

Food Sensitive Study: Wave Two Survey

Area of research interest: [Food hypersensitivity](#)
Planned completion: 31 March 2022
Project status: Completed
Project code: FS430406
Authors: Dr Rebecca Knibb, Lily Hawkins and Professor Dan Rigby
Conducted by: Aston University and the University of Manchester
Date published: 20 September 2022
DOI: <https://doi.org/10.46756/sci.fsa.nyx192>

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Results available: Results available
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Executive Summary

Introduction

Food hypersensitivities (FH) include food allergy, food intolerance and coeliac disease. Food allergy and coeliac disease involve an immune mediated reaction to certain foods; food intolerance is caused by a non-immune mediated reaction (such as an enzymatic or pharmacological effect). Each of these FHs result in unpleasant symptoms if the food is eaten in sufficient quantity, with food allergic reactions sometimes resulting in life-threatening symptoms. Management of FH by an individual or members of their family therefore involves constant vigilance and risk assessment to determine if a food is safe to eat. Research over the last twenty years has demonstrated that this burden, along with the unpredictable nature of FH reactions, has an impact on quality of life (QoL). QoL encompasses our emotions, physical health, the environment we live in, our social networks and day-to-day activities. FH has been shown to have an impact on many of these areas, however there are still research gaps. In particular, many studies focus on children, adolescents or parents rather than the adult population and little is known about those with food intolerances. In order to make a comprehensive characterisation and evaluation of the burden caused by living with FH, the day-to-day management of FH and associated inconveniences, the FSA has commissioned this project, led by Aston University. The project is called the FoodSensitive study and this report relates to findings for workstream one, a survey to assess the impact of FH on QoL. This survey was carried out in two waves, one year apart. This report covers the second wave and a comparison of wave one and two for those participants who completed both waves.

Research aim

The aim of this survey was to characterise the management of FH of individuals living in the UK and evaluate the resultant impact on their QoL. A further aim was to compare management of FH on individuals who completed the survey at two time points, one year apart, to explore any changes in the impact of FH on these individuals.

Methods

Design

This was a cross-sectional online survey. It was administered one year after the previous survey and so is also a part longitudinal design for participants who completed both waves. This report provides the findings for the second of these two waves and a comparison of data from wave 1 and wave 2 for those participants who completed both waves. Key data collected included:

- detailed information on foods, symptoms, diagnosis, medication and hospitalisation
- experiences when eating out
- general and FH specific quality of life.

The data was collected between 10th October 2021 and 14th December 2021. During this time people living in the UK experienced some restrictions on day-to-day living, including eating out, due to the Covid-19 pandemic. This should be considered when considering the results.

Participants

Participants were adults with FH, parents of children with FH (aged 0 to 17 years) and children (aged 8 to 17 years) with FH, living in the UK. FH was defined as experiencing a bad or unpleasant physical reaction after consuming food. An opportunity sample (anyone who saw the study advert and was eligible to take part) was recruited through advertising via patient organisations: Allergy UK, the Anaphylaxis Campaign, the Natasha Allergy Research Foundation and Coeliac UK. The survey was also advertised on Twitter and had a study webpage with links to the surveys on the FSA site. Participants were also recruited through online survey panels via Qualtrics. In addition, participants from wave one who stated they were happy to be contacted again about the survey were sent an email with the study invite and a link to the survey.

Measures

All measures used in wave 1 were re-used for wave 2. There were some minor amendments to questions about the day-to-day management of FH. Some questions about experiencing reactions in front of others were removed as the FSA had included them in their Food and You 2 survey. Other questions were added, such as how many reactions participants had experienced in the last year and where.

Participants first completed a questionnaire developed by the project team to collect demographic data and information about FH and eating out. When asking about foods, participants were asked to first provide a list of all foods they (or their child) reacted to, and then provide more detailed information on up to three of those foods that they considered had a big impact on their lives. For each of these foods they were asked to say whether they thought their reaction was a food allergy, food intolerance or coeliac disease. Their response to this question for the first food they reported details on was used to direct them to the appropriate quality of life scale. They were also asked to say whether they thought the FH was mild, moderate or severe.

In order to measure quality of life, existing validated measures were used. In order to measure quality of life that was specific to FH we used food allergy, food intolerance and coeliac disease quality of life scales. We also measured general quality of life using the EQ-5D. This scale measures quality of life in general domains such as usual activities, pain, mobility, and anxiety. All FH specific and general quality of life scales were age-appropriate, and parents completed proxy versions for their children.

Data Analysis

Participants were put into the following sub-groups for analysis:

1. Respondents with food allergy only
2. Respondents with food intolerance only
3. Respondents with coeliac disease only
4. Respondents with multiple hypersensitivities which included any two (or all three) of allergy, intolerance and coeliac disease.

Descriptive information is provided for all survey questions in the form of text, tables and graphs where appropriate. Comparisons across mean scores for groups were conducted using ANOVAs, which provide an overall F value to tell you if there is a significant difference. The effect size (η^2) was reported for all ANOVAs. Pearson's correlations were used to examine relationships between pairs of continuous variables. Correlations are used to see if two sets of data are related in some way, so for example to see if higher scores in a variable is related to higher or lower scores in another variable. Where group sizes were large enough, regression analysis was conducted to see what variables might predict QoL.

For the QoL analysis, the following comparisons were made for each group where appropriate:

- between clinically diagnosed and self-diagnosed conditions
- by gender
- by age
- by number of foods/allergens reported
- self-reported severity

For participants who had completed wave 1 and wave 2, answers to survey questions were compared for changes over time where there were sufficient numbers in each group.

Results

A total of 1,065 adults with FH, 750 parents of children with FH, and 349 children with FH completed the survey for wave 2 and were included in this report. Of these 313 adults, 77 parents and 15 children with FH had also completed wave 1. Those reporting 'other' and 'don't know' regarding the type of FH they had were excluded from the statistical analysis as we focused on the specific sub-groups listed above, however they were included when reporting descriptive information for the whole sample. For comparisons between wave 1 and wave 2, only answers from adults and parents were compared as numbers were too small to compare results for children.

Key findings for adults

Sample characteristics

- overall, 1,065 adults took part in wave 2: 323 with food allergy; 330 with food intolerance; 217 with coeliac disease; 131 with multiple hypersensitivities

- most adult respondents were female (76%); the mean age of respondents was 51 years old, with a minimum of 18 years and a maximum of 86 years
- adults reported detailed information on 1,549 foods which caused a bad or unpleasant physical reaction (please note this is not separate types of food but the number of foods reported in total by adults). The most common food reported was cereals containing gluten (n = 403; 26%), followed by other foods (n = 222; 14%) and milk (n = 178; 11%).

Eating out

- over half (66%) of adult respondents felt comfortable in asking staff for information when eating out because of a concern about experiencing a bad or unpleasant physical reaction to food
- over half (60%) of adult respondents felt confident that written information provided by the venue when eating out allows them to identify foods that cause a reaction. Adults were less confident in information provided verbally by staff (52% reported being very or fairly confident)
- a quarter of adult respondents (25%) reported that they had been refused service when eating out because of their FH, and around one in ten (14%) had previously been asked to sign a disclaimer when eating out
- 40% of respondents reported at least one reaction to food in the last 12 months to and most of these reactions were experienced at home (62%)

Quality of life

- the average scores captured on the FH specific quality of life scales indicated that adult respondents felt that their FH affected their quality of life 'moderately' to 'quite a bit'
- adults with FH who reacted to more than one food reported significantly poorer FH specific quality of life than those who only reacted to one food
- adults who self-reported mild or moderate FH reactions reported significantly better FH specific quality of life than those who reported severe reactions
- adults with food intolerance or multiple FHs reported lower generic quality of life (scored using the EQ-5D-5L) than adults with food allergy or coeliac disease
- compared to the UK population distributions for the EQ-5D-5L, significantly less adults reported the 'best' quality of life, but significantly more reported 'moderate' quality of life across all sub-domains
- eating out more frequently was significantly related to better FH specific quality of life
- checking information more frequently, at most stages of eating out, was significantly related to poorer FH specific quality of life
- how comfortable participants were in asking staff for information when eating out, and how confident they were in the written and verbal information provided when eating out was significantly related to better FH specific quality of life.
- reacting to food in a product or dish served despite checking available allergen information was significantly related to poorer FH specific QoL
- in regression analyses, a more severe reaction (self-reported as mild, moderate or severe), greater number of foods reacted to, greater frequency of checking information, greater frequency of asking staff for information and greater number of reactions in the last 12 months significantly predicted poorer FH specific QoL.

Comparisons between adults in Wave 1 and Wave 2

- a total of 313 adults completed the survey at both time points
- there were no significant differences between wave 1 and 2 in frequency of eating out, frequency of checking information, feeling comfortable or confidence in verbal information provided about allergens

- adults in wave 2 were significantly less confident in written information provided about allergens than in wave 1
- there were no significant differences between wave 1 and 2 for food allergy specific QoL
- those with food intolerance or coeliac disease reported significantly better FH specific QoL in wave 2 compared to wave 1
- however, generic QoL as measured by the EQ5D visual analogue scale, was significantly poorer in wave 2 compared to wave 1

Key findings for parents

Sample characteristics

- overall, 750 parents took part in wave 2 (reporting on n = 933 children): 399 parents of children with food allergy; 176 with food intolerance; 21 with coeliac disease; 134 with multiple hypersensitivities
- 78% of parent respondents were female; the mean age of respondents was 37.1 years (range 18 to 62 years)
- 57% of the children were male; the average age of the children was 7.7 years (range 0 to 17 years)
- parents reported detailed information on 1,523 foods their children reacted to (please note this is not separate types of food but the number of foods reported in total by parents). Tree nuts (n = 298; 20%), milk (n = 296; 19%), eggs (n = 215; 14%) and peanuts (n = 142; 9%) were the most frequently reported foods

Eating out

- almost three quarters (72%) of parent respondents felt comfortable in asking staff for information when eating out, because of a concern about their child experiencing a bad or unpleasant physical reaction to food
- two thirds (65%) of parents felt confident that written information provided when eating out allows them to identify foods that will cause their child a reaction
- slightly fewer parents (55%) were confident in information provided verbally by staff
- a third of parents (34%) reported they had been refused service when eating out because of their child's FH, and 23% reported they had been asked to sign a disclaimer when eating out because of their child's reactions to food
- the majority of parents (76%) reported their child had experienced at least one reaction to food in the last 12 months and most of these reactions (52%) were experienced at home, followed by at school (14%)

Quality of life

- the average score on the FH specific quality of life scales indicated that parents felt that their child's FH affected their child's quality of life 'quite a bit' or 'very much'
- there were no differences in FH specific quality of life based on age or gender of the child
- parents who self-reported that their child experienced mild or moderate reactions reported significantly better FH specific quality of life than those with children who reported experiencing severe reactions
- parents of children with multiple FHs reported the poorest generic quality of life for their child (scored using the EQ-5D-3L), followed by coeliac disease, food intolerance and then food allergy
- parents of children with FH reported their children had better quality of life for mobility and usual activities compared to parent-reported quality of life for pain and anxiety on the generic QoL scale

- in regression analyses, a more severe reaction (self-reported as mild, moderate or severe) significantly predicted poorer FH specific QoL for teens (13-17 years)

Comparison between parents in Wave 1 and Wave 2

- a total of 77 parents completed the survey at both time points
- parents reported they ate out significantly more often at wave 2 compared to wave one (less than once a month compared to around once a month)
- there were no significant differences between wave 1 and 2 in frequency of checking information, feeling comfortable or confident in verbal or written information provided about allergens
- parent-reported generic QoL (as measured by the EQ5D visual analogue scale), for children was significantly better in wave 1 compared to wave 2

Key findings for children

Sample characteristics

- overall, 349 children took part: 141 with food allergy; 139 with food intolerance; 29 with coeliac disease; 21 with multiple hypersensitivities
- just over half (52%) of child respondents were male; the average age of the children was 12.6 years (range of 8 to 17 years)
- the children reported detailed information on 440 foods they reacted to (please note this is not separate types of food but the number of foods reported in total by children). The food most commonly reported was milk (18%)

Eating out

- when eating out and before ordering food, just under half of child respondents reviewed available information always or most of the time (49%)
- just over half (56%) of children felt comfortable asking a member of staff for information about the food when eating out, because of a concern about experiencing a bad or unpleasant physical reaction
- almost two thirds (63%) of children felt confident that the written information provided when eating out that allows them to identify foods that cause them a bad or unpleasant physical reaction. A slightly lower proportion of children were confident in the information provided verbally by staff when eating out (59%)
- around a fifth (22%) of children reported they had previously been refused service when eating out because of their FH
- 79% of children stated they had had a reaction in the last 12 months and the majority of the reactions happened when they were at home (58%)

Quality of life

- the average score on the FH specific quality of life scales indicated that children felt that their FH affected their quality of life 'moderately' to 'quite a bit'
- there were no differences in FH specific quality of life based on age or gender
- children with self-reported mild or moderate reactions reported better FH specific quality of life than those with severe reactions
- 8-12 year-olds with food allergy or intolerance had similar scores on the EQ-5D-3L regarding generic quality of life, with those with multiple FHs scoring lowest, and all children with FH scored worse for pain/discomfort and anxiety/depression than they scored for usual activities or mobility

- 13-17 year-olds with food allergy had better scores on the EQ-5D-5L regarding quality of life than those with intolerance and coeliac disease, and all respondents in this age group scored worse for pain/discomfort and anxiety/depression than they scored for usual activities or mobility
- generic QoL as measured by the EQ5D visual analogue scale, was significantly poorer in wave 2 compared to wave 1.
- in regression analyses, higher frequency of checking available information before choosing where to eat out significantly predicted poorer FH specific QoL for children aged 8-12 years with food allergy or intolerance; severity of FH significantly predicted poorer FH specific QoL for teens aged 13-17 years with food allergy
- no comparisons between wave 1 and wave 2 were made for children as not enough children completed both waves

Conclusions

The second wave of this UK based survey has provided further insights into the impact of FH on day-to-day activities and quality of life of adults and children. Similar to wave 1, a wide variety of foods causing unpleasant symptoms were reported, with foods containing gluten, milk, tree nuts and peanuts reported most often. Similarly, participants reported a range of symptoms, from gastrointestinal, skin reactions, breathing difficulties, swelling and anaphylaxis.

Eating out

The findings from the wave 2 cohort are very similar to the wave 1 cohort regarding eating out. Similar to wave 1, adults and parents reported being more confident in written information provided by staff when eating out, compared to information provided verbally. However for those adults who completed both waves, confidence in written information was less in wave 2 compared to wave 1. It is unclear why this difference might be. Legislation for pre-packed food for direct sale came into law in October 2021 when the second survey was launched, meaning that full ingredient labelling was needed, but this may not have had much impact on consumers in the short time the surveys were live. The worldwide Covid pandemic and the UK leaving the EU disrupted supply chains and substitutions to foods may have increased the use of precautionary allergen labelling, which may have contributed to this.

Similar proportions of adults, children with FH and parents of children with FH reported they felt comfortable asking a member of staff for information because of a concern about experiencing an unpleasant physical reaction and were confident in written information provided about allergens. All groups were less confident in verbal information provided by staff. Around a fifth of parent and child respondents and a third of adult respondents reported previously being refused service or having been asked to sign a disclaimer. It may therefore be important to investigate the ability and confidence in waiting staff in restaurants to provide suitable information for people with FH.

Quality of life

All participants reported that their FH or their child's FH impacted their lives by 'quite a bit' or 'very much'. Self-reported or parental reported severity of FH was related to the level of quality of life as measured by the FH specific validated QoL scales. Severity also significantly predicted QoL for adults and teens with any FH.

FH specific QoL was also related to eating out activities in meaningful ways. Being more comfortable asking staff for information about food, and higher confidence in the verbal or written information provided about food when eating out, were related to better quality of life. However, a greater frequency with which participants had to check information at various stages of eating out was related to poorer QoL. As noted in the report for wave 1, checking behaviour may create a

greater burden on the individual or parent, which has an impact on QoL. In a regression model for adults, more frequent checking of information when eating out and frequency of asking staff for information significantly predicted poorer QoL. Similarly for 8-12 year olds more frequent checking of information when eating out significantly predicted poorer QoL. For many of the parent and child models, a small proportion of variance in quality of life was explained, but few or no individual predictors were significant.

Adults, parents of children and children themselves with food allergy reported better generic quality of life than those with food intolerance or coeliac disease and those with multiple FHs often scored poorest. This was also reported in wave 1 and requires further investigation to see whether the people with different FHs require different types or level of support to help improve their QoL. For adults, reported generic quality of life was worse than UK norms. Adults with food intolerance or coeliac disease reported significantly poorer FH specific QoL in wave 1 compared to wave 2 and a further analysis of the data comparing the whole of cohort 1 and cohort 2 is required to investigate reasons for this, such as differences in clinical factors or severity for these participants. For all groups who completed the surveys at both time points, reported generic QoL was significantly worse at wave 2 compared to wave 1. As this is generic QoL, this reduction could be due to factors beyond FH, such as the continued impact of Covid and the restrictions this has brought to day-to-day living.

In conclusion, self-reported severity, frequency of checking FH information and confidence in information about ingredients in foods were the key variables associated with quality of life. There are some limitations that should be taken into consideration:

- it is not known how representative of the UK FH population the survey is, as prevalence of different FHs are not yet known
- there is a predominance of white British adult females completing the survey (for adult and parent surveys) which is likely to have influenced the data collected
- data was collected during the Covid-19 pandemic which could have had an undue impact on day-to-day living, QoL and eating out.

Food Sensitive Study: Introduction

Introduction

Background

This report presents findings from research conducted by Aston University on behalf of the Food Standards Agency (FSA). The FSA is an independent government department responsible for protecting public health and consumers' interests in relation to food across England, Wales and Northern Ireland. As part of their function to protect public health, the FSA plays an important role in ensuring that members of the public are protected from potentially life threatening food hypersensitivities, by working with consumers and the food industry to ensure consumers with food hypersensitivities can make safe and informed choices.

Food hypersensitivities (FH) include food allergy, food intolerance and coeliac disease. Eating a food you are sensitive to can result in an adverse reaction with unpleasant and sometimes life-threatening symptoms. Management of FH therefore involves constant vigilance and risk assessment to determine if a food is safe to eat. Research over the last twenty years has demonstrated that this burden, along with the unpredictable nature of FH reactions, has an impact on quality of life (Cummings et al., 2010; Morou et al., 2014). Children, adolescents, adults and parents of children with FH invest a large amount of time and resource in managing the risks

associated with an adverse reaction. FH can affect social life, such as eating out; school or work life; relationships with significant others; and can cause anxiety surrounding both eating and the management of a reaction to food (DunnGalvin et al, 2009; Gallagher et al., 2011).

The FSA has a vision to improve the quality of life for people living with FH ([footnote 1](#)) and recently commissioned research to explore the impact of legislation which specified that information on specific allergens be provided for foods that are not prepacked ([footnote 2](#)) (Begen et al., 2018; Begen et al., 2018). The work was led by the University of Bath and included collecting data on the quality of life of individuals with FH, and parents of children with FH regarding experiences when eating out. They reported on current eating out behaviours, satisfaction with and confidence in information provision about allergens, and preferences for information provision. Greater positivity and adventurousness when eating out was associated with better health-related quality of life (QoL), whereas greater preparation needed for eating out was associated with lower health-related QoL.

Despite the focus of research on the quality of life of those with FH, there are still significant gaps in the literature, as apart from the study conducted by the University of Bath, few studies have focused on food intolerance or adults with FH. Little is known about the factors associated with high or low QoL or how this might change over time. In order to address this, the FSA has commissioned this project to characterise and evaluate the burden caused by living with FH, the day-to-day management of FH, and associated inconveniences.

Aims of the project

The current project, called the FoodSensitive study, was conducted across two linked workstreams. The first workstream aimed to develop and test a survey to collect data on the management, and impacts of FH on daily lives, and the resultant quality of life individuals with FH experience. This information was collected in two waves, one year apart. The second workstream aimed to produce monetary valuations on the non-tangible elements of food hypersensitivities, including pain, grief and suffering, through eliciting Willingness to Pay (WTP) values (how much someone would be willing to pay to remove the anxiety and day-to-day impact related to having a FH). The sample for this work included, but was not limited to, the sample from workstream one. In line with the FSA's statutory responsibility to protect consumer interests in food, and to enable the FSA to further understand these conditions and seek ways to reduce their burden, samples for both workstreams were drawn from individuals living in the UK.

This report provides the findings for wave 2 of the survey collected for workstream one, published in the [Food Sensitive Study Wave 1 Report](#). The aim of this survey was to collect further data on the management, quality of life and impact of FH on the daily lives of children and adults with FH, as well as parents of children with FH. Comparisons between those that completed the survey at wave 1 and wave 2 were also made. The data for wave 2 were collected between the 10th of October and the 14th of December 2021. (Data for wave 1 were collected between 28th October 2020 and 4th January 2021)

Methods

Study design

This was a cross-sectional online survey. It was administered one year after the previous survey and is also a part longitudinal design for participants who completed both waves. This report provides the findings for the second of these two waves and a comparison of data from wave 1 and wave 2 for those participants that completed both waves. The research approach taken for the second of these two survey waves is the same as that taken for the first wave and is summarised below. More detailed information can be found in the technical report.

Participants and recruitment

Three separate groups of participants were recruited: adults with FH; parents of children with FH (aged 0-17 years); children (aged 8 to 17 years) with FH, living in the UK. FH was defined as experiencing a bad or unpleasant physical reaction after consuming food. The wording of the definition was developed to identify this population in the [FSA's Food and You survey](#), and was based on previous work conducted by Professor Barnett and colleagues at University of Bath, [The preferences of those with food allergies and/or intolerances when eating out study](#). The definition had also been through cognitive testing for the FSA's revised Food and You survey in Summer 2020 (Food and You 2). For recruitment purposes, FH was divided into 3 categories: food allergy, food intolerance and coeliac disease.

