negative control at 15 minutes. In the IOWBC, SPTs were

performed at 1 and 2 years of age in symptomatic children only and at 4 and 10 years of age in all consenting participants. (5, 6) In the FAIR cohort SPTs were performed at 1,2, 3, and 10 years of age in all consenting participants.(7, 8) Skin prick tests in both cohorts were performed by the same team of nurses with standardized methodology.

Food allergy

For IOWBC, data collected over the course of the study were retrospectively reviewed to make a diagnosis of FA. No OFCs were performed. Three criteria were defined a priori, and all three needed to be met for the diagnosis of FA.(5) 1) A parental reported reaction to a food allergen, such as allergy to cow's milk, hen's egg, wheat, soya, peanuts, other nuts, fish, and shellfish; 2) a report of recognized allergic symptoms, such as: localized symptoms: itching, stinging/burning of the lips, mouth or throat, urticaria/hives, or angioedema; abdominal symptoms: nausea, vomiting, crampy/colicky abdominal pain, and diarrhea; respiratory symptoms: wheeze, stridor, watery rhinitis, and redness of eyes/nose; skin symptoms: urticaria, itching, flushed skin, and worsening eczema; or systemic reactions: anaphylaxis, 3) temporal relationship: symptoms developing within 4 hours of food ingestion. Children were defined as having a FA if 1, 2 and 3 were met.

In the FAIRBC, children were invited for oral food challenges (OFC) according to predefined criteria. Based on their prior history and results of the SPT during the first 3 years of life, the following children were invited to undergo oral food challenges.(7, 8) 1) Those with a positive SPT to a food that they had not knowingly eaten previously or 2) those who indicated a previous adverse reaction to foods (regardless of their SPT data). Conversely, children with a positive SPT to a food that they have previously consumed and tolerated with no prior reaction were not invited for an OFC.

Food challenges were conducted with all foods from 6 months of age, except for peanut and sesame, which were conducted once the children were 3 years old, as it was considered that infants should not be exposed to these foods in the first few years of life in

line with guidance at the time.(10) Some children were excluded from food challenges because their SPT diameter was above the 95% positive predictive levels.(11) OFCs at 1, 2 and 3 years were performed following a previously published algorithm. (7, 8, 12) All eligible children underwent open OFCs. Those with a history of immediate symptoms from prior ingestion of the food underwent a hospital challenge. Children of all ages who had a positive open OFC either at hospital or at home were invited to participate in a double-blind, placebo-controlled, food challenge (DBPCFC) to confirm the positive open OFC.(13) At 10 years of age the PRACTALL recommendations for food challenge doses were followed for IgE mediated FA.(14) FA was defined as a positive food challenge or a positive SPT and a convincing clinical history, as previously reported. (7, 8, 12) For non-IgE mediated FA, a normal portion of the food was given. FA was defined as positive food challenge as previously reported. (7, 8, 12)

A diagnosis of food allergy included both IgE and non-IgE mediated FA.
Differences in the study methodologies included that not all children in the IOWBC underwent SPT to the offending foods, whereas all consenting children in the FAIRBC underwent SPT. To make a diagnosis of FA, For reactions were reported up to four hours post ingestion in the IOWBC and up to days post ingestion which allows in the FAIR cohort. This did however allow for inclusion of both IgE and non-IgE mediated FA in both cohorts.

Statistical analysis of outcomes

Demographic, environmental, and allergic characteristics of participants were compared between cohorts with Chi-Square tests. Prevalence of sensitization and allergy were calculated with 95% confidence intervals (CI) and assessed for differences between cohorts at each year where both were available independently with either Chi-Square tests or Fisher's exact tests dependent on cell size. Significance level was set at 0.05 for descriptive tables but was adjusted using a Bonferroni approach to 0.05/4 =0.01 for reported adverse reactions, 0.05/8 = 0.006 for sensitization rates and 0.05/14 = 0.004 for food allergy rates to account for multiple comparisons.