Participants from wave one of the survey who consented to be contacted again were sent an email with the study advert and a link to the surveys. As the FH profile of the population in the UK is unknown, a non-probability opportunity sample was also recruited. The opportunity sample consisted of anyone who saw the study advert and was eligible to take part, and participants were recruited through advertising via patient organisations: Allergy UK, the Anaphylaxis Campaign, the Natasha Allergy Research Foundation and Coeliac UK. The survey was also advertised on Twitter. In order to reach children, advertisements were targeted at parents. The project team also advertised through their own networks including university research participation advertising. These methods enabled a rapid and cost-effective way of recruiting the desired cohort. Importantly these methods allowed the study to reach out to those with relatively milder symptoms, in particular people with food intolerance, who may not have sought medical input. It must be noted, however, that these approaches are likely to be affected by respondent biases whereby participants are more highly motivated towards FH issues, particularly those associated with patient organisations, and therefore likely to take part, and are generally of a higher socio-economic status. Using an online platform restricts the survey to people who have access to the internet.

Recruitment rates and the profile of those responding were closely monitored to minimise the risk of under-recruitment in any one group. Initially the numbers of adults, parents and children responding against the overall target numbers for these groups were monitored. The number of respondents reporting food allergy, food intolerance and coeliac disease were then also monitored within each of these groups. Similar to wave one, recruitment was supplemented where needed with the use of online survey panels through Qualtrics to meet the target numbers in each group, and to try and ensure an equal spread of allergy, intolerance and coeliac disease. QualtricsXM is a worldwide company that offers a secure online survey system and the ability to recruit participants with specific inclusion and exclusion criteria to online studies. Qualtrics advertised the study to their UK panel and also advertised to parents in order to recruit children with food hypersensitivities (further information about this can be found in the technical report).

Screening questions at the start of the survey asked individuals if they lived in the UK and had a bad or unpleasant reaction to food. For each survey there was also a specific screening question regarding age or if they were a parent. All participants had to complete the screening questions at the start of the survey to ensure they were eligible for this study.

Measures

In order to capture the data needed for this study, a combination of bespoke questions and a suite of validated psychometric scales were used. The bespoke questions were required to understand impact on day-to-day life that weren't captured by the psychometric scales. This included demographic and FH information as well as questions designed to measure the day-to-day management and impact of food hypersensitivity for each age group and for parents. All measures used in wave 1 were re-used for wave 2, with some minor amendments. Some

questions were removed as the FSA had included them in their Food and You 2 survey (particularly around shopping, label reading, reacting in social situations and information sources for FH).

After providing demographic information, respondents were asked to list all foods they reacted to; then provide further details of up to three foods that they perceived had a big impact on their life.

Parents were asked to provide details of up to three children and up to three foods per child.

This enabled data to be captured on the complexity of FH while not overburdening respondents.

For each of the three foods, respondents were asked about specific symptoms, self-reported severity, method of diagnosis, medication and hospitalisation. Respondents were asked to indicate if they thought their reaction to each of these three foods was due to food allergy, food intolerance or coeliac disease. Respondents could also choose to report a different reaction, or to state if they did not know the type of reaction they had. They were then classified in line with what they assessed themselves as being. This ensured that the FH specific QoL scale they were directed to had face validity, as the scale matched with the participant's belief regarding their own reaction. It also allowed for an exploration of misunderstandings regarding food allergy, intolerance of coeliac disease in the sample, based on a comparison with their responses to other questions regarding type of food, symptoms and timing of reactions.

For each of the three foods, respondents were asked to say whether they thought their FH was mild, moderate or severe. This type of self-reported rating of severity has been used in previous published studies (Acaster et al., 2020a; Acaster et al., 2020b) and has been shown to significantly correlate with QoL ratings.

Key data collected included:

- detailed information on foods, symptoms, diagnosis, medication and hospitalisation
- experiences when eating out
- quality of life (measured by valid and reliable questionnaires)

Validated psychometric scales were used to measure FH specific and generic quality of life. A full list of all scales used can be found in the technical report. The specific psychometric quality of life questionnaire respondents completed was based on their own answer to the question regarding the type of FH they perceived they suffered from. For adults, this was for the first food they told us details about. Adults reporting food allergy completed the Food Allergy Quality of Life Questionnaire for Adults (FAQLQ-A) and those reporting food intolerance completed the FIQLQ-A. Adults reporting coeliac disease completed the Coeliac Disease Quality of Life scale for adults (CDQOL).

For parents, the specific quality of life questionnaire they completed was based on their answer regarding the type of FH for the first food of the first child they told us about. For food allergy, parents completed the FAQLQ-Parent proxy for children or for teens, and food intolerance they completed the FIQLQ-Parent proxy for children and teens. Those reporting coeliac disease in their child completed the Coeliac Disease quality of life scale parent-proxy (CDDUX).

Children aged 8-12 years reporting food allergy completed the FAQLQ for children; those aged 13-17 completed the FAQLQ for teens. There was no available validated scale for children or teens with food intolerance, so we adapted the FAQLQ for children and teens using the same methodology that had been used previously to adapt the other FAQLQs for food intolerance.

Children reporting coeliac disease completed the Coeliac Disease quality of life scale for child self-report (CDDUX).

A generic quality of life scale - the EQ5D - was used to enable direct comparison across respondent subgroups. The [EQ5D generic quality of life scale](#) is a generic, preference-based health status measure. Participants report their current health on dimensions such as mobility,

self-care, pain and discomfort, usual activities, anxiety and depression. Responses are converted into a single index value that can be used in cost-effectiveness analyses, where a score of 1 represents full health and a score of 0 represents dead. Participants were also asked to rate their current health on a 0 to 100 visual analogue scale (VAS) with higher scores representing better QoL. The EQ5D is a widely used well-validated scale to measure quality of life in healthy participants and participants with various health conditions. It has also recently been used to measure quality of life in children with peanut allergy (Acaster et al., 2020a; Acaster et al., 2020b) and has been used by the FSA in previous research on foodborne diseases. Adults completed a self-report version, parents completed a parent proxy for their children, and children and teens completed the child version, the EQ5D-Y.

Further information on sampling, the survey measures and the survey methodology can be found in the technical report.

Data analysis and reporting conventions

Sub-groups used within the analysis and reporting were:

1. Respondents with food allergy only
2. Respondents with food intolerance only
3. Respondents with coeliac disease only
4. Respondents with multiple hypersensitivities which included any two (or all three) of allergy, intolerance and coeliac disease.

Participants reporting 'Other' or 'Don't know' are not reported on as a subgroup as the key interest in this research was the three main food hypersensitivities. The total number of participants who completed the survey and who were therefore included in the analysis for this report can be found in Table 1. The main data is reported separately for adults with FH, parents of children with FH, and children aged 8-17 years with FH. Descriptive information is provided for all survey questions in the form of text, tables and graphs where appropriate. Comparisons across mean scores for groups were conducted using ANOVAs, which provide an overall F value to tell you if there is a significant difference. The effect size (η^2) was also reported for all ANOVAs. Pearson's correlations were used to examine relationships between pairs of continuous variables. Correlations are used to see if two sets of data are related in some way, so for example to see if higher scores in a variable is related to higher or lower scores in another variable. Where group sizes were big enough regression analysis was then conducted to see what variables might predict QoL.

For the QoL measures, the following comparisons were made for each group where appropriate:

- between clinically diagnosed ([footnote 3](#)) and self-diagnosed
- by gender
- by age
- by number of foods/allergens reported
- self-reported severity

For participants who had completed wave 1 and wave 2, answers to survey questions were compared for changes over time where there were sufficient numbers in each group.

Results were reported as significant if $p < 0.05$. This indicates that we can be 95% confident that the results did not come about by chance. Where there were multiple comparisons a Bonferroni correction was applied to them, to reduce the risk of stating a difference was significant when it was not. Where this was applied, a corrected α level was used to determine significance (0.05 divided by the number of comparisons). All tests were two-tailed. Effect sizes were reported for all analyses. Findings were not weighted due to the lack of available food hypersensitivity

population information.

Table 1: Number of participants completing wave 2

Participant group	Adults N (%)	Parents of children N (%)	Children N (%)
Respondents with food allergy only	323 (30.3)	399 (53.2)	141 (40.4)
Respondents with intolerance only	330 (31.0)	176 (23.5)	139 (39.8)
Respondents with coeliac only	217 (20.4)	21 (2.8)	29 (8.3)
Respondents with multiple hypersensitivities	131 (12.3)	134 (17.9)	21 (6.0)
Respondent reporting 'other' or 'don't know'	64 (6.0)	20 (2.7)	19 (5.4)
Total	1,065 (100)	750 (100)	349 (100)

1. [The FSA's Food Hypersensitivity Strategy, 2019-2025](#)
2. The [preferences of those with food allergies and/or intolerances when eating out study](#).
3. Clinical diagnosis included a health care professional making a diagnosis based on a clinical history, skin prick tests, blood tests and/or food challenge.

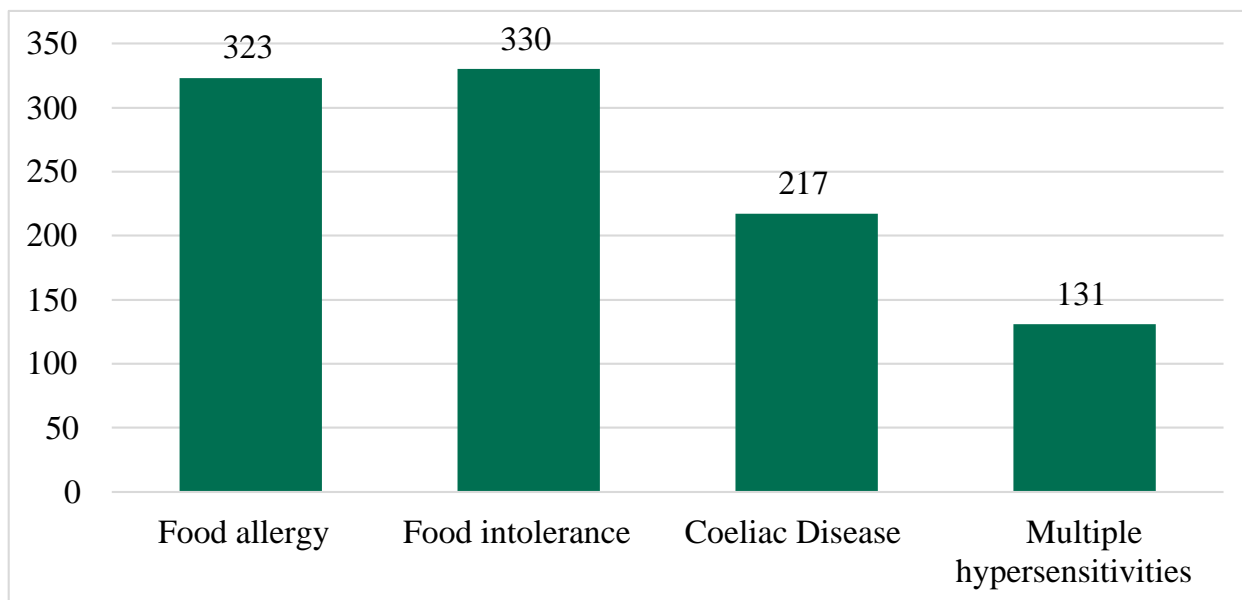
Part 1: Adults with Food hypersensitivities

A total of 1,065 adults with FH completed the wave 2 survey, which included 64 reporting 'other' conditions or 'don't know' when asked to describe their reaction to food. These participants are not reported on in analysis as a subgroup but are included in the 'all adults' figures. Of these 1065 adults, 313 were adults who had previously completed a survey at wave 1 (for key comparisons of these samples see pages 53-57 and Table 25).

Prevalence of food hypersensitivities

Approximately a third of the adult sample was made up of those with food intolerance (31%) a third with food allergy (30%) and almost a fifth with coeliac disease (18%).

Figure 1: Prevalence of adults within the sample with each food hypersensitivity



Base: All adults excluding 'other' and 'don't know' (1001)

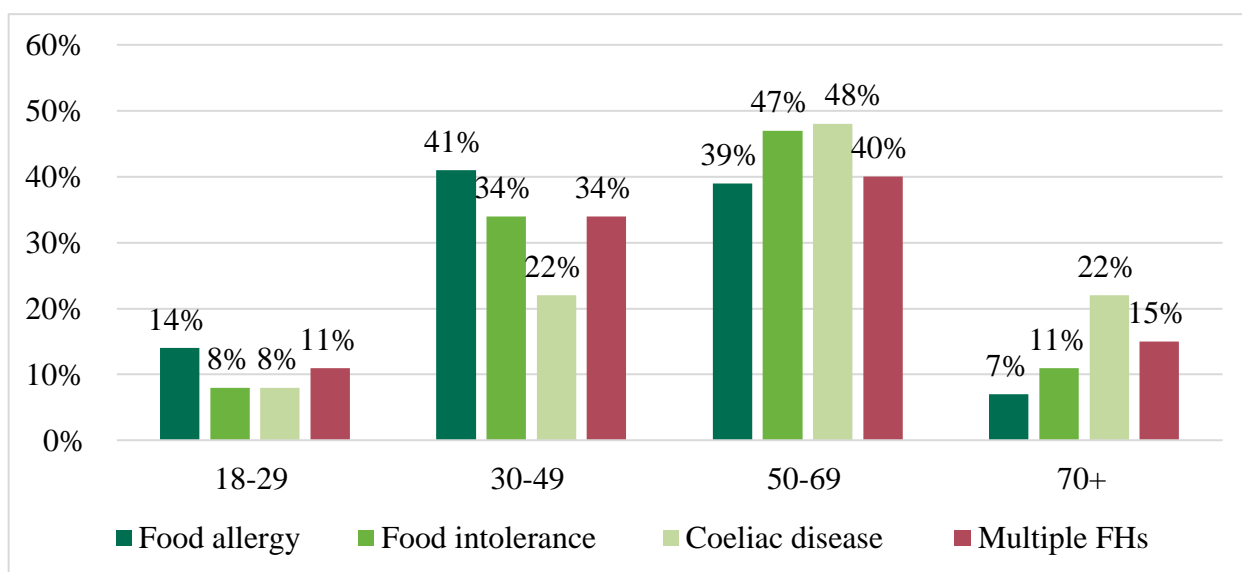
Profile of adult participants

Key demographics

From a total of 1,065 adults, 76% (n = 812) of those reporting a food hypersensitivity were women (23%; n = 245 were men). The mean age of all participants was 51 years old (SD = 15.2), with a range from 18 to 86 years old. The majority of adults were of White British ethnicity (n = 915; 86%). (See Annex A: Table 4).

Participants with a food allergy were typically younger (mean age: 46.9 years old; SD = 15.0) than those reporting a food intolerance (mean age: 52.2 years old; SD = 14.3), coeliac disease (mean age: 55.8; SD = 15.6) or multiple hypersensitivities (mean age: 51.6; SD = 15.5; Figure 2 for age distribution).

Figure 2: Age distribution by hypersensitivity



Base: all adults (excluding 'other' and 'don't know') 959; Food allergy (308); Food intolerance (316); Coeliac disease (213); Multiple FHs (122).

More women also reported each of the four hypersensitivities than men, reflecting the large proportion of women who responded to the survey. Similar to the overall sample average, across hypersensitivities, the majority of adults were from a White British background, meaning the sample may not be representative of all those with food hypersensitivities (see Annex A Table 4 for a full breakdown).

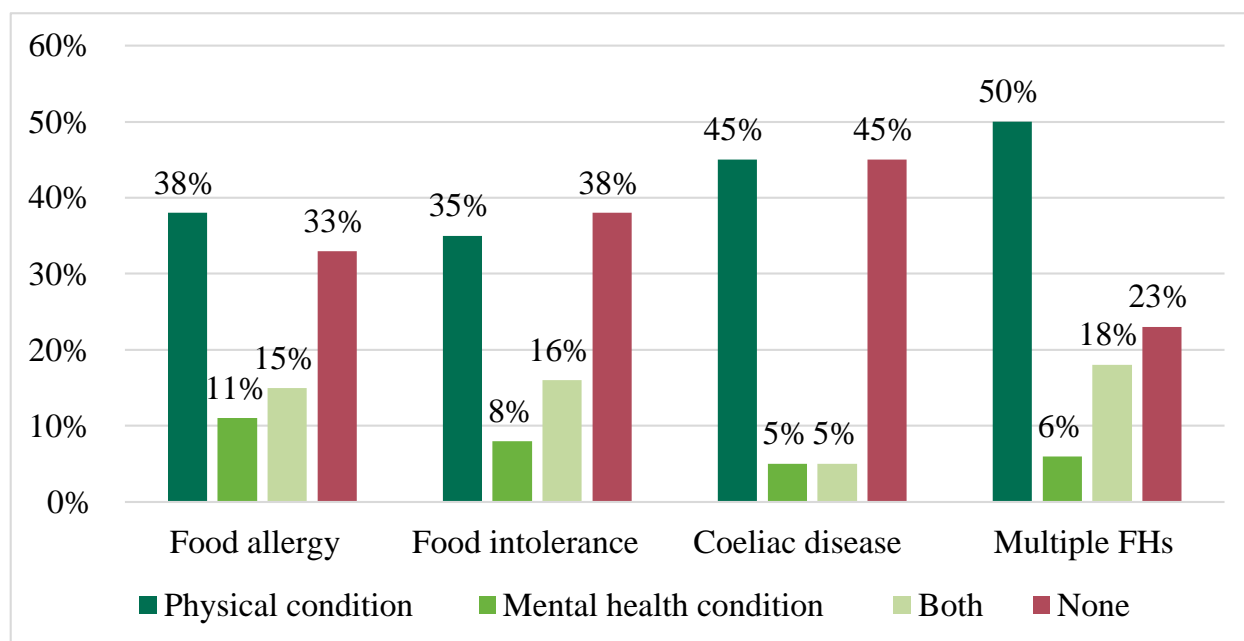
The most common region for adult respondents living with a food hypersensitivity was the South East of England (n = 202, 19%; see Annex A Table 5). Approximately a third (n = 313, 29%) had an undergraduate degree.

Thirty-three percent (n = 347) of the sample were in full-time employment, 25% (n = 267) were retired and 18% (n = 192) were working part-time. Only 3% (n = 36) were unemployed (see Annex A Table 6 for a full breakdown). Across the hypersensitivities, those with food allergy (n = 118, 38%), food intolerance (n = 104; 32%) and multiple hypersensitivities (n = 44, 34%) had the highest percentage in full-time employment, whilst those with coeliac disease (n = 91, 42%) were most likely to be retired.

Other long term conditions

Other long-term conditions included both mental and physical conditions. Forty percent of the whole sample reported a physical condition (n = 425), 8% (n = 89) reported having a mental health condition and 14% (n = 146) reported having both a physical and mental health condition. Participants with multiple hypersensitivities had the highest proportion of those reporting a physical health condition (50%), whereas those with food allergy reported the highest proportion of those with a mental health condition (11%).

Figure 3: Other long-term conditions

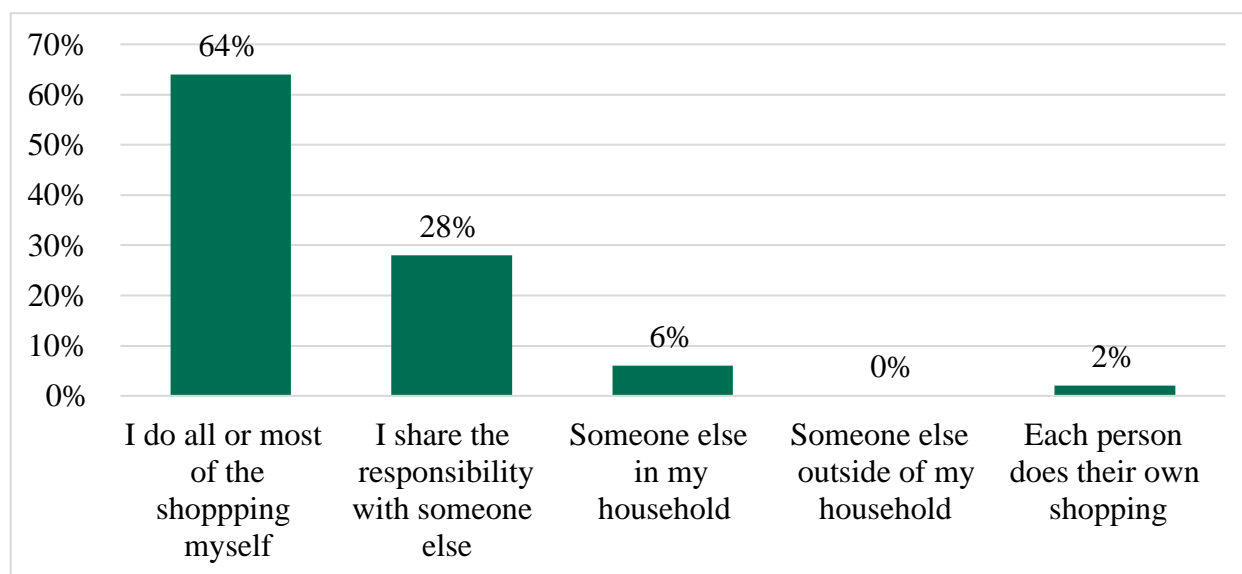


Base (all adults excluding 'Other' and 'Don't know') 997; Food allergy (321); Food intolerance (329); Coeliac disease (217) and Multiple hypersensitivities (130).

Food preparation

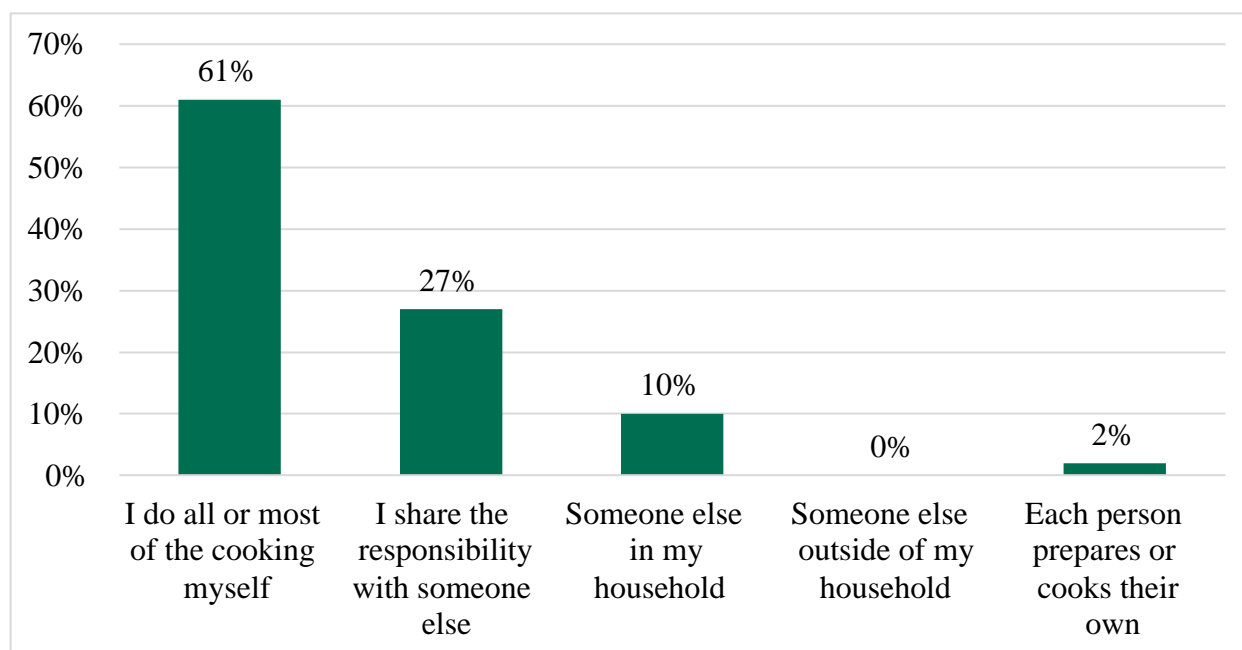
Data was collected on different aspects of food preparation, such as who did the shopping and cooking in each participants' household (Figures 4 and 5). The majority of all participants did the shopping (64%) and cooking themselves (61%).

Figure 4: Responsibility for food shopping



Base: All adults (1,060)

Figure 5: Responsibility for food preparation and cooking



Base: All adults (1,045)

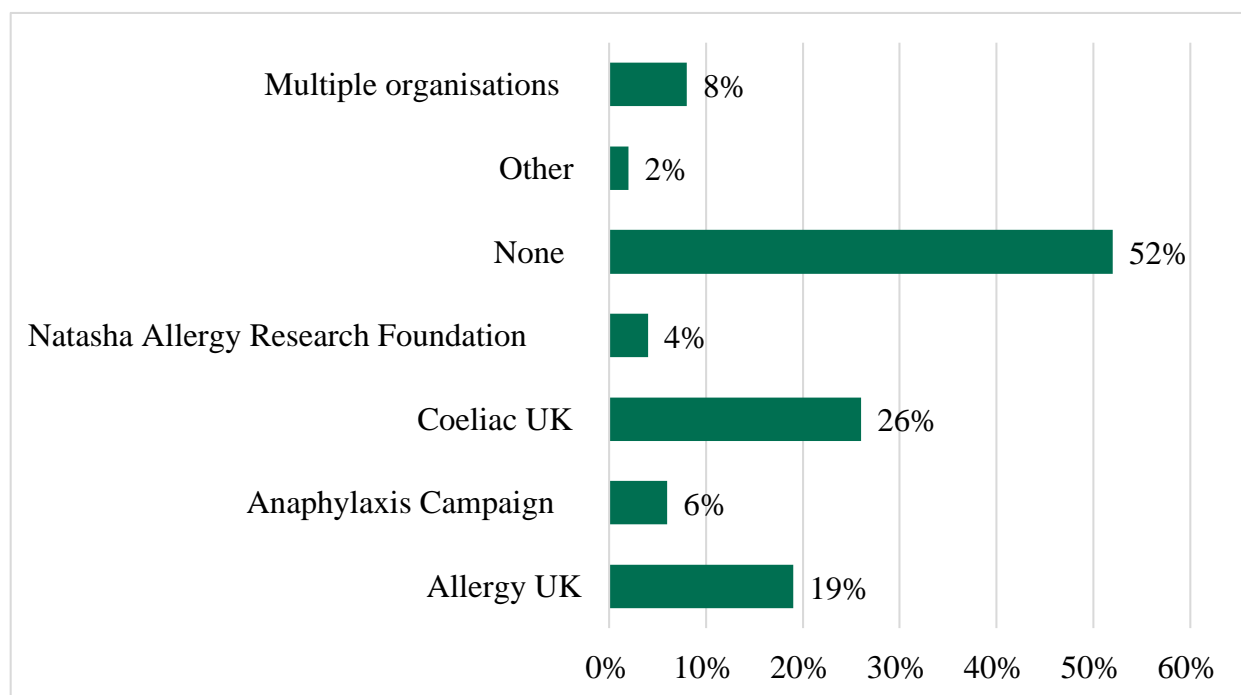
These proportions were also similar for each of the food hypersensitivities, with the majority of participants shopping and cooking for their own food or sharing the responsibility with someone else.

Patient organisation membership

Participants were asked to report on whether they were a member of any patient organisations. As one of the primary recruitment methods to the study was through patient organisations, 48% adults were members of established organisations supporting those with food hypersensitivities, especially Coeliac UK (26%) (see Figure 6) ([footnote 1](#)). It is possible that these respondents are likely to be highly informed about their condition and have been more motivated to take part in the survey.

Membership differed according to hypersensitivity; the majority of adults with food allergy (60%) and food intolerance (77%) were not members of a patient organisation, whereas the majority of those with coeliac disease (88%) and multiple hypersensitivities (69%) were members.

Figure 6: Membership of patient organisation groups (%)



Base: All adults (1,065)

Reactions to food

Initially, participants were provided with a list of foods and asked to select all foods they experienced a bad or unpleasant physical reaction to, and there was no limit on the number of foods that could be reported here. Cereals, milk, fruit and vegetables were the most frequently reported foods, as well as 'Other' foods, which included meats and meat replacements, fish, herbs and spices (for example, chilli), cheese, pulses, chocolate, condiments (for example, honey, mayonnaise), dairy products, alcohol, coconut, colourings, artificial sweeteners/flavourings, and tea/coffee. Please see Table 7 (Annex A) for a full breakdown of frequencies of foods reported by hypersensitivity.

Participants were then asked to report the foods they experienced reactions to that had a big impact on their lives. Participants could report up to three individual foods, and the reactions they experience in relation to these, in more detail. Most respondents only reported experiencing an adverse reaction to one food (n = 720, 68%), however, 206 (19%) participants reported a second food and 139 (13%) reported three foods.

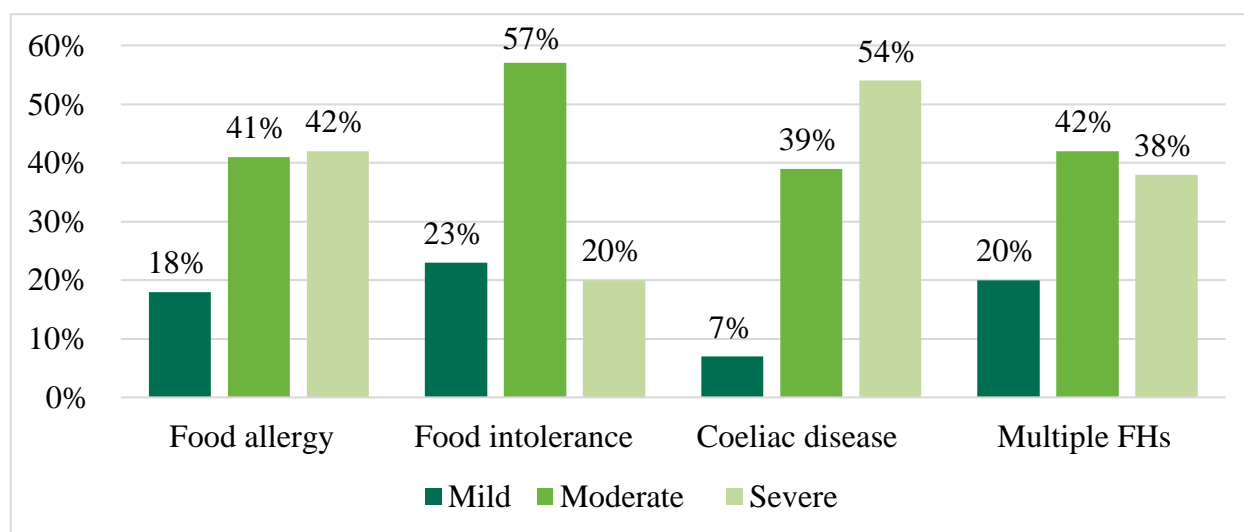
Food with adverse reactions

A total of 1,549 foods were reported individually (please note this is not separate types of food but the number of foods reported in total by adults). The most common food reported was cereals containing gluten (n = 403; 26%), and 92% of those with coeliac disease reported this as their only allergen. However, there were some other foods (8%) that those self-identifying as having coeliac disease also reported, which may not strictly result in a coeliac reaction (for example, molluscs).

Milk (n = 178; 11%) and 'other' (n = 222; 14%) foods were also common sources of adverse reactions. A reaction to milk (47%; n = 83) and 'other' foods (37%; n = 82) was most commonly reported by those with food intolerance. For a full breakdown of foods by hypersensitivity please see Annex A, Table 8.

Respondents were asked to report whether they thought their reaction to the stated food was mild, moderate, or severe, as part of the self-report questionnaire. No objective measures or definitions were given of what was classed as mild, moderate, and severe and this was left to the interpretation of respondents. Most reactions to food were self-reported as severe or moderate (36%, n = 558 and 46%, n = 714 respectively). Only 18% (n = 272) of reactions were categorised by respondents as mild (Figure 8). For food intolerance and multiple hypersensitivities, more participants reported their reactions as moderate compared to mild and severe. For those with coeliac disease, the majority reported this as severe and for those with food allergy, this was split between moderate and severe (Figure 7).

Figure 7: Severity of reaction to all foods reported, by hypersensitivity



Base: All foods reported by adults with hypersensitivities (excluding 'other' and 'don't know'; 1439); Food allergy (465); Food intolerance (429); Coeliac disease (230); Multiple FHs (315).

Symptoms

Participants reported a wide range of symptoms, which were grouped into breathing (for example, coughing/sneezing, wheezing, breathless), skin (for example, rash, itchy, dry skin, swelling of face, eczema), gastrointestinal (for example, abdominal pain, sickness/vomiting/diarrhoea, loss of weight), mouth/throat/ ear symptoms (for example, tingling/itching, tight throat, tongue swelling) and other reactions (for example, anaphylaxis, incontinence, collapse or seizure). Participants could choose all symptoms relevant to their reactions, so numbers reflect how many times each symptom type was chosen by respondents.

Across the three foods respondents could report on, the majority of symptoms typically experienced were gastrointestinal (44%; n = 4183). Similarly, across all three foods reported on, for those with food intolerance (64%; n = 1180), coeliac disease (82%; 1052) and multiple hypersensitivities (47%; 936) the most common symptoms were also gastrointestinal symptoms. However, for those with food allergy, the most common symptoms reported were breathing symptoms (28%; n = 1053) (see Annex A Tables 9-11 for a full breakdown).

When asked to report the most severe symptoms they had experienced to the foods they reported, for adults with food intolerance (62%; n = 762), coeliac disease (80%; n = 585) and multiple hypersensitivities (46%; n = 612) gastrointestinal symptoms were reported as the most common severe symptoms. For adults with allergy, the most common severe symptom type was breathing symptoms (25%; n = 611; Annex A Table 12).

Participants reported that their symptoms most frequently started between 5 to 30 minutes (n = 451; 30%) after ingesting the stated food. However, for those with food intolerance (n = 211; 51%), coeliac disease (n = 157; 69%) and multiple hypersensitivities (n = 131, 41%) symptoms more frequently occurred after 30 minutes. For those with food allergy, symptoms most commonly started within 5 minutes (n = 216, 47%; Annex A Table 13).

Diagnosis

Across all three foods reported, the majority of respondents with food allergy (75%) or coeliac disease (97%) reported their reactions as clinically diagnosed (both diagnosis methods and the healthcare professional who diagnosed them were clinically based). Whereas, the majority of those with food intolerance reported that their reactions were self-diagnosed (diagnosed by themselves only; n = 226, 56%; Figure 8). A small number of adults across the hypersensitivities reported that they had been diagnosed by an alternative therapist (n = 27; 2%).

The majority of reactions reported by adults were diagnosed by a hospital doctor, GP, or nurse (n = 775 combined, 58%). The most common method of diagnosis was a blood test for antibodies (n = 315, 17%) and a healthcare professional's diagnosis without any tests (n = 312, 17%; see Annex A, Table 14). 'Other' tests were also reported by 15% (n = 276) of adults which included unexpected anaphylaxis or other reaction, diagnosis when they were a child, or as a co-morbidity of another condition. Other diagnostic tests, such as endoscopy, biopsy and elimination diets were also reported for 'Other'. Twenty-eight percent (n = 507) of the sample reported that they had noticed symptoms themselves as one of their diagnosis methods. However, participants could choose multiple options for diagnosis method, which may have included a clinical method such as blood tests in addition to reporting that they had noticed the symptoms themselves. Only those who reported just noticing the symptoms themselves, or diagnosing themselves were classed as self-diagnosed.

Figure 8: Diagnosis by hypersensitivity

Base: All foods reported by adults with hypersensitivities (1386); Food allergy (442); Food intolerance (404); Coeliac disease (230); Multiple FHs (310).

When focussing on diagnosis methods only, by hypersensitivity those with food allergy most often reported being diagnosed by a healthcare professional (n = 122; 22%), or noticing symptoms themselves (n = 120; 21%) as one of their diagnosis methods. For those with coeliac disease, it was 'Other' (n = 127; 44%) methods of diagnosis. For participants with food intolerance (n = 230; 51%) and multiple hypersensitivities (n = 101; 28%), noticing the symptoms themselves was the most common diagnosis method reported. (Note: these numbers are different to the groupings as shown in Figure 8, which reflect the combined categorisation based on both diagnosis method as well as the healthcare professional adult participants were diagnosed by. Here, it is just the diagnosis method which is reported on.)

Mean age for diagnosis was 33.5 years old (SD = 17.9) when looking at the first food that adults had the most significant reaction to ([footnote 2](#)). Respondents with food allergy were, on average (mean = 25.7, SD = 16.8), diagnosed significantly younger than respondents with other hypersensitivities (food intolerance mean = 34.9, SD = 16.3; coeliac disease mean = 40.3, SD = 17.0; multiple hypersensitivities mean = 34.6; SD = 18.3) $F(3) = 31.5, p < .001, \eta^2 = .08$ (all comparisons, $p < .001$).

About their reaction

Participants were asked how many times they had reacted to the food in the previous 12 months. Across all foods reported, for 36% ($n = 542$) of reactions, the sample reported that they had not reacted to their stated food in the previous 12 months, however 58% ($n = 882$) of reactions had occurred in the last 12 months, with 17% ($n = 257$) occurring between 3 and 6 times, and 13% ($n = 193$) occurring once. On a scale from 1 (not reacted to this food in the last 12 months) to 6 (more than 10 times), participants with food intolerance reported they had reacted to food significantly ([footnote 3](#)) more often in the last 12 months (mean = 3.3, SD = 1.8) on average reporting they had experienced two reactions in the previous 12 months, compared to those with food allergy (mean = 2.4, SD = 1.6), coeliac disease (mean = 2.6, SD = 1.6) and multiple food hypersensitivities (mean = 2.7; SD = 1.7), who reported reacting once in the last 12 months (all $p < .008$; Annex A Table 15).

Additionally, participants were asked where they were when their most recent reaction to the food reported occurred (for example, where they first started experiencing symptoms of an adverse reaction). Across all foods, 62% ($n = 901$) of reactions occurred at home, however 14% ($n = 204$) also occurred whilst eating out. Participants were only asked where their reaction occurred however (for example, where they first started to experience symptoms of an adverse reaction), and not where the food they reacted to was prepared. Seven percent of reactions were also reported to have occurred at work ($n = 106, 7\%$) or a family or friend's house ($n = 100, 7\%$), 5% ($n = 80$) occurred at other locations, for 3% ($n = 49$) participants couldn't remember the location and 1% of reactions occurred on public transport ($n = 21$). This was also reflected across the hypersensitivities (see Annex A, Table 16).

Anaphylaxis

The total number of reactions where participants reported experience of anaphylaxis ([footnote 4](#)) was 351 (24%), of which 57% ($n = 201$) were those with food allergy and 26% ($n = 91$) were those with multiple food hypersensitivities. A further 12% ($n = 42$) reporting this had food intolerance and 1% ($n = 4$) were those with coeliac disease. For 14% ($n = 213$) of all reactions, participants had also experienced anaphylaxis in the last 12 months, of which 45% ($n = 96$) were those with food allergy and 30% ($n = 64$) were those with multiple hypersensitivities, indicating those with food allergy in this sample were most at risk of anaphylaxis (see Annex A, Tables 18 and 19). Fifteen percent ($n = 33$) of those experiencing anaphylaxis in the last 12 months were those with food intolerance and 2% were those with coeliac disease. However, given that anaphylaxis is not a typical reaction for coeliac disease or food intolerance, some respondents may have incorrectly reported this reaction, or possibly misdiagnosed their hypersensitivity or misunderstood the question, despite being given a definition.

Furthermore, for 27% ($n = 403$) of all foods reported, participants had been prescribed an adrenaline auto-injector (AAI). This was mostly reported by participants with food allergy (62% of those prescribed an AAI, $n = 248$), though it was also reported by respondents with multiple food hypersensitivities (22%, $n = 90$).

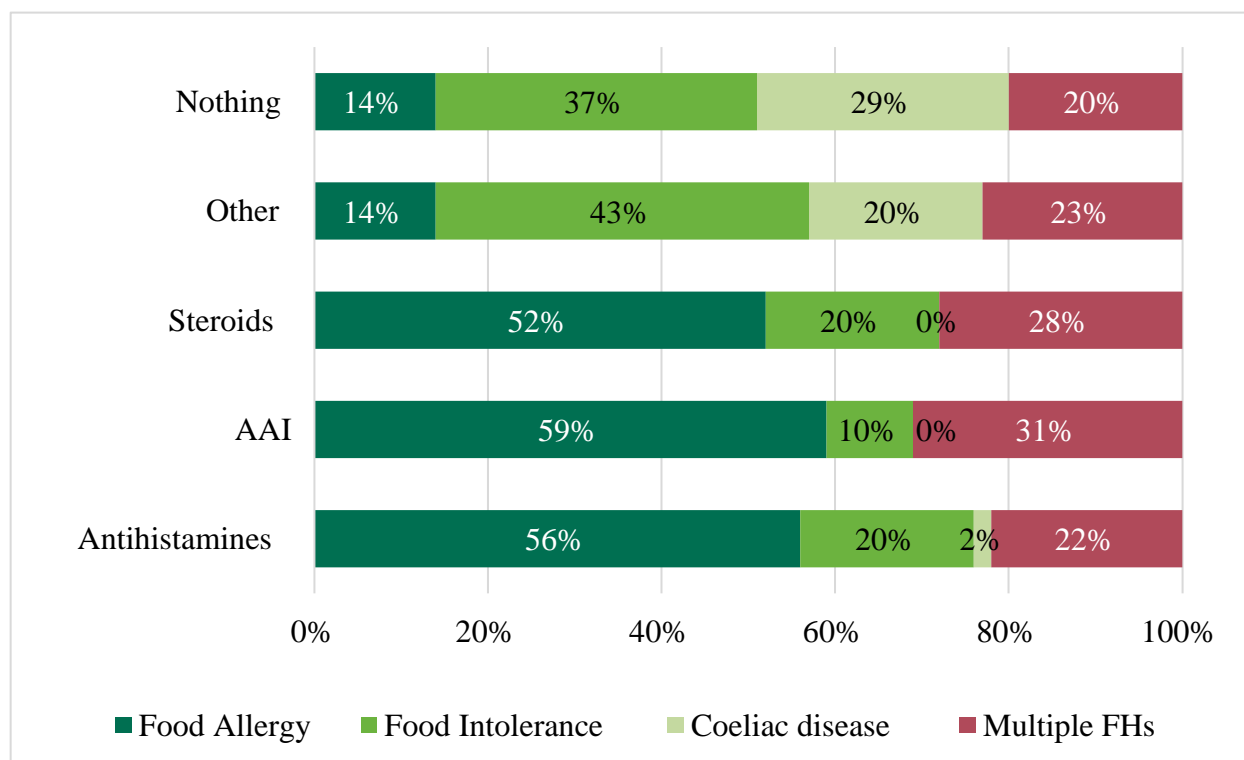
Treatment

Participants were asked about different aspects of treatments to their most recent reactions, including who treated them. Across all reactions reported on, 74% of adults reported that they treated the reactions themselves, with 15% also reporting that they received medical help. Across hypersensitivities, those with food allergy (n = 114, 24%) and multiple hypersensitivities (n = 47, 15%) reported higher frequencies of seeking medical help for treatment of their reaction, than those with food intolerance (n = 39, 9%) and coeliac disease (n = 9, 4%; see Annex A, Table 17).