Results

Participants

Demographic, environmental and allergic characteristics of participants in the IOWBC and the FAIRBC are shown in Figure 1 and Table 1. We compared demographic information in the two cohorts at 10 years of age. The cohorts were similar in terms of male:female ratio ($p=0.35$), reported atopic dermatitis at one year ($p=0.07$), aero-allergen sensitization at 10 years ($p=0.49$), maternal history of FA ($p=0.14$), and maternal smoking during pregnancy ($p=0.12$). IOWBC had a significantly higher follow-up rate at 10 years ($p<0.001$), more children consented to SPT($p<0.001$) and reported asthma at 10 years($p<0.001$). However, significantly less children in IOWBC ever suffered from allergic rhinitis ($p<0.001$) and had a maternal history of asthma ($p=0.01$). Both cohorts had aeroallergen sensitization rates at 10 years of 24-26% ($p = 0.49$).

Reported FA

At one year of age, reported adverse reactions to foods was 8.5% (95% CI: 7.0, 10.1) in the IOWBC and 7.2% (95% CI: 5.5, 8.9) in FAIRBC ($p = 0.31$). At two years of age, the reported reactions were 9.2% (95% CI: 7.5, 10.8) in the IOWBC and 8.4% (95% CI: 6.5, 10.3) in the FAIRBC at two and three years of age ($p=0.61$). At three years of age, it was 9.1% (95% CI: 7.5, 10.7) (IOWBC) and 8.3% (95% CI: 6.5, 10.1) (FAIRBC) ($p=0.57$).

At 10 years of age, it was 8.6% (95% CI: 7.1, 10.0) in the IOWBC and 9.3% (95% CI: 7.3, 11.3) in FAIRBC. ($p = 0.6$)(table 2 and figure 2).

Sensitization status

Sensitization rates (table 3 and figure 2) based on SPT ≥ 3mm are presented for peanut, egg, milk and all food allergens. No statistical differences between IOW and FAIR cohorts were reported at three/four ($p= 0.20$) and 10 years of age ($p= 0.11$) for overall food allergen sensitization status.

FA status

Overall FA

No significant differences in overall FA were seen between cohorts at any time period based on a Bonferroni correct p-value of 0.004. At one year, all FA were 5.3% (95% CI: 4.1, 6.5) in the IOWBC and 3.0% (95% CI: 1.9, 4.1) in the FAIRBC (p=0.01). At 2 years, it was 4.4% (95% CI: 3.2, 5.6) in the IOWBC and 2.4% (95% CI: 1.4, 3.5) in the FAIRBC (p=0.03). At 3 years, all FA were 5.0% (95% CI: 3.8, 6.2) in the IOWBC and 3.0% (95% CI: 1.9, 4.2) in the FAIRBC (p=0.03). At 10 years, all FA were 2.6% (95% CI: 1.7, 3.4) in the IOWBC and 3.6% (95% CI: 2.4, 4.9) in the FAIRBC (p=0.2).

Cow's milk allergy

At one year, (table 4 and figure 2) cow's milk allergy (CMA) was 3.5% (95% CI: 2.5, 4.5) in the IOWBC and 2.4% (95% CI: 1.4, 3.5) in the FAIRBC (p=0.21). At 2 years, milk allergy was 1.6% (95% CI: 0.9, 2.4) in the IOWBC and 1.2% (95% CI: 0.4, 1.9) in the FAIRBC (p=0.49). At 3 years, milk allergy was 2.6% (95% CI: 1.7, 3.5) in the IOWBC and 0.4% (95% CI: 0, 0.9) in the FAIRBC, which was a significant decrease from the earlier to the later cohort (p<0.001) and the only significant result seen for CMA. At 10 years, milk allergy was 0.5% (95% CI: 0.1, 0.9) in the IOWBC and 0.4% (95% CI: 0, 0.8) in the FAIRBC (p=0.75).

Egg allergy

At one year, egg allergy was 1.1% (95% CI: 0.5, 1.7) in the IOWBC and 1.8% (95% CI: 0.9, 2.6) in the FAIRBC (p=0.23). At 2 years, egg allergy was 1.3% (95% CI: 0.6, 1.9) in the IOWBC and 1.3% (95% CI: 0.5, 2) in the FAIRBC (p=1). At 3 years, egg allergy was 1.4% (95% CI: 0.7, 2.1) in the IOWBC and 1.0% (95% CI: 0.4, 1.7) in the FAIRBC (p=0.55). At 10 years, egg allergy was 0.6% (95% CI: 0.2, 1) in the IOWBC and 0.7% (95% CI: 0.1, 1.3) in the FAIRBC (p=0.3). No significant differences were seen.