Participants could select all applicable treatments administered themselves or by a non-medical person for their stated food hypersensitivities. Just over a third (36%, n= 462) reported not taking anything. The most common treatment reported across all foods was antihistamines (n = 426; 33%). Treatments were most commonly reported by those in the food allergy group (see Figure 9).

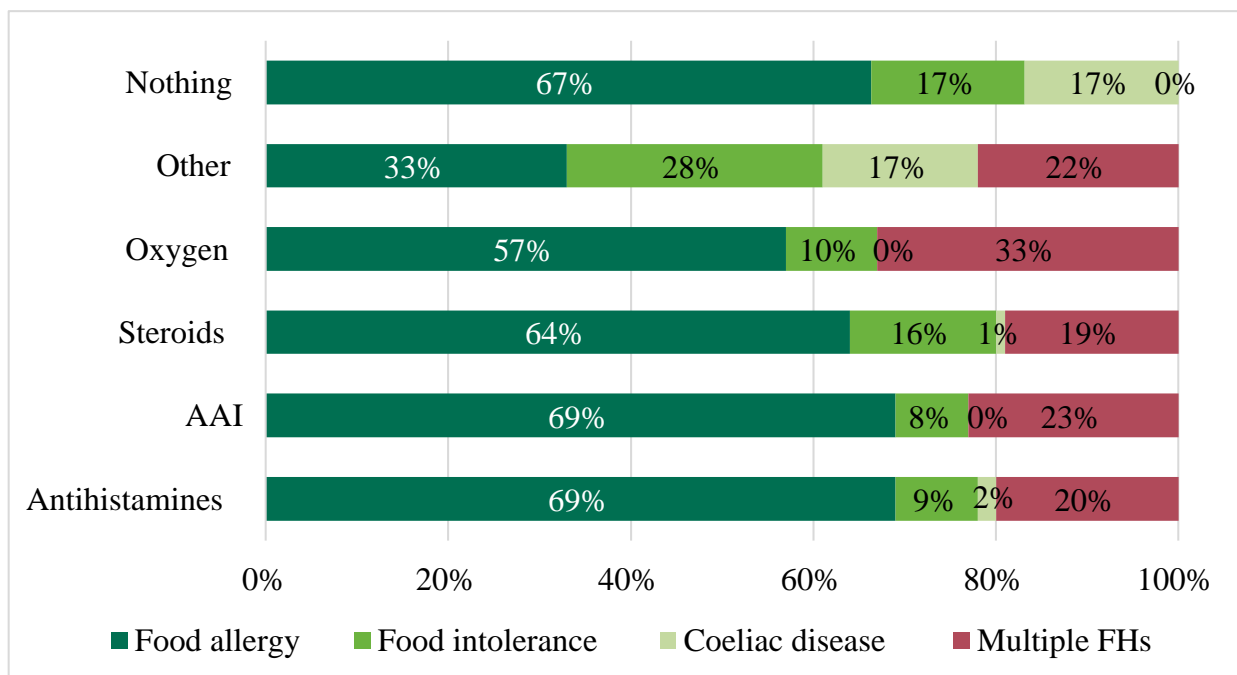
Participants also reported on treatments administered by a medical professional. Of these, antihistamines (n = 116, 29%) were the most commonly administered treatments across all reactions reported on. Across hypersensitivities, those with food allergy received more treatments than other hypersensitivities (see Figure 10).

Figure 9: Treatments by non-medical persons for reaction to all foods reported, by hypersensitivity



Base: All adults (excluding other and 'don't know'; 1201): Food allergy (380); Food intolerance (368); Coeliac disease (183); Multiple hypersensitivities (270).

Figure 10: Treatments by medical professionals for all foods reported, by food hypersensitivity



Base: All adults (excluding other and 'don't know'; 370): Food allergy (232); Food intolerance (47); Coeliac disease (10); Multiple hypersensitivities (81)

Hospital admission

For the majority of foods reported (84%, n = 1,225) participants had never had to call an ambulance, and three quarters (78%, n = 1142) had never been admitted to hospital as an emergency for their reactions to their stated food. For those reactions where participants had been admitted to hospital (n = 316, 22%), three quarters (75%, n = 221 of those responding n = 296) were admitted the first time that they reacted to their stated food and 24% (n = 75) were admitted just once. Adults with food allergy were the most likely to be admitted to hospital for their reactions to their stated food (n = 159; 37% of those with food allergy and 50% of all those admitted), followed by those with multiple hypersensitivities (n = 78; 25% of respondents with multiple FH and 25% of all those admitted) and those with food intolerance (n = 42; 10% of respondents with food intolerance and 13% of all those admitted). Those with coeliac disease were least likely to be admitted (n = 21; 7%).

For all groups, the majority of participants who had been admitted to hospital (n = 144), had been admitted between once and 3 to 6 times (n = 123, 85%). Across hypersensitivities it was most common for participants to report reacting once, with those with allergy reporting this more compared to other groups (n = 42; 56% of those being admitted once; see Annex A Table 20 for full breakdown). Those from the food allergy group were most likely to be admitted the first time they reacted to their stated food (n = 114, 52% of those admitted first time), compared to those with food intolerance (n = 26, 12%), coeliac disease (n = 5, 2%) or multiple hypersensitivities (n = 64, 29%; Annex A Table 21).

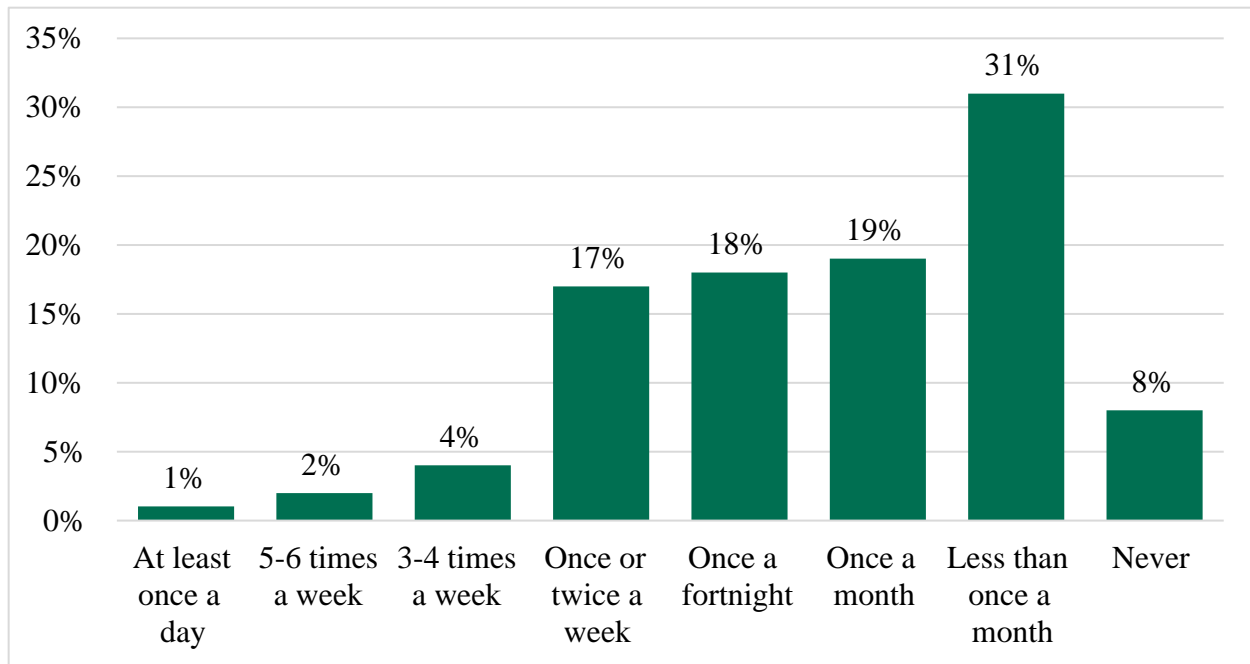
Eating out

Participants were asked how often they eat out, and how comfortable they feel with various aspects of eating out, such as asking for information from a member of staff. Respondents were asked about their current eating out behaviour.

A third of participants reported that they eat out or get food to take away from a restaurant or other food outlet less than once a month (n = 313, 31%), but over half of the overall sample

reported they eat out more frequently than this (n = 601; 60%; Figure 11).

Figure 11: How often participants eat out or get food to take away

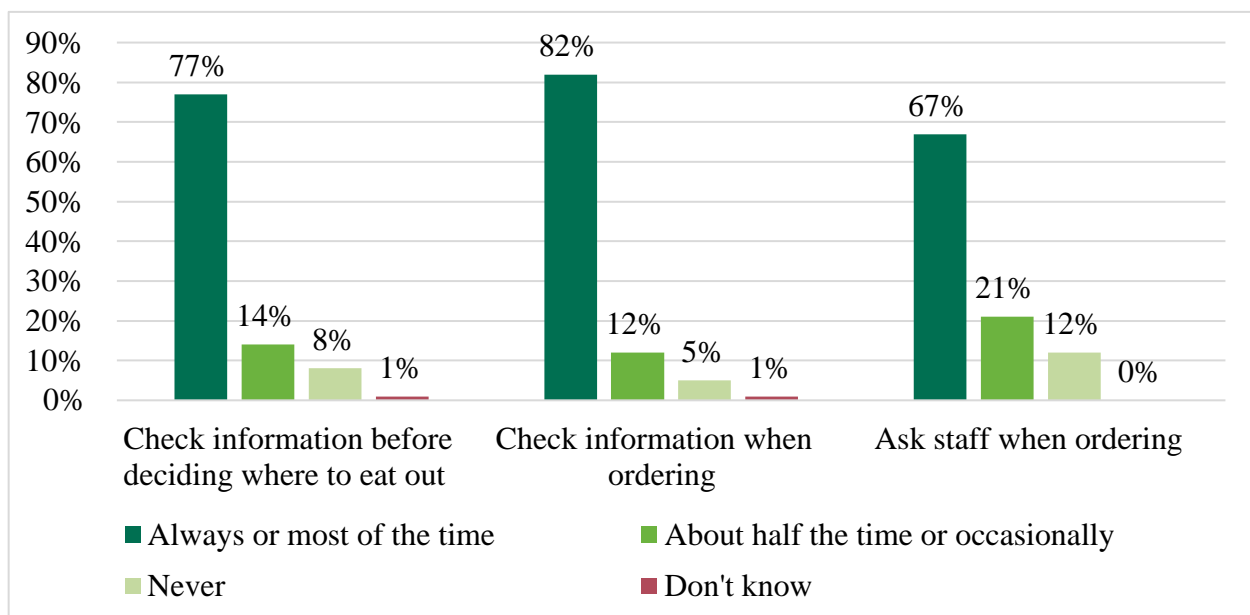


Base: All adults (996).

However, there were significant differences in how often adults with different hypersensitivities eat out, $F(3) = 4.95$, $p = .002$, $\eta^2 = .02$. On a scale of 1 (Never) to 8 (at least once a day), those with food allergy (mean = 3.6, SD = 1.6) and those with multiple hypersensitivities (mean = 3.5, SD = 1.9) reported eating out once a month or fortnight, and for those with food allergy this was significantly more often than those with food intolerance (mean = 3.2, SD = 1.5) and those with coeliac disease (mean = 3.1, SD = 1.3; all p s < .008), who on average ate out around once a month (see Annex A Table 22).

Participants reported almost always reviewing information at each stage of eating out, with a small minority never checking available information at any stage of eating out (see Figure 12).

Figure 12: How often participants review information when eating out (all adults, %)



Base: All adults answering each question; Check information before choosing where to eat out (920); Check information before ordering (913); Ask staff for information when ordering (918).

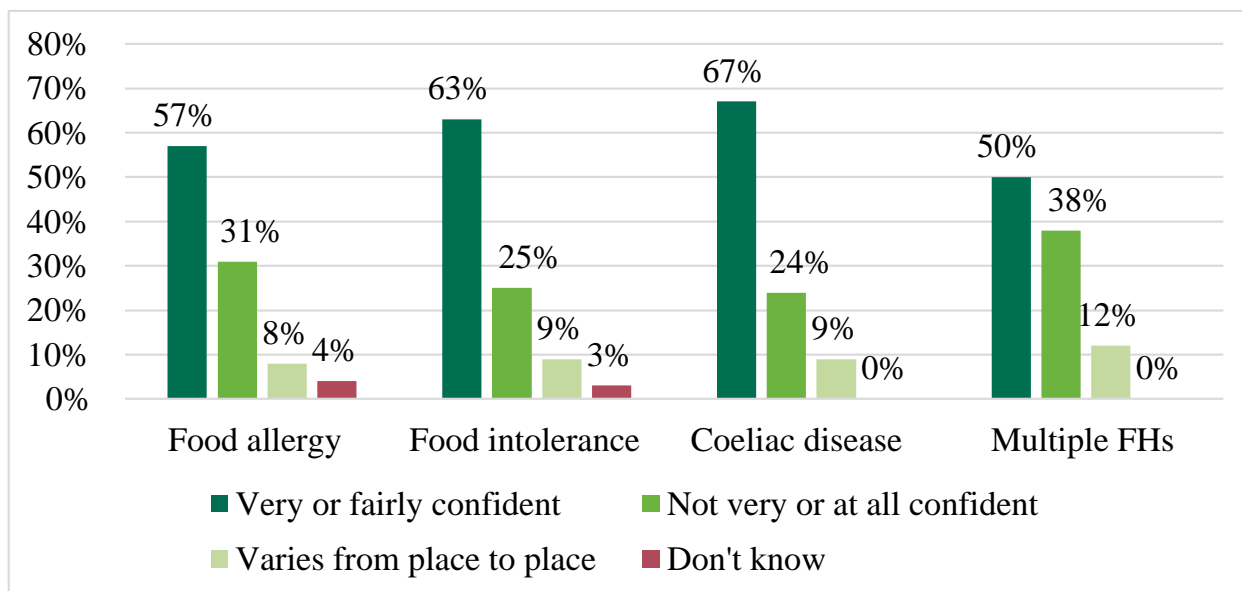
Within each hypersensitivity group, most adults reported they always or most of the time check and review any available information that allows them to identify foods that will cause a bad or unpleasant physical reaction before deciding where to eat out. However, on a scale of 1 (Never) to 5 (Always) there were significant differences between hypersensitivity groups. Adults with multiple hypersensitivities (mean = 4.5, SD = 0.9) and coeliac disease (mean = 4.7, SD = 0.7) checked information when deciding where to eat out significantly more often than those with food allergy (mean = 3.9, SD = 1.4) or food intolerance (mean = 3.7, SD = 1.4; all $ps < .008$), on average reporting that they always check this.

When asked how often participants review any available information before ordering food, adults with food intolerance (mean = 3.9, SD = 1.4) review this information significantly less often (about half or most of the time) than adults with food allergy (mean = 4.2, SD = 1.2), coeliac disease (mean = 4.8, SD = 0.6) and multiple hypersensitivities (mean = 4.6, SD = 1.0; all $ps < .001$), who review this either always or most of the time. Finally, adults with coeliac disease (mean = 4.6, SD = 0.8) and multiple hypersensitivities (mean = 4.4, SD = 1.1) on average reported asking a member of staff for information that enables them to identify foods that cause a bad or unpleasant reaction significantly more often than those with food allergy (mean = 3.8, SD = 1.4) or food intolerance (mean = 3.0, SD = 1.6; all $ps < .001$).

As well as asking how often participants check available information when they eat out, they were also asked how comfortable they felt doing so, and how confident they were that the information provided would allow them to identify foods that cause bad or unpleasant physical reactions. Over half of all participants were comfortable in asking staff for information when eating out because of a concern about experiencing a reaction ($n = 576$; 63% were very or fairly comfortable). This was the case across all hypersensitivities (64% of the food allergy, 59% of the food intolerance and 67% of the coeliac disease groups, and 64% of the multiple hypersensitivities group reported being very or fairly comfortable asking for information; see Annex A Table 23). There were no significant differences in how comfortable participants with different hypersensitivities were in asking for information, $F(3) = 1.19$, $p = .31$, $\eta^2 = .005$.

Adults were mostly confident that the written information provided when eating out allows them to identify foods that cause a reaction ($n = 549$; 60% were very or fairly confident). There were no significant differences in how confident adults with different hypersensitivities were in written information $F(3) = 0.59$, $p = .63$, $\eta^2 = .002$. See Annex A Table 24 and Figure 13.

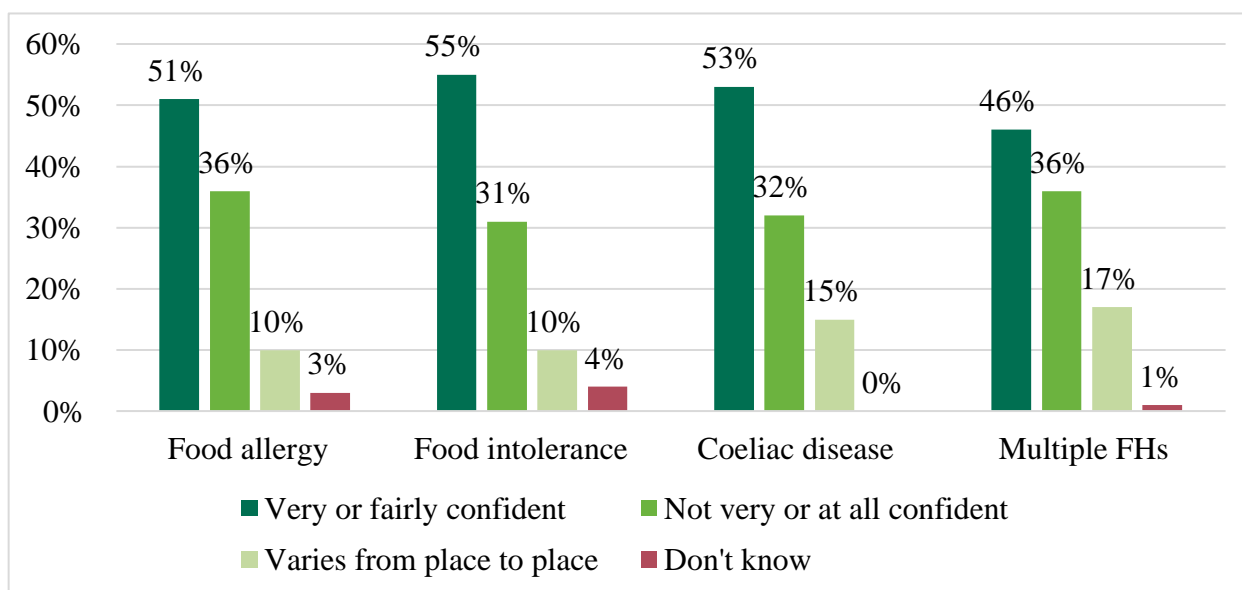
Figure 13: Confidence in written information by hypersensitivity



Base: All adults with hypersensitivities (870); Food allergy (279); Food intolerance (273); Coeliac disease (205); Multiple FHs (113).

Participants were more divided in opinion on how confident they were that the information provided verbally by staff when eating out allows them to identify foods that cause a reaction, with 52% (n = 475) very or fairly confident in information provided, but 34% (n = 312) not very or not at all confident. There were no significant differences across the different hypersensitivities for confidence in verbal information, $F(3) = 0.17$, $p = .92$, $\eta^2 = .001$ (see Annex A Table 25 and Figure 14).

Figure 14: Confidence in verbal information by hypersensitivity



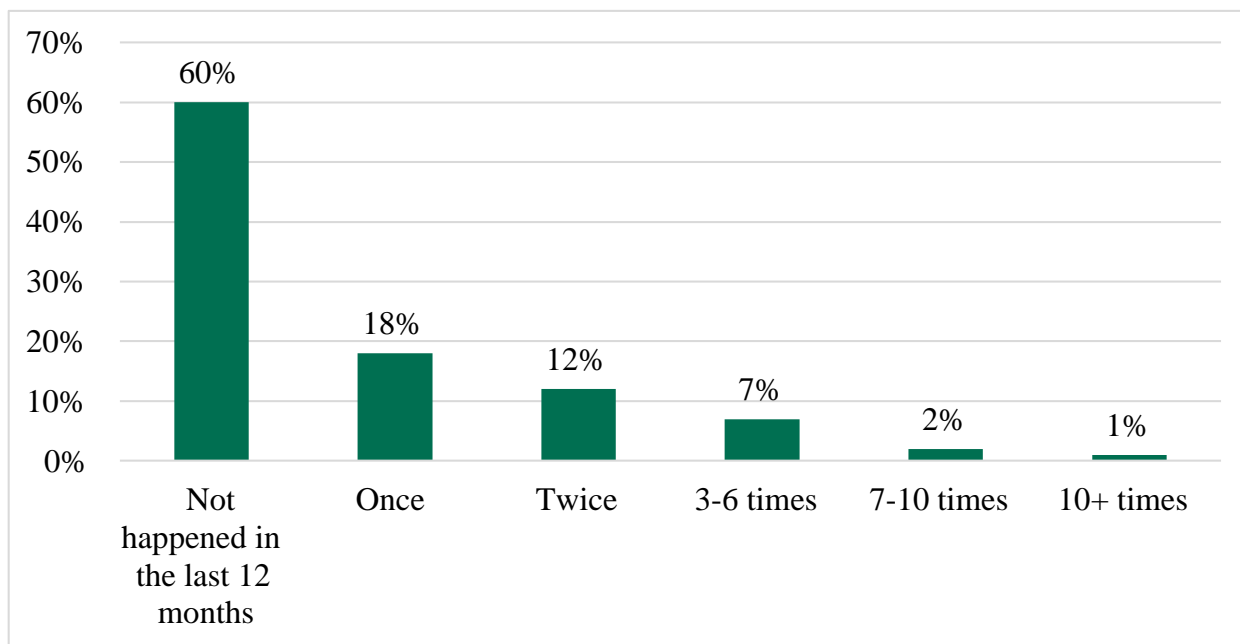
Base: All adults with hypersensitivities (870); Food allergy (279); Food intolerance (273); Coeliac disease (204); Multiple FHs (114).

Participants were also asked in the last 12 months how often they had been served a product or dish containing a food they react to, even though they had checked the available allergen information. For the majority of participants, this had not happened in the last 12 months (60%; n = 515). However, for 30% of adults (n = 260) this had happened once or twice in the last 12 months. Across hypersensitivity, those with multiple hypersensitivities (31%, n = 34) most often

reported that this had happened once and those with coeliac disease (16%, n = 32) most often reported that this had happened twice (see Table 26 and Figure 15).

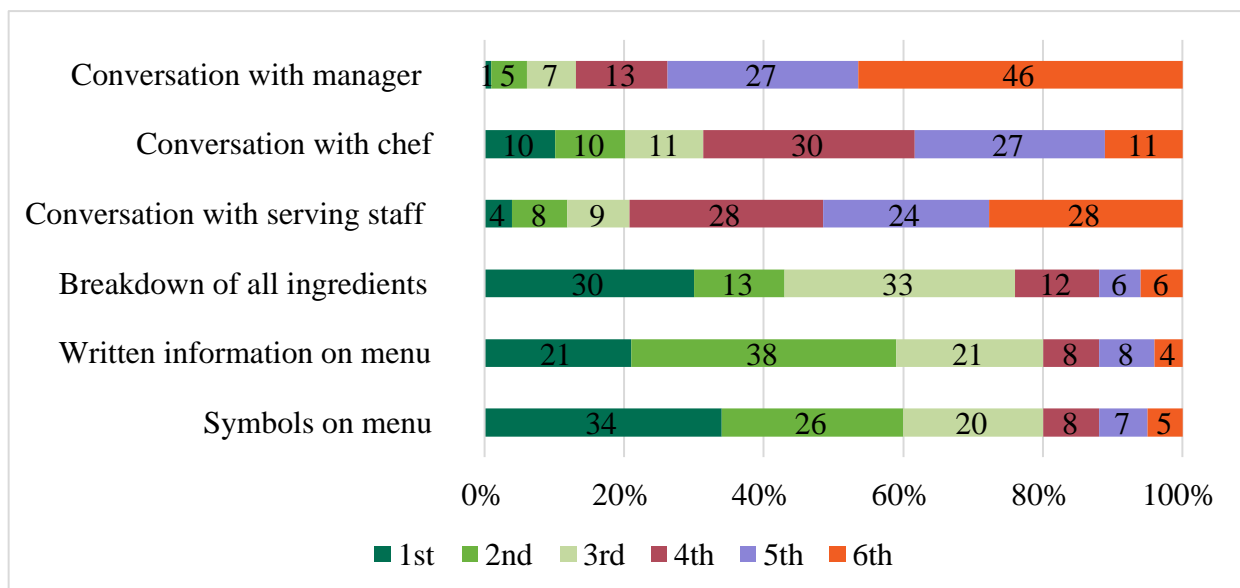
Additionally, participants were asked to rank their most useful sources of allergen information when eating out. Overall, 34% (n = 307) reported that menus with symbols showing which allergens are present in each dish are the most helpful, and a further 38% (n = 341) reported that menus with written information showing which allergens are present in each dish were the second most helpful source of information. The third most helpful source of information was a breakdown of all ingredients in each dish (33%, n = 301; see Figure 16). The same pattern was also reflected across the hypersensitivity groups.

Figure 15: Frequency of being served allergen in the last 12 months



Base: All adults (860)

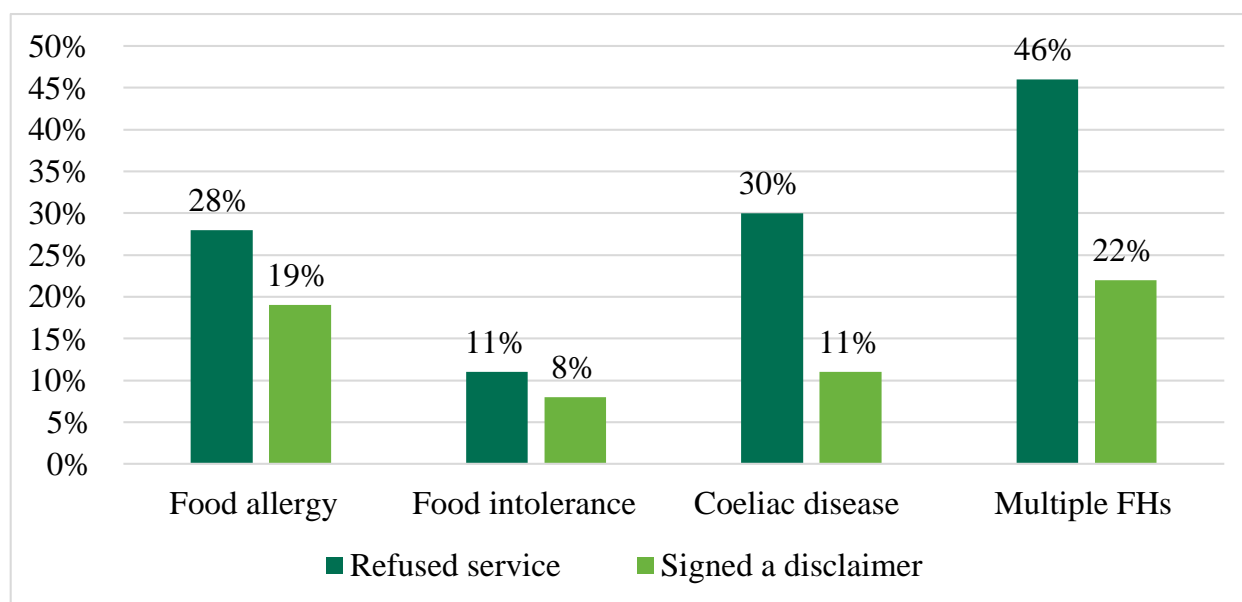
Figure 16: Rank of most useful sources of information for adults, when eating out



Base: All adults (907)

One in four (25%, n = 246) participants reported they had previously been refused service because of their hypersensitivity, and one in ten (14%, n = 116) reported that they had been previously asked to sign a disclaimer when eating out. Those with multiple hypersensitivities reported the highest percentages of being refused service (46%, n = 57) and being asked to sign a disclaimer (22%, n = 27), whilst those with intolerance reported the lowest percentages of being refused service (10%, n = 32) and asked to sign a disclaimer (8%, n = 23) as a result of their conditions. See Figure 17 for percentages reported by hypersensitivity.

Figure 17: Proportion of adult respondents refused service and asked to sign a disclaimer when eating out, by hypersensitivity



Base: Adults with hypersensitivities (Refused service (RS): 925; Signed disclaimer (SD): 929); Food allergy (RS: 295; SD: 297); Food intolerance (RS: 297; SD: 298); Coeliac disease (RS: 208; SD: 210); Multiple FHs (RS: 125; SD: 124).

Quality of life

Food hypersensitivity specific quality of life

Participants were asked to complete a health-related quality of life scale appropriate to the type of self-reported food hypersensitivity they reported for their first food. Those with food allergy completed the Food Allergy Quality of Life Questionnaire (FAQLQ) ([footnote 5](#)), those reporting food intolerance completed the Food Intolerance Quality of Life Questionnaire (FIQLQ), for Coeliac Disease participants completed the Coeliac Disease Quality of Life scale (CDQoL). Respondents reporting multiple different hypersensitivities completed the scale relevant to the first food they reported (those reporting food allergy = 49; those reporting food intolerance = 28, those reporting coeliac disease = 47). For example, if someone reported food allergy to their first food, food intolerance to their second and third, they only completed the FAQLQ as it was considered too difficult for respondents to identify the different impacts on quality of life that their different hypersensitivities may have.

Quality of life in all adults

The FAQLQ and FIQLQ are rated on a scale from 1 (least impairment on quality of life) to 7 (maximal impairment on quality of life). The CDQoL is rated on a five-point scale, with totals adding up from 20-100 and cut off points (1-20, 20-40, 40-60, 60-80, 80-100) to denote different levels of quality of life. On all scales, higher scores indicate a bigger impact on quality of life.

While it is hard to compare quality of life across the hypersensitivities using these different scales, the FAQLQ and FIQLQ used the same scale of 1 to 7, with mean impairment being 4 (response option 'moderately' on the scale from 1 to 7), and the CDQoL mean score is 50 (which would be equivalent to selecting response option 'moderately' on the 1 to 5 scale). Thus, those reporting a food allergy to their first food reported the highest score (almost 5 out of 7) above the mean of the scale, and therefore most impairment of their condition on quality of life (see Table 1).

Table 1: Mean Quality of Life scores for each FH-specific scale (all adults)

Measure	FAQLQ (Food allergy) N=345 (including 49 with multiple food hypersensitivities)	FIQLQ (Food Intolerance) N=325 (including 28 with multiple food hypersensitivities)	CDQoL (Coeliac disease) N=242 (including 47 multiple food hypersensitivities)
Mean total (SD)	4.8 (1.6)	4.2 (1.7)	50.6 (18.3)
Out of a possible total of:	7	7	100

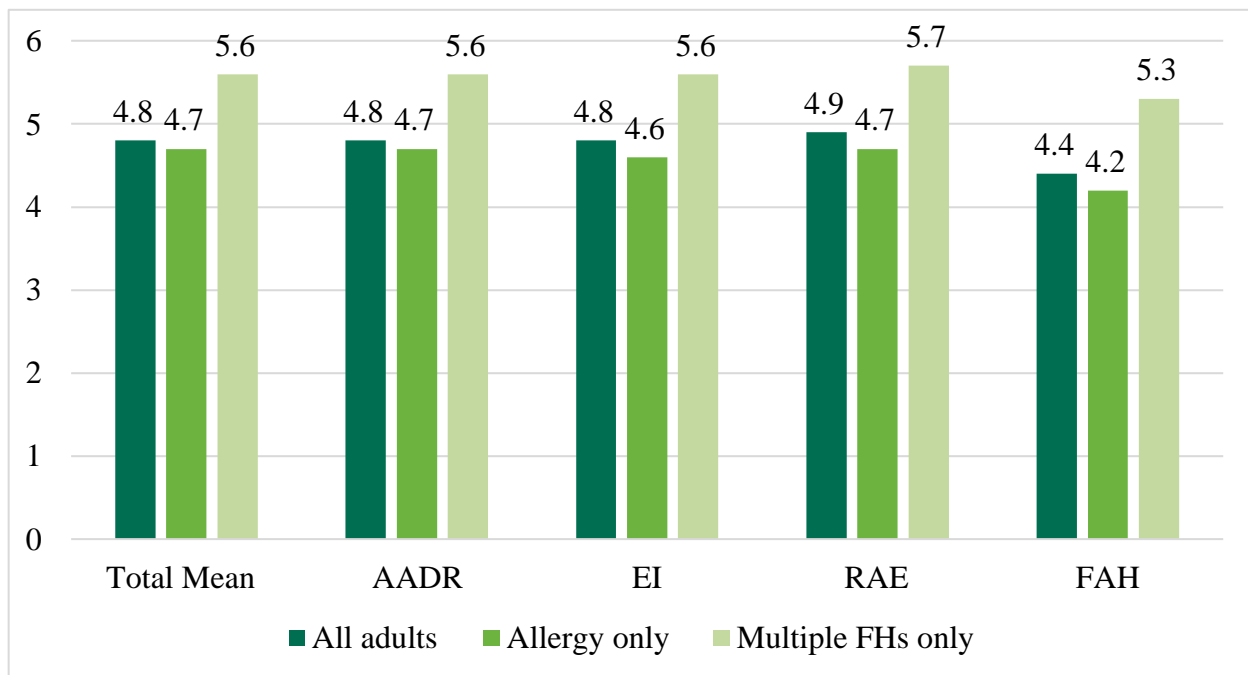
Quality of life in adults reporting allergy

Each scale consists of food hypersensitivity specific subscales. For those completing the FAQLQ, these are: Allergen Avoidance and Dietary Restrictions (AADR), which considers the impact that a restrictive diet has on quality of life and the impact this also has on social activities; Emotional Impact (EI) relating to the worries and concerns about having an allergic reaction or consuming allergens; Risk of Accidental Exposure (RAE), relating to vigilance and awareness needed to avoid ingesting allergens; and Food Allergy related Health (FAH), relating to specific health anxiety about having an allergy or reaction. A total of 345 adults completed the FAQLQ (of which 296 were from the allergy only group; the remaining 49 from the multiple hypersensitivities – see below section on this group).

On the scale from 1 (least impairment) to 7 (most impairment on quality of life) used by the FAQLQ, participants scored similarly high for total impact on quality of life and for all subscales. Scores for the total mean (4.8 out of 7, SD = 1.6; response option 'quite' troubled or worried) and all subscales of the FAQLQ were above the mean level of 4 (out of 7). The lowest mean score was for the Food Allergy related Health subscale (mean = 4.4 out of 7, SD = 1.7; response option 'moderately'), indicating less impairment on quality of life from health related anxiety about having allergies, compared to other aspects such as avoiding allergens, concerns about having a reaction and other social and dietary limitations that come with having a food allergy.

While it appears that those with multiple hypersensitivities who completed the FAQLQ had the most impaired quality of life, this group was a lot smaller than those with just food allergy and so means may be inflated for this group. Means for both groups are shown in Figure 18.

Figure 18: Mean FAQLQ scores for all adults, allergy only adults and adults with multiple hypersensitivities



Base: Adults responding to FAQLQ (345); Allergy only group (296); Those with allergy as part of multiple hypersensitivities (49).

Clinical factors were examined to see whether they were significantly associated with impairment to quality of life in adults with food allergy. Quality of life was significantly more impaired in those who reported having a long-term physical condition (for example, diabetes, heart disease, mean= 5.1, SD= 1.4) compared to those who did not (mean= 4.3 SD= 1.6; $t(204.7) = 3.85$). Additionally, those with both a mental and physical condition had significantly more impairment to quality of life (mean = 5.1, SD = 1.6), than those with no condition (mean = 4.3, SD = 1.6; $t(148) = -2.73$, $p = .007$), however group sizes were unequal so caution should be taken in interpreting these results. This was also the case for those with asthma (mean= 5.3 SD= 1.4) compared to those without (mean= 4.4 SD= 1.6; $t(302.6) = 4.80$) and for those with eczema (mean= 5.2 SD= 1.4) compared to those without (mean= 4.5 SD=1.6; $t(286.8) = 4.30$; all $ps < .05$).

The number of foods reported which result in an adverse reaction was significantly correlated with impairment to quality of life in adults reporting food allergy ($r = .42$), as was the reported severity of participants' reaction to their first food ($r = .45$; both $ps < .001$). Those prescribed an auto-injector had significantly greater impairment to quality of life (mean= 5.6 SD=1.1) than those without (mean= 4.1 SD= 1.6; $t(267.1) = 9.21$). Those who had experienced anaphylactic shock to their first stated food reported greater impairment (mean= 5.5 SD= 1.1) than those who had not (mean= 4.1 SD= 1.6; $t(223.6) = 8.53$). Those who had been admitted to hospital in an emergency for the reaction to food one also reported greater impairment to their QoL (mean= 5.4 SD= 1.2) than those who had not (mean= 4.5, SD= 1.7; $t(294.3) = 5.62$), (all $ps < .001$).

Factors related to eating out were also significantly correlated with quality of life in adults with allergy. Whilst greater frequency of eating out was significantly correlated with better quality of life ($r = -.11$, $p = .048$), how often they checked information before choosing where to eat ($r = .55$), frequency of reviewing this information before ordering ($r = .50$), and asking staff for available information ($r = .55$) were all significantly correlated to impairment of quality of life (all $ps < .001$). Being served a dish containing an allergen that participants may have a reaction to in the last 12 months was also significantly correlated with impairment of quality of life ($r = .29$, $p < .001$). Finally, however, how comfortable participants were in asking for information ($r = -.22$), and how confident they were in both written ($r = -.19$) and verbal information ($r = -.19$) were significantly associated with less impairment to quality of life (all $ps < .01$).

A regression model was run to see which of the variables described above might predict level of food allergy specific quality of life. All the variables which were significantly correlated with quality of life were included in the model ($n=17$ predictors). The overall model was significant ($p<0.001$) and 54% of the variance in quality of life was explained, indicating that 46% of the variance was due to other unknown factors. Number of foods reacted to was the strongest predictor of impairment to quality of life, with those reporting a higher number of foods reporting more impairment to their quality of life (standardised Beta = 0.33). Greater self-reported severity also significantly predicted greater impairment to quality of life (standardised beta 0.29). How often participants checked information before choosing where to eat out (standardised beta = 0.19) and how often they asked a member of staff for information (standardised beta = 0.20) also predicted poorer QoL. In addition, the frequency that adult respondents had reacted to an allergen when eating out in the last 12 months, despite checking available information also significantly predicted impairment to quality of life. None of the other predictors were significant (standardised betas ranged from -0.05 to 0.10 and confidence intervals for each predictor crossed zero).

Quality of life in adults reporting food intolerance

The FIQLQ was also scored on a scale of 1 (least impairment on quality of life) to 7 (maximum impairment on quality of life). Subscales comprise: Emotional Impact (EI), related to the stresses and concerns of having to be aware of foods that could cause a reaction; Social and Dietary restrictions (SDR), related to the impact that having an intolerance has on diet and social activities (for example, eating out); and Reactions and Avoidance (RAv), related to negative feelings about having a reaction (for example, embarrassment and discouragement). A total of 325 adults with food intolerance completed the FIQLQ.

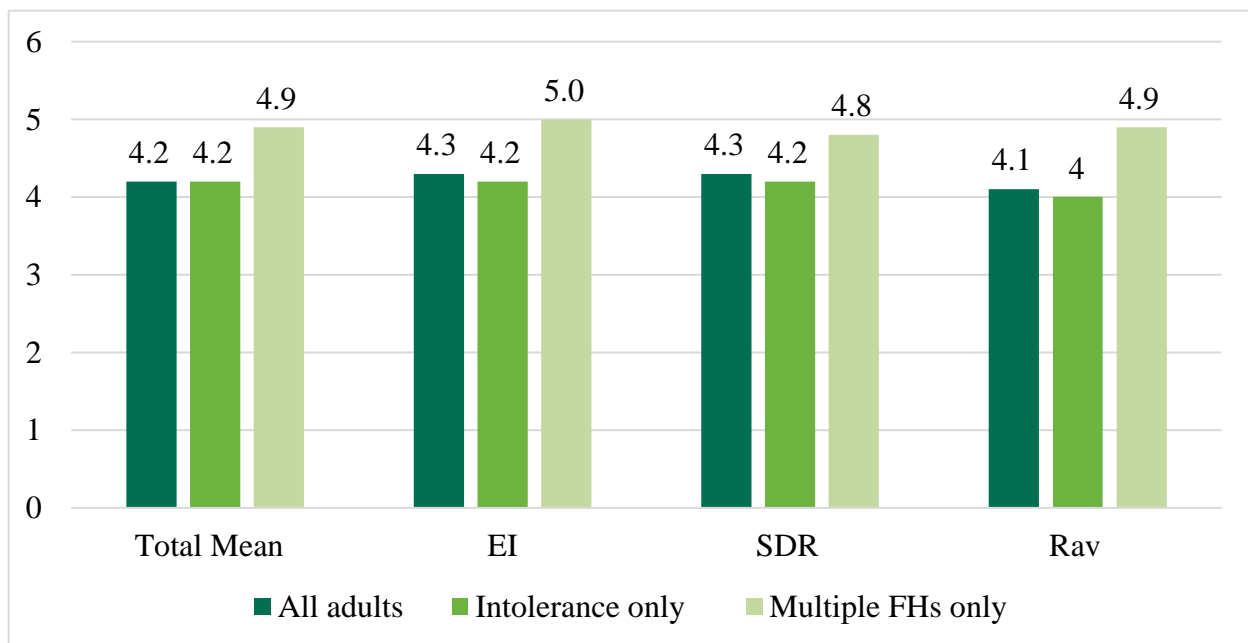
Adults with food intolerance reported a mean score of 4.2 (out of 7, response option 'moderately' or 'quite a bit'; $SD = 1.7$) for impairment on quality of life across all subscales (see Figure 19), with the mean score for Reactions and Avoidance showing least impairment in quality of life than the other FIQLQ subscales. This could indicate that those with food intolerance may be least concerned about negative feelings as a result of a reaction, and their quality of life is instead more impacted by the everyday concerns about managing their intolerance and the dietary and social limitations it has (see Figure 19).

For those with multiple hypersensitivities, 28 completed the FIQLQ. These individuals reported a greater impact on quality of life compared to those who only reported food intolerance (see Figure 19), however again this may be inflated due to the comparatively small numbers.

Quality of life was significantly more impaired in those who reported having a long-term physical condition (mean= 4.8, $SD = 1.5$) compared to those who did not (mean= 3.6, $SD = 1.6$; $t(225) = 5.62$, $p < .001$), as well as for those with both a mental health and physical condition (mean = 4.4, $SD = 1.8$, $t(165) = 2.67$, $p = .008$), although again groups were unequal and so should be interpreted with caution.

The number of foods reported which result in an adverse reaction ($r = .22$, $p < .001$) was significantly correlated with impairment to quality of life, as was the reported severity of participant's reaction ($r = .40$; $p < .001$).