Peanut allergy

At one year and 2 years respectively, peanut allergy was 0.1% (95% CI: 0, 0.2) and 0.2% (95% CI: 0, 0.4) in the IOWBC. Data in the FAIRBC was not available. At 3 years, peanut

allergy was 0.5% (95% CI: 0.1, 0.9) in the IOWBC and 1.2% (95% CI: 0.5, 2) in the FAIRBC (p=0.10). At 10 years, peanut allergy was 0.4% (95% CI: 0.1, 0.8) in the IOWBC and 1.5% (95% CI: 0.6, 2.3) in the FAIRBC (p=0.02). No significant differences were seen.

Other FA at 10 years

In the IOWBC FA to wheat (0.1.%), shellfish (0.2%), tree nuts (0.2%), fruits (0.3%), kiwi (0.1%), vegetables/tomatoes (0.3%) and other miscellaneous foods (0.2%) were also reported at 10 years.(2) In the FAIRBC, other FA that were diagnosed at 10 years of age, included wheat (0.5%), sesame (0.7%), Brazil nut (0.5%), almond (0.2%), hazelnut (0.4%), cashew nut (0.4%), pistachio nut (0.4%), and walnut (0.1%). No fruit and vegetable allergies were diagnosed in this cohort at 10 years of age.

Discussion

In this paper we aimed to compare the prevalence of reported adverse food reactions, sensitization status and FA in the IOWBC and the FAIRBC. Our main findings indicated that reported adverse reactions to food, sensitization rates and food allergy rates showed no significant evidence of change between the cohorts over the course of follow up. Fruit and vegetable allergies were reported in IOWBC but not in the FAIRBC. Tree nut allergies were reported in both cohorts. Sesame allergy was reported in the FAIR cohort but not in the IOWBC. Neither cohort reported any allergies to soy or corn. There are very few population-based studies with reported FA, sensitization rates and clinical FA available from the literature.

Overall FA

Gupta et al.(15) reported overall parental reported clinician diagnosed IgE mediated FA prevalence of; 8.8% at one year, 10% at 2 years, 8.3% at 3-5 years of age and 8% at 6-10 years. The HealthNuts study from Australia (2008) reported overall IgE mediated FA prevalence of >10% at 1 year and 4% at 4 years based on OFC. At six and ten years, these participants were diagnosed with IgE mediated FA, based on an algorithm of sensitization

status, OFC or history occurred in 6.4% of 6-year olds and 6.3% of 10-year-olds.(16) A study from South Africa diagnosed 2.5% of 1-3 year old with FA, based on OFC.(17)

Our data of the IOWBC and FAIRBC showed a lower rate of overall FA compared to Gupta et al. (15) and the HealthNuts study,(16) but is higher than the data from South Africa.(17)

In Europe, the overall pooled estimate for prevalence of any FA based on a clinical history or food challenge, was 2.6% in children during the period 2000-2012,(2) and 2.5% during the period 2012 – 2021,(3, 4) indicating no evidence to support changes in FA prevalence. We however, noticed no significant decrease in overall FA between the the 2 cohorts at 1 year (p=0.01), 2 years (p=0.03), 3 years (p=0.03) and 10 years (p=0.02) after the Bonferroni corrections.

The overall FA prevalence peaked at 1 year in IOWBC (5.3%) and at 3 years in the FAIRBC (3.9%). This is different from the data presented by Gupta et al. (15) and HealthNuts(16) but in the IOW cohorts, this finding was associated with a large decrease in egg allergy.