Figure 19: Mean FIQLQ scores for all adults, adults with food intolerance only and adults with multiple hypersensitivities



Base: Adults responding to FIQLQ (325); Intolerance only group (297); Those with food intolerance as part of multiple hypersensitivities (28).

Factors related to eating out that were significantly positively correlated with impairment to quality of life in adults with intolerance included: how often they checked information before choosing where to eat out ($r = .62$), reviewing available information before ordering ($r = .61$), and asking staff for available information ($r = .59$) (all $ps < .001$), as well as being served a dish containing an allergen that participants may have a reaction to in the last 12 months ($r = .18$, $p = .004$).

However, how comfortable participants were in asking for information about food when eating out ($r = -.20$, $p = .002$) and how confident they were in the verbal information ($r = -.18$, $p = .005$) provided when eating out, were significantly correlated with better quality of life.

A regression model was run to see which of the variables described above might predict levels of quality of life. All the variables above which had a significant association with quality of life were included in the model ($n = 10$ predictors). The overall model was significant ($p < 0.001$) and 51% of the variance in quality of life was explained. The strongest predictor was how often participants asked staff for available allergen information when eating out, with those asking more frequently reporting more impairment to quality of life (standardised beta = 0.29). Other variables related to eating out including frequency of checking information when choosing where to eat out (standardised beta = 0.20) and checking information before ordering (standardised beta = 0.18) significantly predicted impairment to quality of life, with those reporting greater frequency of checking information also reporting more impairment to quality of life. A higher severity rating also significantly predicted more impairment to quality of life (standardised beta 0.18). However, adult participants who were more comfortable in asking for information reported significantly less impairment to quality of life (standardised beta = -0.19). None of the other predictors were significant (standardised betas ranged from .02 to -0.08 and confidence intervals for each predictor crossed zero).

Quality of life in adults reporting coeliac disease

For the CDQoL scale, subscales comprise of:

- limitations, relating to social and dietary limitations of having coeliac disease
- dysphoria, related to negative feelings of having coeliac disease

- health Concerns, concerns about the wider impact having coeliac disease will have on health
- inadequate treatment, feelings that there are not enough treatment options for the disease

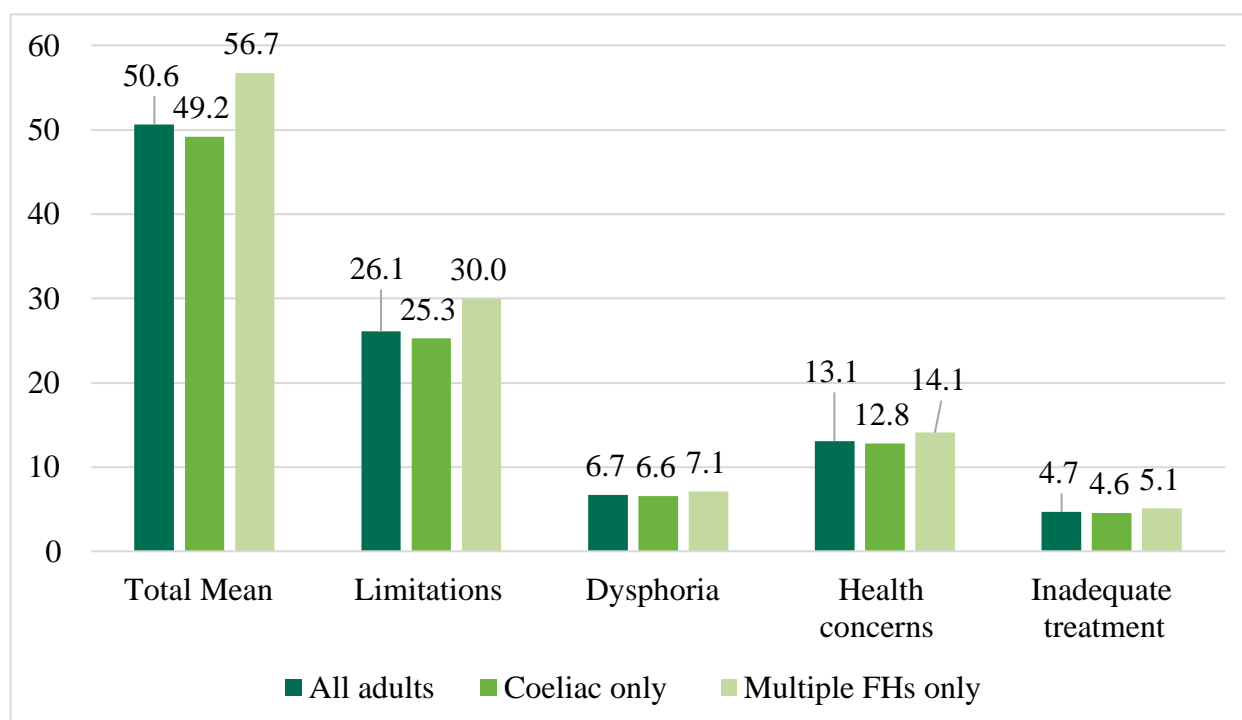
A total of 209 adults reporting coeliac disease completed the CDQoL, with total scores from 20 (least impact) to 100 (maximal impact).

For adults completing the CDQoL, total scores reflected 'moderate' impairment on quality of life (mean = 49.2 out of 100, SD = 18.0). Scores on the subscales were a lot more varied as these subscales had a different range by which they were scored, (for example, Limitations subscale was scored 9 – 45; Dysphoria was scored 4 – 20). However, adults scored around the mean for each of these scales (means = 25.3 for Limitations subscale, scored from 9 (least impairment) – 45 (most impairment); 6.6 for Dysphoria scale scored from 4 (least) -20 (most), 12.8 for Health concerns scored 5 (least) – 25 (most) and 4.6 for Inadequate treatment scale scored from 2 (least impairment) -10 (most impairment)), meaning impairment was 'moderate' for those with coeliac disease for all aspects of quality of life.

For those reporting multiple hypersensitivities, 47 completed the CDQoL. Again, these individuals scored within the mean range (40-60), however scores were slightly higher compared to those with just coeliac disease, indicating a slightly higher impact on quality of life for adults with coeliac disease as part of multiple hypersensitivities. See Figure 20 for means.

Significant factors related to impairment to quality of life in adults reporting coeliac disease included the reported severity of participant's reaction which was significantly associated with impairment to quality of life ($r = .20$; $p = .002$), as well as the number of foods reported ($r = .22$, $p = .001$). Additionally, how often participants had reacted to their first stated food in the last 12 months was significantly positively correlated with impairment to quality of life ($r = .23$, $p < .001$).

Figure 20: Mean CDQoL scores for all adults, adults with coeliac disease only and adults with multiple hypersensitivities



Base: Adults responding to CDQoL (256); Coeliac disease only group (207); Those with food intolerance as part of multiple hypersensitivities (47).

Other factors related to eating out were also significantly correlated with quality of life in adults with coeliac disease. How often participants checked information before choosing where to eat out ($r = .18$, $p = .007$), as well as being served a dish containing an allergen that participants may have a reaction to in the last 12 months ($r = .36$, $p < .001$) were both significantly correlated with impairment of quality of life. However, how comfortable participants were in asking for information ($r = -.36$), how confident they were in the written information ($r = -.39$, $p = .02$) and verbal information ($r = -.39$, all $ps < .001$) provided were all significantly correlated with better quality of life.

A regression model was run to see which of the variables described above might predict level of quality of life. All the variables above ($n=8$ predictors) which had a significant association with quality of life were included in the model. The overall model was significant ($p < 0.001$) and 42% of the variance in quality of life was explained. How comfortable adult respondents were in asking for available information when eating out was the strongest predictor of impairment to quality of life, with those who felt more comfortable reporting less impairment (standardised beta = $-.25$). Greater confidence in written information also significantly predicted less impairment to quality of life (standardised beta = -0.18). However, higher frequency of checking available information before choosing where to eat out (standardised beta = 0.17), as well as higher frequency of being offered a dish containing an allergen in the last 12 months (standardised beta = 0.21) both significantly predicted greater impairment to quality of life. Reporting a greater number of foods which could cause an adverse reaction also significantly predicted poorer QoL for coeliac respondents (standardised beta 0.19). None of the other predictors were significant (standardised betas ranged from -0.08 to 0.11 and confidence intervals for each predictor crossed zero).

Differences in Quality of Life by hypersensitivity

Where possible, comparisons in quality of life scores were made for clinical vs self-diagnosed adults, gender of those reporting hypersensitivities, number of foods reported and severity of reaction. Comparisons for different ethnic groups could not be made as there were not enough adults from each ethnic group to make meaningful comparisons. Furthermore, for some groups, caution should be taken with interpreting some results, as some groups were extremely small. Where more than two groups are compared, a Bonferroni correction has been applied to the significance level of 0.05 ($/3$ in all cases), thus a new level of $.016$ was used for more than two comparisons.

Food allergy only

Of the food allergy only group, 296 adults completed the FAQLQ. Subsample sizes were not equal for comparisons to be made by gender (males 63, females 201).

Clinical diagnosis

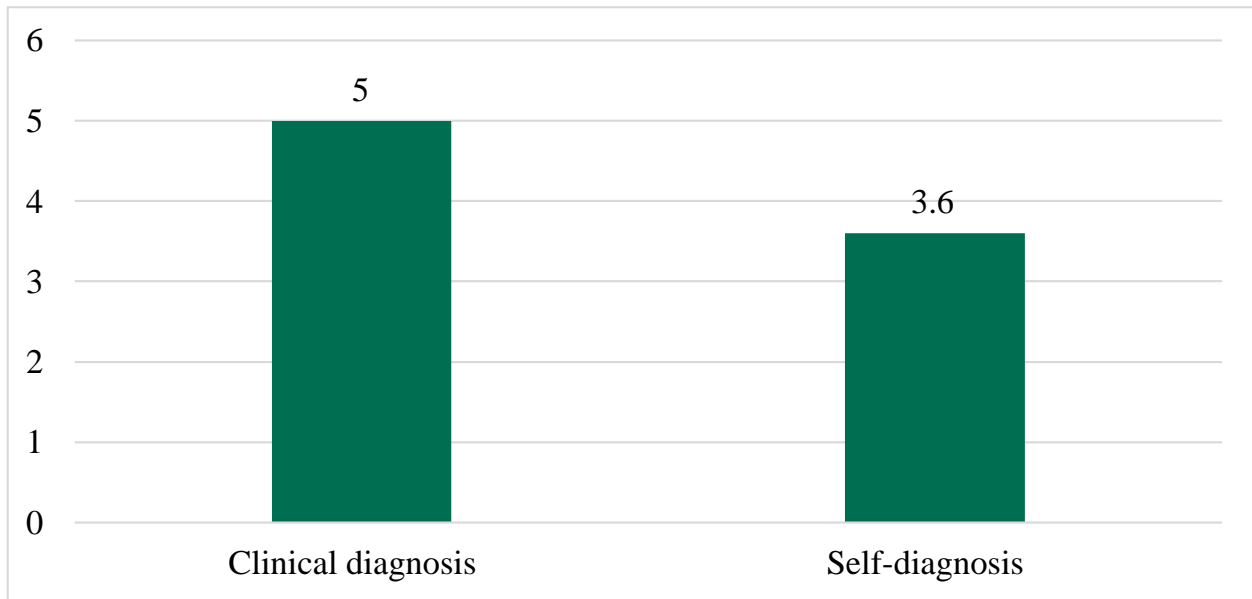
There was a significant difference in impairment to quality of life in those reporting a clinical diagnosis ($n = 187$) and those reporting a self-diagnosis ($n = 65$), $t(97.4) = 6.04$, $p < .001$. Those with a clinical diagnosis (mean = 5.0 , $SD = 1.4$) reported more impairment to quality of life than those with a self-diagnosis (mean = 3.6 , $SD = 1.7$; Figure 21).

Number of foods

To be able to assess meaningful differences by number of foods reported by participants, respondents were recoded into those who reported just one food ($n = 178$) and those reporting two or three foods ($n = 88$). There was a significant difference between those reporting adverse reactions to only one food, and those reporting reactions to more than one food, $F(1) = 43.1$, p

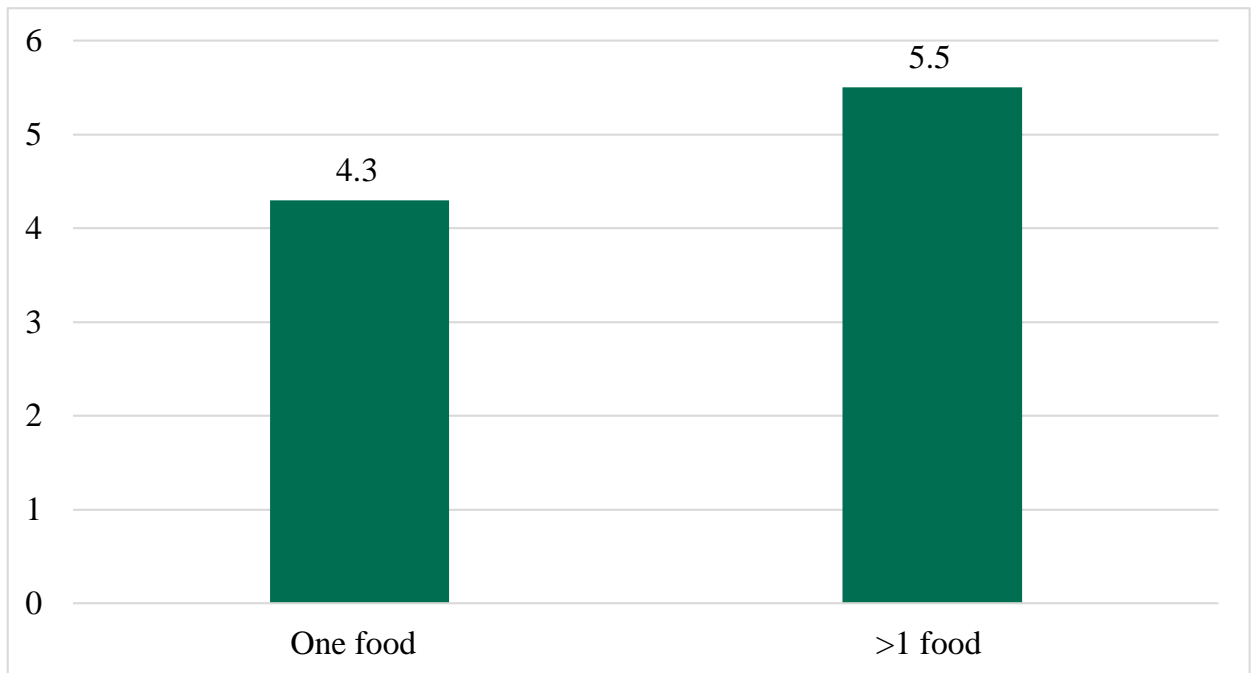
<.001, $\eta^2 = .14$. The means indicated that those reporting more than one food (mean = 5.5, SD 1.1) had higher impairment to their quality of life, than those reporting just one food (mean = 4.3, SD = 1.6; Figure 22).

Figure 21: Mean quality of life scores across diagnosis type



Base: All adults with food allergy reporting diagnosis type (252): Clinical diagnosis (187); Self-diagnosis (65).

Figure 22: Mean quality of life scores across numbers of foods for allergy group

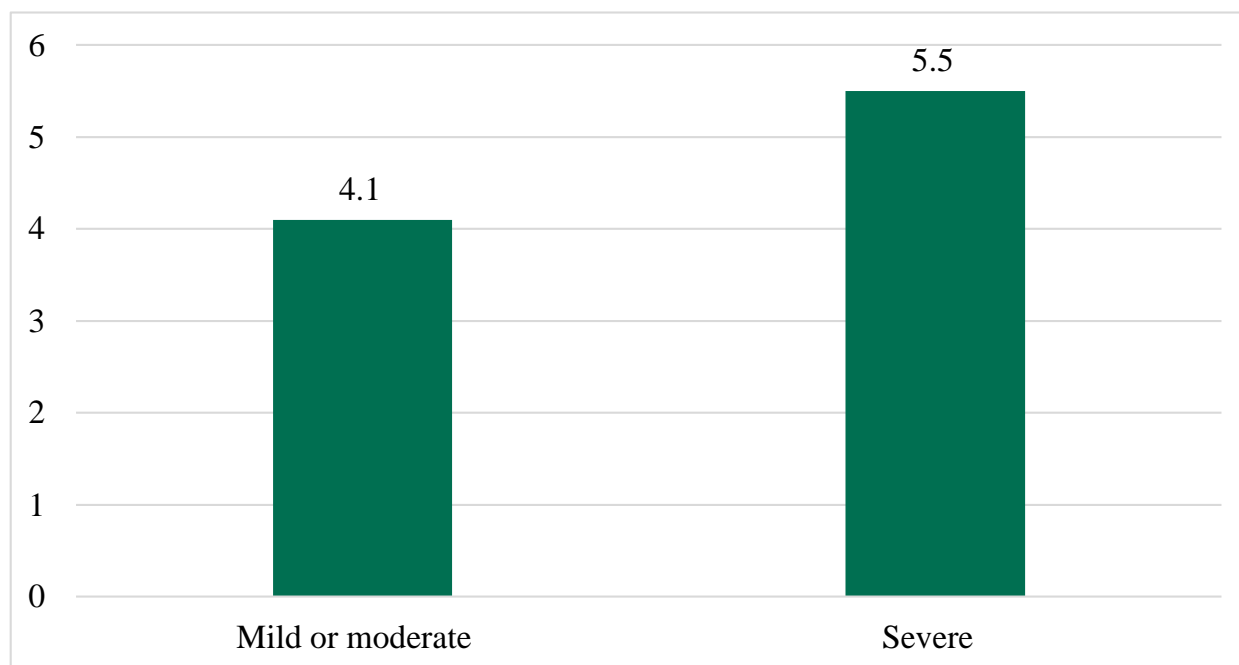


Base: Adults with allergy reporting number of foods (266): One food (178); Two or three foods (88); line with *** indicates significance; *** $p < .001$.

Severity

As the numbers of those experiencing a mild reaction was too small, categories were also recoded for severity, to make meaningful comparison between those with a mild or moderate reaction ($n = 153$) and those with a severe reaction ($n = 113$). There were significant differences in impairment to quality of life by the severity of reaction for those with food allergy, $F(1) = 55.3$, $p < .001$, $\eta^2 = .17$. Those reporting a mild or moderate reaction to their first food (mean = 4.1, SD = 1.6) reported significantly less impairment to quality of life than those reporting a severe reaction, (mean = 5.5, SD = 1.2; Figure 23).

Figure 23: Mean quality of life scores by severity of reaction for allergy group



Base: Adults with allergy reporting severity of reaction (266): Mild or moderate (153); Severe (113); *** $p < .001$.

Food intolerance only

Of the food intolerance only group, 297 adults completed the FIQLQ.

Gender

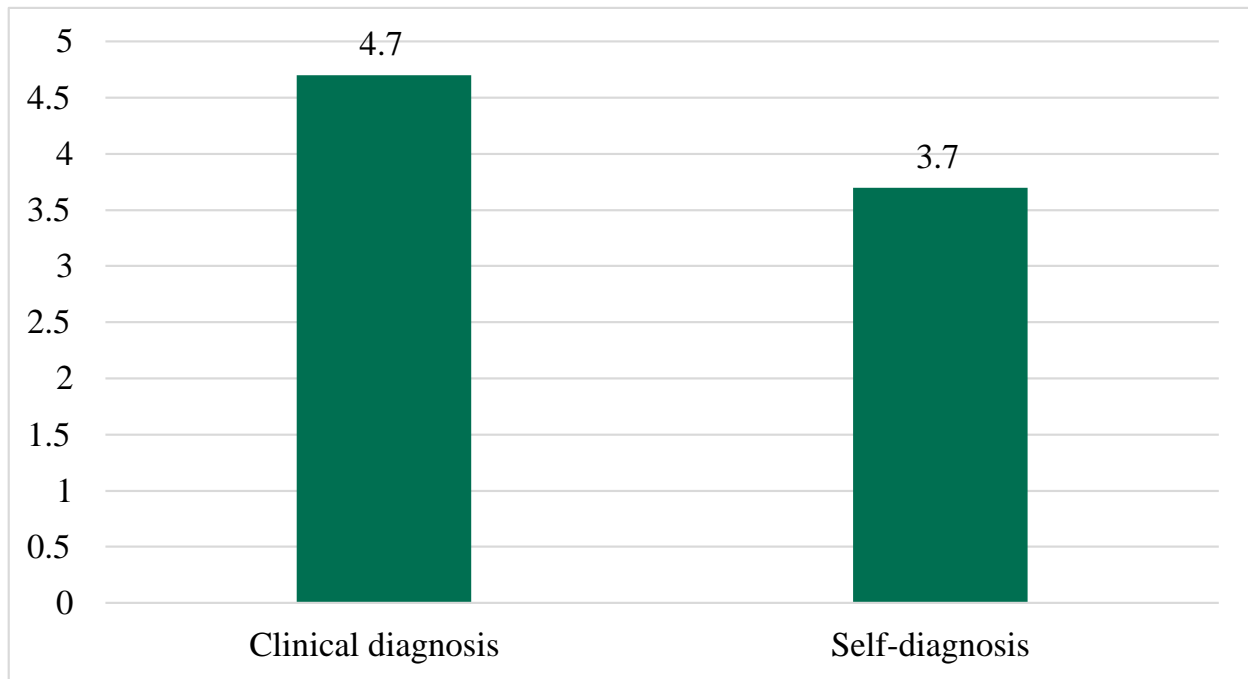
Of those with food intolerance and who completed the FIQLQ, 70 were men, 213 were women. As these groups were not equal sizes, results should be taken with caution.

There were no significant differences between men (mean = 4.1, SD = 1.5) and women (mean = 4.2, SD = 1.7) in impairment to their quality of life from food intolerance, $F(1) = 0.11$, $p = 7.4$, $\eta^2 = .00$.