The systematic reviews reported that overall, the pooled estimate for the point prevalence of a positive SPT to any food allergen was 4.5% in children (2000 – 2021). (4) The overall pooled estimate for prevalence of any FA based on a clinical history or food challenge, either a positive open food challenge (OFC) or a positive double-blind placebo-controlled (DBPCFC) was 2.6% in children during the period 2000-2012,(4) and 2.5% during the period 2012 – 2021, indicating no changes in FA prevalence across Europe.(3)

Overall FA sensitization

We did not see any significant changes in overall food allergen sensitization between the 2 cohorts from the IOW. The European systematic reviews demonstrated an increase in SPT positivity to any food allergen from 2.7% in 2000–2012(4) to 6.9% during 2012–2021.(3)

Peanut allergy

In terms of childhood parental reported clinician diagnosed peanut allergy at ages 1, 2, 3-5, and 6-10 years in a US population, Gupta et al.(15) reported a prevalence of 2.2%, 2.4%, 2.1% and 2.6%. Overall, the point prevalence of peanut allergy at each respective age was lower than Gupta et al. (15) in both IOWBC and FAIR studies. A third cohort born on the Isle Wight in 1997, showed a peanut allergy prevalence rate of 1.4% at 4 years of age and also showed lower rates than reported by Gupta et al.(18)

The HealthNuts study reported a peanut allergy prevalence of 3% at one year and 1.4% at 4 years based on oral food challenges. At 6 and 10 years, peanut was the most common FA (3.1%, and 2.9%) based on a diagnostic algorithm.(16) Compared to the Healthnuts study, the IOWBC data was lower (0.1%) at one, 4 (0.5%) and 10 years (0.4%) using their predefined criteria.(5) The FAIR birth cohort showed similar rates at 3 years (1.2%) and lower at 10 years (1.5%) using OFC outcomes and/or a clinical history with supporting sensitization status. (7, 8)

The European systematic review indicated that point prevalence peanut allergy based on an oral food challenge decreased from 0.2% (2000 – 2012)(2) to 0.03% (2012 – 2021) , although only a few studies were available for 2012–2021.(3) At 10 years of age there was no difference in the prevalence of food allergy between the two cohorts after Bonferroni correction.

Peanut sensitization

The sensitization rates to peanut at 10 years of age was 1.7% in the IOWBC, and 2.4% in the FAIRBC, with no significant difference (p=0.48). This correlates with findings of a systematic review and meta-analysis within Europe describing no significant changes in peanut SPT positivity between 2000-2012 (1.7%, 95% CI: 0.99-2.98) and 2012-2021 (2.0%, 95% CI: 1.57-1.92).(4) There are few studies that have looked at peanut sensitization in children at 10 years of age. Two European studies described higher rates of sensitization

than the IOW cohorts. De Jong et al. (19) reported a point prevalence of peanut sensitization at 10 years in the Netherlands of 3.2%. Erhard et al.(20) described a positive SPT and or specific IgE prevalence in children aged 8-9 to be 11.5%.

Egg allergy

For egg allergy, Gupta et al.(15) reported a parental reported clinician diagnosed prevalence of 2% at one year, 1.4% at 2 years, and 1.3%, between ages of 3-5, and 0.9% between the ages 6-10 years. These figures are similar to our analysis of egg allergy prevalence in children of the same age groups of both birth cohorts. However, our data (IOWBC 1.1% and FAIRBC 1.78% at one year)(5, 12) demonstrates much lower rates of egg allergy than the 8.9% of egg allergy reported at one year in the Australian HealthNuts cohorts. (16) It is important to note that of those with raw egg allergy in the Healthnuts study, 80.3% could tolerate baked egg. The FAIRBC oral food challenges were performed with boiled egg which may explain the discrepancy. Interestingly, only 0.6% were diagnosed with egg allergy in the Healthnuts cohort at 10 years of age which is similar to the data from Gupta et al. (15) but still higher than both of the IOW cohorts. Within Europe egg allergy based on OFC or a clinical history decreased from 1.0% to 0.6%, between 2000 – 2012 to 2012 -2021 but the form of the egg used in the studies were not specified.(4) Our data did not indicate any significant changes in egg allergy over time.

Egg sensitization

In Europe, the SPT positivity of egg decreased from 0.8% to 0.4% from 2000-2012 to 2012-2021.(4)Our data did not indicate any significant changes over time.