Clinical diagnosis

Of the adults reporting food intolerance, the quality of life of those with a clinical diagnosis (mean = 4.7, SD = 1.5) was significantly more impaired than those who reported self-diagnosis (mean = 3.7, SD = 1.7), $t(246.3) = 4.96$, $p < .001$ (Figure 24).

Figure 24: Mean quality of life scores by diagnosis for food intolerance group



Base: Adults with intolerance reporting diagnosis type (265): Clinically diagnosed (108); Self-diagnosed (157); *** $p < .001$

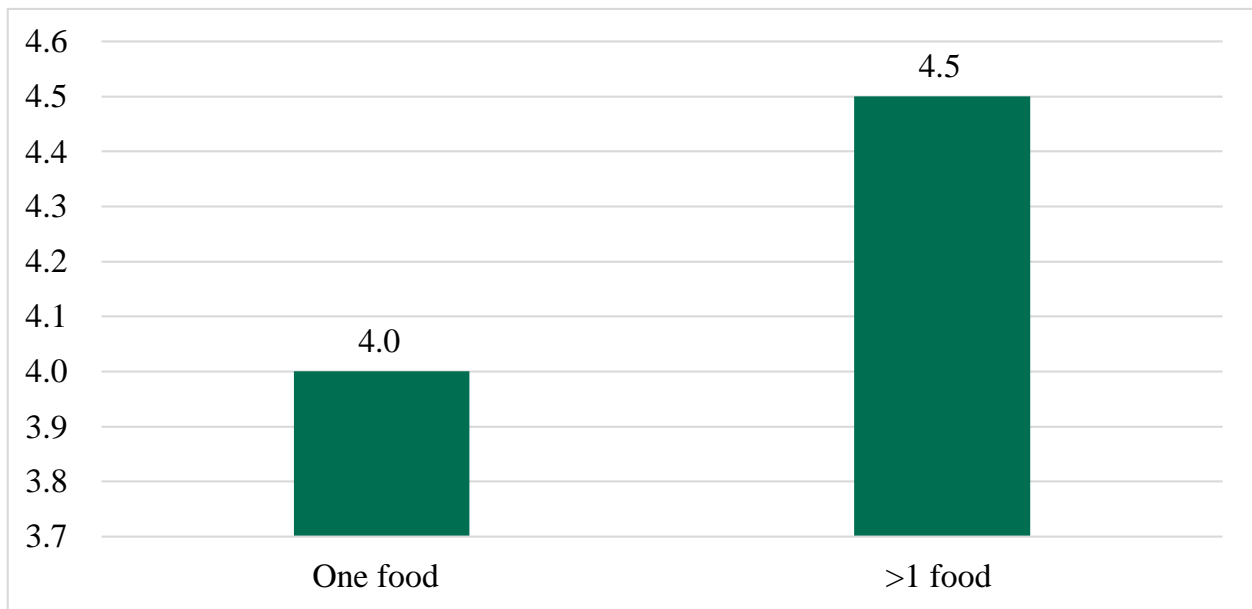
Number of foods

Those reporting one food ($n = 213$, mean = 4.0, SD = 1.7) had significantly less impairment to quality of life compared to those reporting more than one food ($n = 69$, mean = 4.5, SD = 1.4), $F(1) = 4.50$, $p = .04$, $\eta^2 = .02$. However, groups were very unequal and so caution should be taken when interpreting these results (Figure 25).

Severity

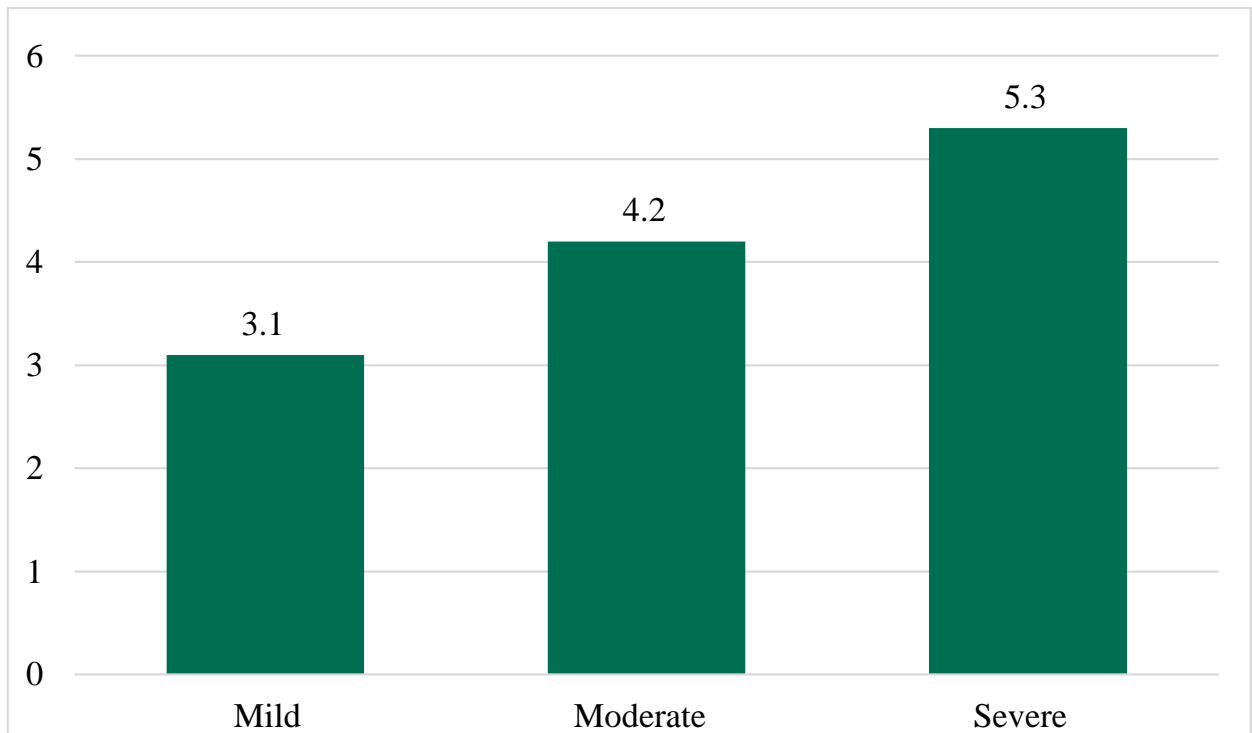
There were significant differences in quality of life according to severity of reaction to the first food amongst food intolerant participants, $F(2) = 28.9$, $p < .001$, $\eta^2 = .17$. Those with self-reported mild reactions had significantly better QoL ($n = 65$; mean = 3.1, SD = 1.5) than those with moderate reactions ($n = 165$; mean = 4.2, SD = 1.6), $t(228) = -4.63$, $p < .001$. Those with mild reactions also had significantly better QoL than those with severe reactions ($n = 53$; mean = 5.3, SD = 1.3), $t(116) = -8.00$, $p < .001$ and those with moderate reactions had significantly better QoL than those with severe reactions, $t(104.1) = -4.91$, $p < .001$ (Figure 26). However, comparisons including moderate severity should be taken with caution as this group was much larger than the other groups and so differences could be inflated.

Figure 25: Mean quality of life scores across number of foods for adults with intolerance



Base: All adults with food intolerance reporting number of foods (283): One food (213); One or more foods (69); * $p < .05$.

Figure 26: Mean quality of life scores by severity of reaction, in food intolerant adults



Base: Adults with food intolerance reporting severity of reaction (283): Mild (65); Moderate (165); Severe (53); *** $p < .001$.

Coeliac disease only

For those in the coeliac group, 207 completed the CDQoL. It was not possible to make comparisons for diagnosis or by number of foods reported as the subsample sizes were too small.

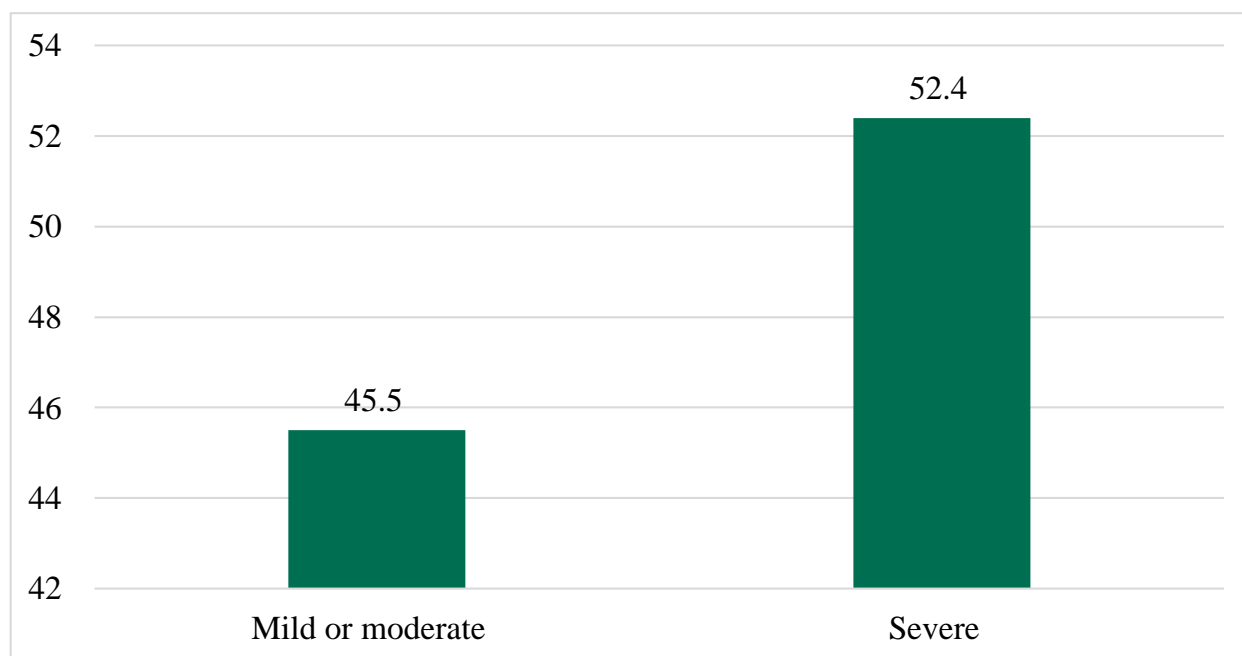
Gender

For gender, the number of men was 38 and the number of women was 159, 1 person classed themselves as 'Other', however as no significant differences would be detected this person was excluded from this analysis (gender only). There was no significant difference in QoL between genders, $t(195) = -1.85$, $p = .07$, with women (mean = 50.2, SD = 18.0) reporting similar impairment to quality of life as men (mean = 44.3, SD = 17.1).

Severity

Numbers were recoded to account for the small numbers of those experiencing a mild reaction and so comparisons were made for those experiencing a mild or moderate reaction ($n = 91$) and those experiencing a severe reaction ($n = 105$). There were significant differences in impairment on quality of life according to severity, $t(192.9) = -2.76$, $p = .006$. Those reporting severe reactions (mean = 52.4, SD = 19.4) had significantly more impaired quality of life than those with a mild or moderate reaction (mean = 45.5, SD = 15.5; Figure 27).

Figure 27: Mean quality of life scores by severity of reactions for adults with coeliac disease



Base: Adults with coeliac disease reporting severity of reaction (196): Mild or moderate (91); Severe (105); ** $p < .01$.

Multiple hypersensitivities

For those with multiple hypersensitivities, 49 completed the FAQLQ, 28 completed the FIQLQ and 47 completed the CDQoL. Comparisons for those with multiple hypersensitivities could not be made as sample sizes were too small to allow for accurate comparisons.

Generic quality of life

All adults completed the EQ-5D-5L which measures generic quality of life. On the visual analogue scale (0-100 with 0= death and 100= full health) those with coeliac disease reported a higher mean score ($n = 209$, mean = 77.4, SD = 17.7) than those with food allergy ($n = 301$, mean = 70.5,

SD = 21.8), food intolerance (n= 296, mean = 69.0, SD = 19.8), or multiple hypersensitivities (n = 123, mean = 68.6, SD = 21.8) who all reported scores which were noticeably lower. This pattern across FHs was similar for the EQ-5D overall mean score (mean coeliac = 0.82; allergy = 0.80; intolerance = 0.74).

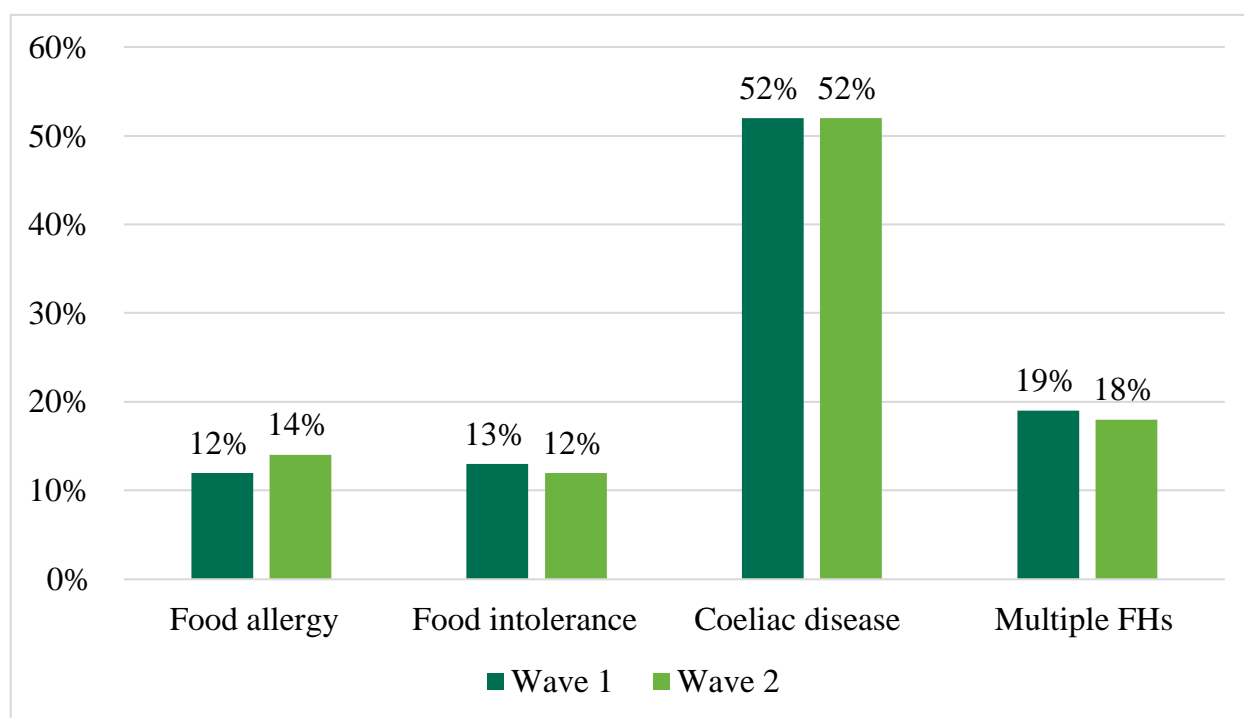
Distributions of scores on the EQ-5D-5L sub-domains were examined against known values for the UK population. Pearson's chi-squared tests indicate that the distributions of scores were different at the 1% level for Mobility ($\chi^2 = 16.64$, Pr = 0.002), Selfcare ($\chi^2 = 40.39$, Pr = 0.000), Usual Activities ($\chi^2 = 48.41$, Pr = 0.000), Pain ($\chi^2 = 71.40$, Pr = 0.000) and Anxiety ($\chi^2 = 219.02$, Pr = 0.000). Inspection of the data suggest that the adults with FH report significantly lower proportions of those reporting the 'best' quality of life and a significantly higher proportion of those reporting moderate impact to quality of life on every dimension, compared to the UK population.

Comparisons between Wave 1 and Wave 2

Where appropriate analyses was also carried out to compare those participants who took part in wave 1 (in 2020) and this wave 2 survey, to see if their eating out behaviours and quality of life had changed over the course of a year. A total of 313 adults completed both time points (see Table 27 for details of each sample).

Across both waves, the majority of adults reported having coeliac disease (52%) and then multiple hypersensitivities, food allergy and food intolerance (see Figure 28). At Wave 1, 3% (n = 10) and at Wave 2, 4% (n = 13) also reported 'Other' reactions but these are not reported in the subsequent sub-analysis. It is important to note that at Wave 1 a large proportion of adults reported coeliac disease reactions (n = 409, 44%) which may explain why the proportion of those with coeliac taking part at both time points is skewed (higher).

Figure 28: Percentage of adults completing Wave 1 and Wave 2 in each hypersensitivity group



Base: All adults completing both Waves with hypersensitivities: Food allergy (Wave 1: 38; Wave 2: 44); Food intolerance (Wave 1: 40; Wave 2: 38); Coeliac disease (Wave 1: 164; Wave 2: 162);

Multiple hypersensitivities (Wave 1: 61; Wave 2: 56)

Eating out

Data was compared to see if there was any differences in how frequently participants ate out and checked available information when eating out.

There was no significant differences in how frequently participants at wave 1 (mean = 3.0, SD = 1.3) ate out, compared to at wave 2 (mean = 3.0, SD = 1.3) with participants reporting that on average they eat out around once a month at each time point, $t(294) = 1.23$, $p = .22$.

Additionally, there was no significant differences for how frequently adults checked available information when choosing where to eat out between wave 1 (mean = 4.5, SD = 1.1) and wave 2 (mean = 4.5, SD = 1.0) and before ordering between wave 1 (mean = 4.7, SD = 0.8) and wave 2 (mean = 4.7, SD = 0.8; both $ps >.05$), on average checking this most of the time or always. For frequency of asking staff for available information when eating out, there was no significant differences between wave 1 (mean = 4.4, SD = 1.1) and wave 2 (mean = 4.4, SD = 1.1, $p = .77$) with participants reporting that they check this most of the time or always.

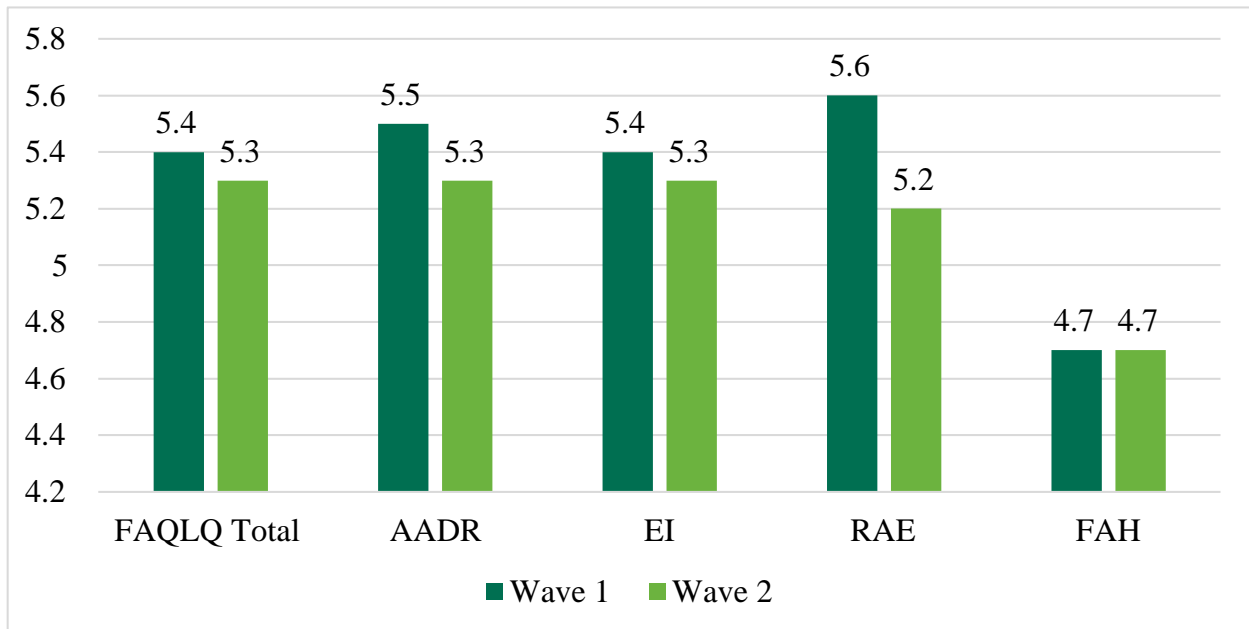
There were also no significant differences how comfortable adults were in asking for information when eating out at wave 1 (mean = 3.1, SD = 0.9) and wave 2 (mean = 3.1, SD = 0.9). There were also no significant differences in how confident adults were in verbal written, reporting they were not very or fairly confident at wave 1 (mean = 2.6, SD = 0.8) and wave 2 (mean = 2.6, SD = 0.8). However, adults at wave 1 reported being significantly more confident in written information (mean = 2.9, SD = 0.7) than at wave 2 (mean = 2.7, SD = 0.7), $t(202) = 2.83$, $p = .01$.

Quality of life

Comparisons for each of the food hypersensitive specific quality of life measures (FAQLQ, FIQLQ and CDQoL) were made, to compare participants quality of life in wave 1 with reported quality of life in wave 2. Participants who completed measures at each wave for their first food reported were included in the analysis.

Adults completing the FAQLQ ($n = 35$) at wave 1 (mean = 5.4, SD = 1.3) did not report significantly different impairment to quality of life than at wave 2 (mean = 5.3, SD = 1.4). There were also no significant differences reported across the subscales (see Figure 28 for means; all $ps >.05$). Adults with allergy reported higher than the mean impairment to quality of life (4 out of 7 indicating moderate impairment), often reporting instead that impairment to quality of life was 'quite a bit' (over 5 out of 7; Figure 29).