Cow's milk allergy

CMA is the most complex FA of childhood, often presenting as both IgE and non-IgE mediated CMA. The Diagnosis and Rationale for Action Against CMA(DRACMA) guidelines estimate the prevalence of world-wide CMA to be 1.9 – 3% during the first few years of life.(21) Gupta et al. (15) reported a prevalence of IgE mediated CMA of 3.3% at 1 year,

4.3% at 2 years, 2.8% at 3-5 years and 1.9% at 6-10 years. This well documented decrease in both non-IgE and IgE CMA with age is similarly reflected in both our birth cohorts; CMA allergy was highest at 1 year of age (IOWBC: 3.5%, FAIR: 2.4%), and lowest at age 10 (IOWBC: 0.5%, FAIR: 0.4%).(5, 12) The significant difference in CMA prevalence between the IOWBC and FAIRBC at 3 years ($p<0.001$) is most likely due to the fact that the IOWBC did not perform OFC. As the IOWBC did not distinguish between IgE and non-IgE mediated CMA, it is difficult to speculate which effect the type of CMA might have had on the prevalence figures. Within Europe CMA prevalences based on OFC or clinical history decreased of over the period 2000 – 2012 (1.56%) to 2012 – 2021 (0.75%).(4)

Cow's milk sensitization

The European systematic review indicates that cow's milk sensitization has increased significantly over the period (2000 – 2012; 0.33) and (2012 – 2021; 3.82%).(4) We did not see any significant changes in cow's milk sensitization between the two cohorts.

The strength of our study is that it is the only study in Europe investigating changes in reported adverse reactions to food, food allergen sensitization status and FA in two cohorts born in the same geographical area ten years apart. The same research team led and conducted the research which increased comparability of outcomes in the same cohorts. The paper has a number of limitations. One limitation of the study is that the criteria for FA were not exactly similar in the two studies. The IOWBC used defined criteria for capturing IgE and non-IgE mediated FA. The FAIRBC based their diagnosis of FA on a clinical history plus a supportive IgE or a positive OFC irrespective of sensitization status. However, the definitions used allowed capturing the prevalence of both IgE and non-IgE mediated FA in the two cohorts. Other limitations included that the selection of who would undergo SPT varied. We could not compare sesame sensitization and allergy data as it was most likely not considered a major allergen in 1989.

Conclusions

In conclusion, our data indicate that reported FA, sensitization and food allergy rates showed no significant evidence of change between two cohorts born in 2001- 2002 and 1989. This is consistent with systematic reviews indicating the prevalence of FA did not substantially change over the period 2000 – 2012 and 2012 – 2021. The significance of our data is that it was derived from two cohorts in a single geographic population. We are in a unique position to compare data on reported adverse food reactions, sensitization rates and diagnosed FA between two cohorts in the same population over a period. Despite some differences in the diagnosis of FA, our data contributes to the literature by challenging high rates of FA published elsewhere. It also challenges the concept that FA rates are increasing world-wide. We highlight the need for further studies on clearly defined FA outcomes in the same population over time.

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Tables and figure legends

Table 1: Descriptions of IOWBC(1989-90) and FAIRBC(2001-02) at the 10 year follow-up

Table 2: Reported adverse reactions to food in the IOWBC(1989-90) and FAIRBC(2001-02) with 95% confidence intervals (CI).

Table 3: Sensitization rates in the IOWBC(1989-90) and the FAIRBC(2001-02) with 95% confidence intervals (CI).

Table 4: Food allergy rates in the IOWBC(1989-90) and the FAIRBC(2001-02) with 95% confidence intervals (CI).

Figure 1: Summary of follow-ups of the Isle of Wight (IOW) Birth cohort and the FA and Intolerance (FAIR) birth cohort

Legend: Figure 1 summarizes the different time points of follow-up, number of children seen or tests performed at each time point.

Figure 2: Temporal changes in the reported rates of adverse food reactions, sensitization and prevalence of milk, egg, peanut and overall FA in the the
IOW birth cohort and FAIR birth cohort

Legend: Figure 2 describes the temporal changes in the reported rates of adverse food reactions, sensitization status, prevalence of milk, egg, peanut and overall FA in the the IOW birth cohort and FAIR birth cohort