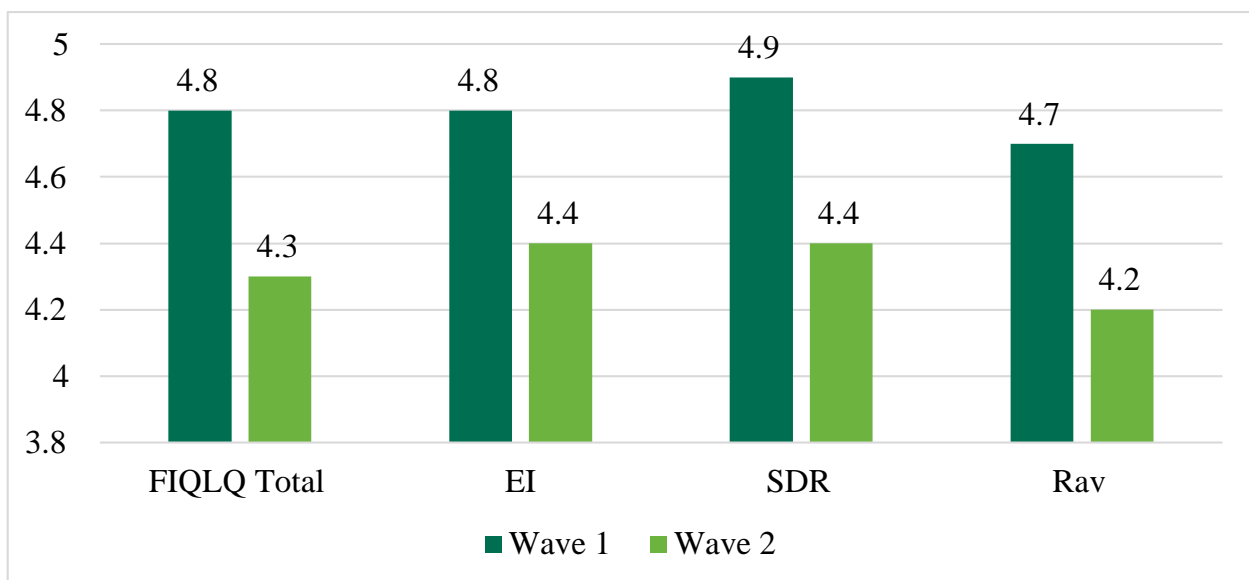
Figure 29: Mean quality of life scores for adults with allergy completing wave 1 and wave 2



Base: Adults completing the FAQLQ at wave 1 and wave 2 (35).

There were however significant differences for adults completing the FIQLQ (n = 31). Adults at wave 1 (mean = 4.8, SD = 1.2) reported significantly more impact on their total quality of life than those at wave 2 (mean = 4.3, SD = 1.9), $t(29) = 3.87$, $p = .001$, indicating moderate to 'quite a bit' of impairment. There were also significant differences across subscales (see Figure 30 for means; all $p < .01$), with participants reporting significantly more impairment to quality of life at wave 1 because of the worries and concerns of having food intolerance, the dietary and social limitations and having to check foods to avoid a reaction, indicating 'quite a bit' of impairment.

Figure 30: Mean quality of life scores for adults with intolerance completing wave 1 and wave 2



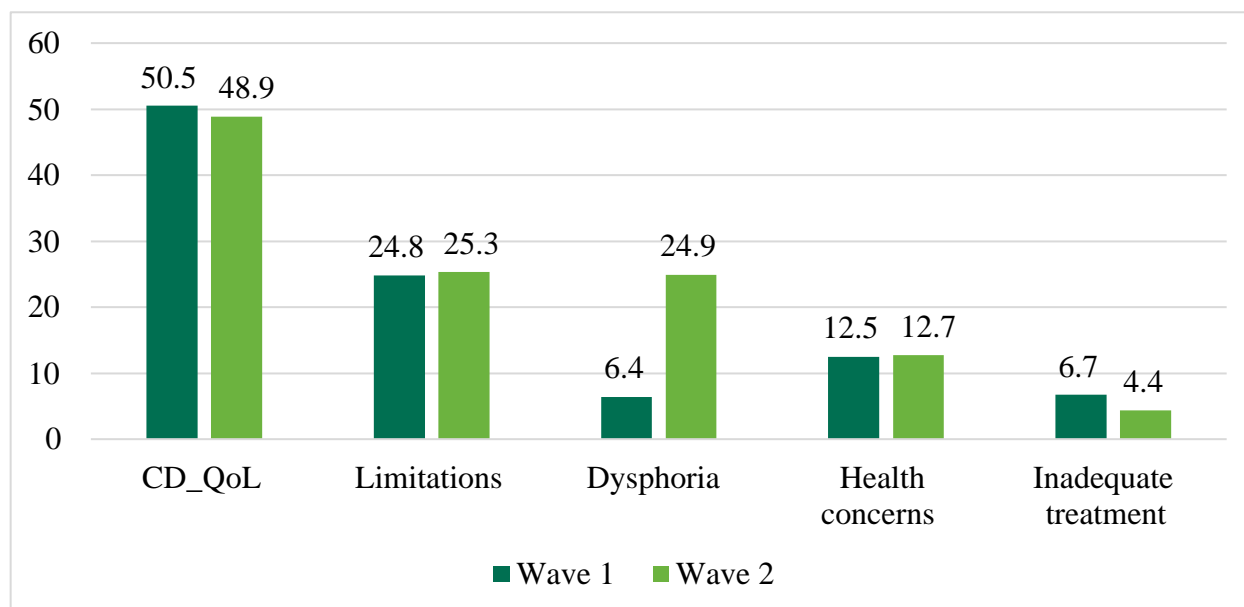
Base: Adults completing the FIQLQ and wave 1 and wave 2 (31).

For those with coeliac disease (n = 182), there were also significant differences across waves for those completing the CDQoL. Those at wave 1 (mean = 50.5, SD = 16.7) reported significantly more impairment to quality of life than at wave 2 (mean = 48.9, SD = 17.7), indicating moderate impairment (mean impairment = 50), $t(159) = 2.24$, $p = .03$. There were also significant

differences on the dysphoria, $t(173) = -30.5, p < .001$ and inadequate treatment $t(181) = 11.5, p < .001$ subscales between the waves (see Figure 31 for means).

While there was an improvement to hypersensitivity specific quality of life at wave 2 for those with food intolerance and coeliac disease across the two waves, for comparisons between wave 1 and wave 2 for general quality of life (EQ5D), there was an overall decline in VAS scores, between wave 1 (mean = 73.8, SD = 19.1) and wave 2 (mean = 71.0, SD = 20.8). Further, across the different sub-domains, participants from the wave 2 sample reported poorer overall quality of life, with higher proportions reporting moderate impact to quality of life (for example, I have 'slight' or 'moderate' problems...), compared to those in the wave 1 sample. The largest differences were observed for the mobility (for example, 11% at wave 2 vs 6% at wave 1 reporting that they have moderate problems walking around), self-care (6% at wave vs 3% at wave 1 with moderate problems looking after themselves) and usual activities subdomains (12% at wave 2 vs 8% at wave 1 with moderate problems doing their usual activities).

Figure 31: Mean quality of life scores for adults with coeliac disease completing wave 1 and wave 2



Base: Adults completing the CDQoL at wave 1 and wave 2 (182).

1. 'Other' support groups included groups on social media (such as Facebook support groups; Mast Cell Action groups; Mastocytosis UK; IBS Network, Asthma UK; Crohn's and Colitis UK and other doctor-patient support groups).
2. Significance testing was completed only for first foods reported as sample sizes were too small to enable comparisons for second and third foods.
3. Significance testing was completed only for first foods reported as sample sizes were too small to enable comparisons for second and third foods.
4. Anaphylaxis was defined to respondents as 'You might have had an anaphylactic reaction if you had breathing difficulties and/or a drop in blood pressure quite suddenly after eating

food. You may also have had a rash or stomach symptoms such as vomiting at the same time'

5. More information on the scales can be found in the methods

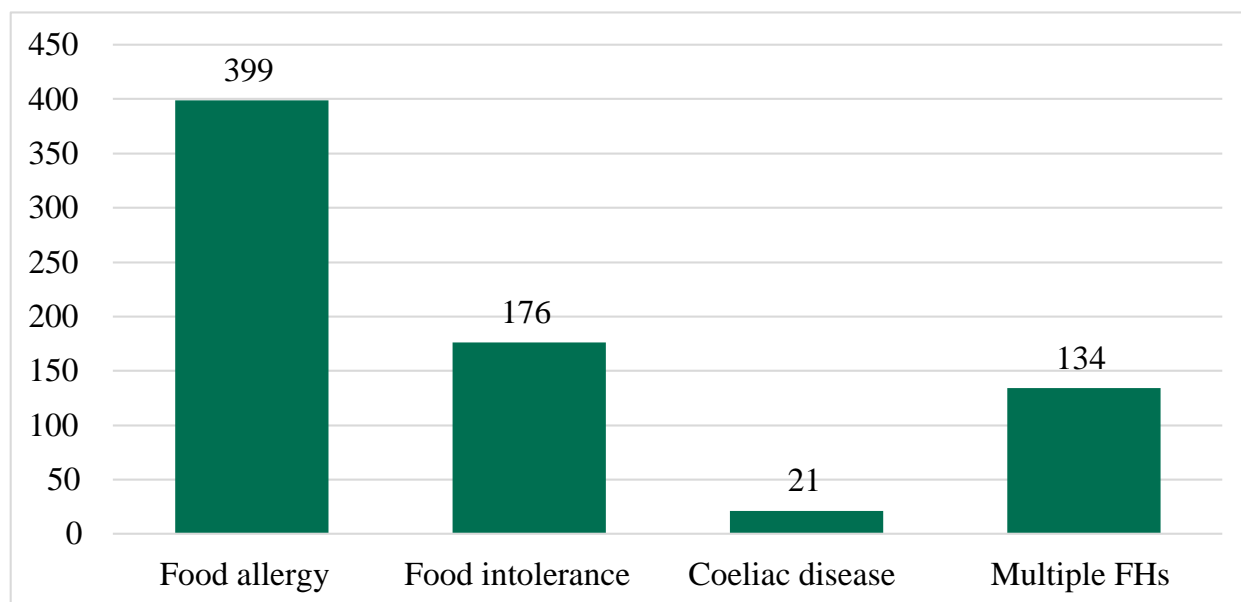
Part 2: Parents of children with food hypersensitivity

A total of 750 parents of children (under 18 years) with FH completed the survey, which included n= 20 reporting 'Other' or 'Don't know' when asked to describe these reactions to food. These participants are not reported on in analysis as a subgroup but are included in the 'all parents' figures. From this total of 750 parents, 77 had also taken part in wave 1. For further detail please see pages 86-88 and Annex B, Table 47.

Prevalence of food hypersensitivities

The majority of parents reported children who had food allergy only (n = 399; 53%) followed by food intolerance only (n = 176; 23%). Fewer parents reported children with coeliac disease only (n = 21; 3%) or multiple hypersensitivities (for example, parents of one child with multiple food hypersensitivities or multiple children with different food hypersensitivities; n = 134; 18%) (Figure 32).

Figure 32: Prevalence of parents with children with each food hypersensitivity within the sample



Base: All parents reporting children with a hypersensitivity, excluding 'other' and 'don't know' (730).

Profile of parent participants

Parents' key characteristics

From a total of 750 parent participants, 78% (n = 580) of those reporting a child with a food hypersensitivity were female (22%; n = 167 were male; 1 reported 'In another way'; 0.1%). The mean age of all parent participants was 37.1 years old (SD = 7.9), with a range from 18 to 62 years old. The majority of parents were of White British ethnicity (n = 607; 81%. See Annex B Table 28).

Parents of children with food allergy (mean age: 38.4 years old; SD = 7.6) were significantly older than those reporting children with a food intolerance (mean age: 34.6 years old; SD = 7.9) and multiple food hypersensitivities (mean age: 35.8; SD = 7.6; all ps <.008). There was no significant differences in age for parents of children coeliac disease (mean age: 40.6; SD = 8.1).

As with the whole sample, across all hypersensitivities, the majority of parents were of White British ethnicity (see Annex B Table 28 for a full breakdown). The most common region for all parents living with a child with a food hypersensitivity was London (n = 126, 17%). This was also true across the hypersensitivities, except for parents in the food intolerance group, who most commonly lived in the South East of England (n = 31; 18%; see Annex B Table 29 for a full breakdown).

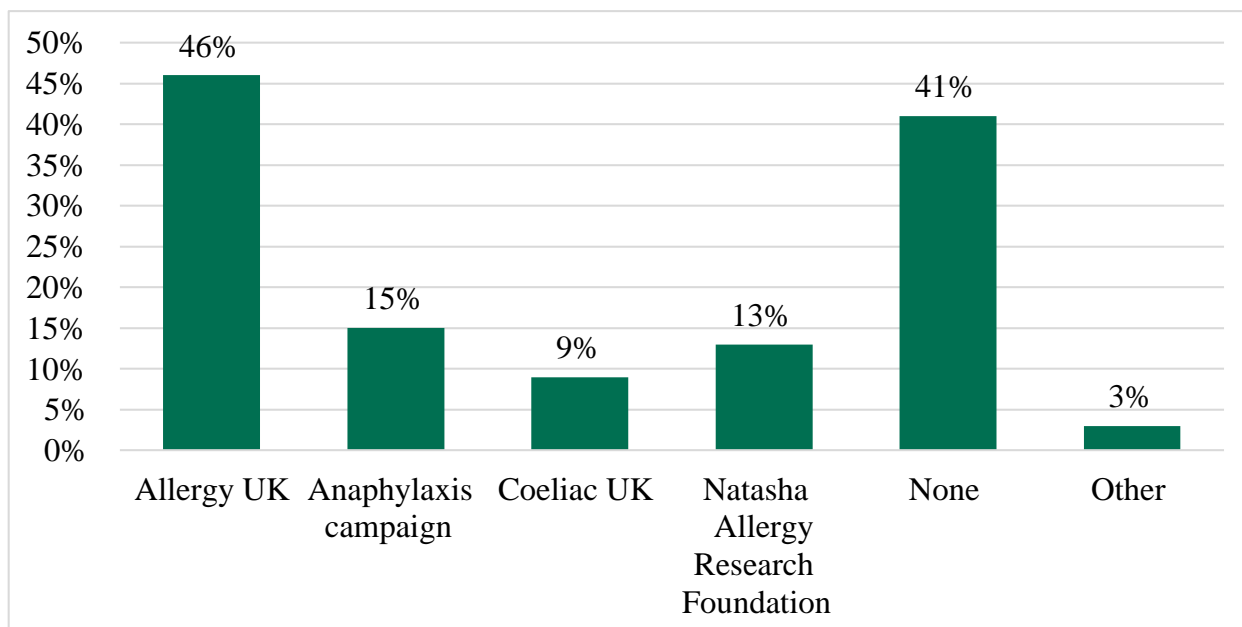
Fifty two percent (n = 388) of the sample were in full-time employment, 27% (n = 198) were in part-time employment but 17% (n = 124) were not working (for a full breakdown see Annex B Table 30). Across the hypersensitivities, children with multiple hypersensitivities had the highest percentage of parents in full-time employment (64%, n = 86), whilst children with coeliac disease had the highest percentage of parent respondents who were not working (24%; n = 5).

Parent participants were asked how many children between 0-17 years they had in their household, as well as how many with food hypersensitivities. Parents most commonly reported having two children in total living at home (n = 350; 48%) aged 0-17 years, and most commonly reported only one child (n = 567; 77%) living at home with a food hypersensitivity.

Patient organisation membership

Parents were asked to report on whether they were a member of any patient organisations because of their children's reactions to food. Whilst 41% (n = 306) were not members of any patient organisations, the most commonly reported organisation that parents belonged to was Allergy UK (46%; n = 334), followed by The Anaphylaxis Campaign (n = 115; 15%; see Figure 33). Of those reporting 'Other', this included support groups on social media, such as Facebook support groups (for example, gluten free/nut free/ allergy support groups); Facebook pages and websites of other patient organisations (for example, Cow's Milk Protein Allergy support pages/groups; Mast Cell support groups).

Figure 33: Membership of patient organisation groups

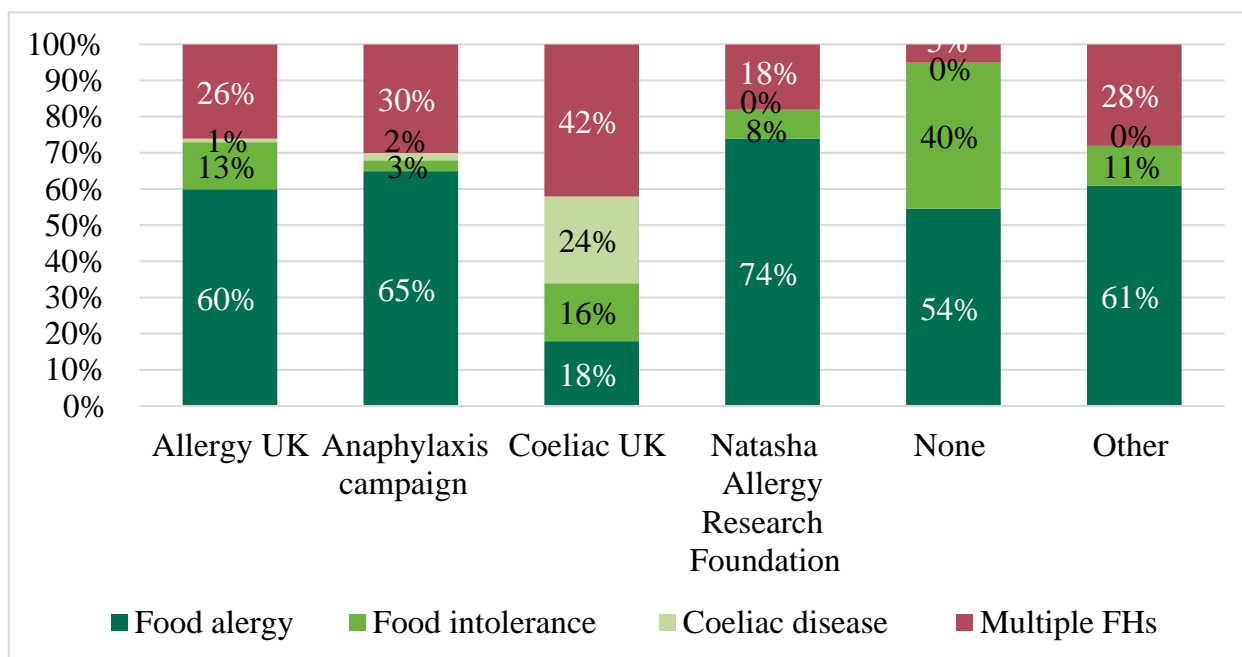


Base: All parents (750).

Membership of a patient organisation differed according to hypersensitivity. For parents of children with food allergy the most subscribed to organisation was Allergy UK (n = 197; 49%); for parents of children with coeliac disease, the most subscribed to was Coeliac UK (n = 16; 76%); and for parents of children with multiple hypersensitivities the most subscribed to was Allergy UK (n = 86; 64%; Figure 34).

A majority of parents of children with food intolerance did not subscribe to any organisations (n = 120; 68%). A large proportion of parents of children with food allergy also reported not being a member of a support group or patient organisation (n = 162; 41%) in contrast to parents of children with coeliac disease (n = 0; 0%) and multiple hypersensitivities (n = 16; 12%; Figure 34).

Figure 34: Membership of patient organisations by hypersensitivity



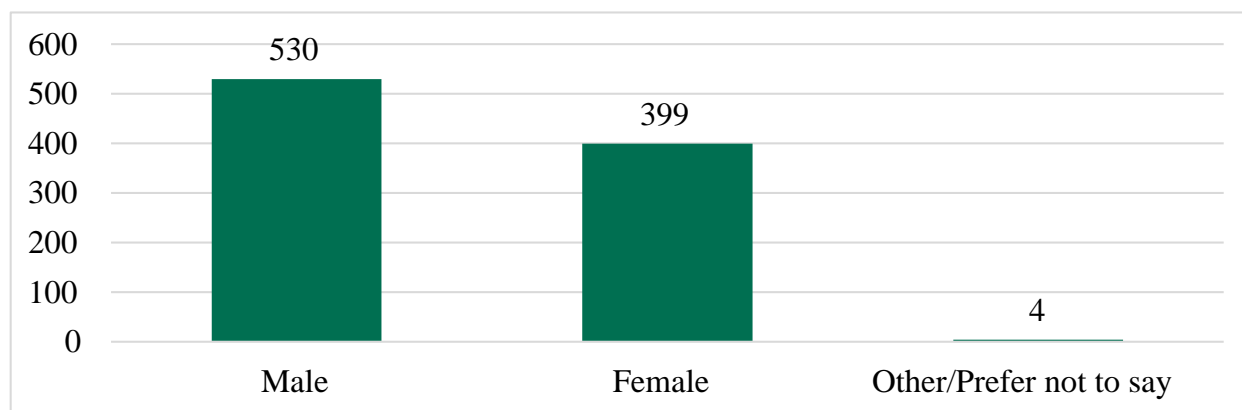
Base: All parents reporting children with a hypersensitivity (730): Food allergy (399); Food intolerance (176); Coeliac disease (21); Multiple FHs (134)

Child's key characteristics

Parents could report in more detail on up to 3 children in their household with food hypersensitivities. Within this section, characteristics across all children reported have been combined unless otherwise stated.

Of all children reported by participants (n = 933), 57% of children with a food hypersensitivity were male and 43% were female (Figure 35).

Figure 35: Gender of all children reported by parent participants



Base: All children reported by parents, for gender (933); Male (530); Female (399); Other/Prefer not to say (4).

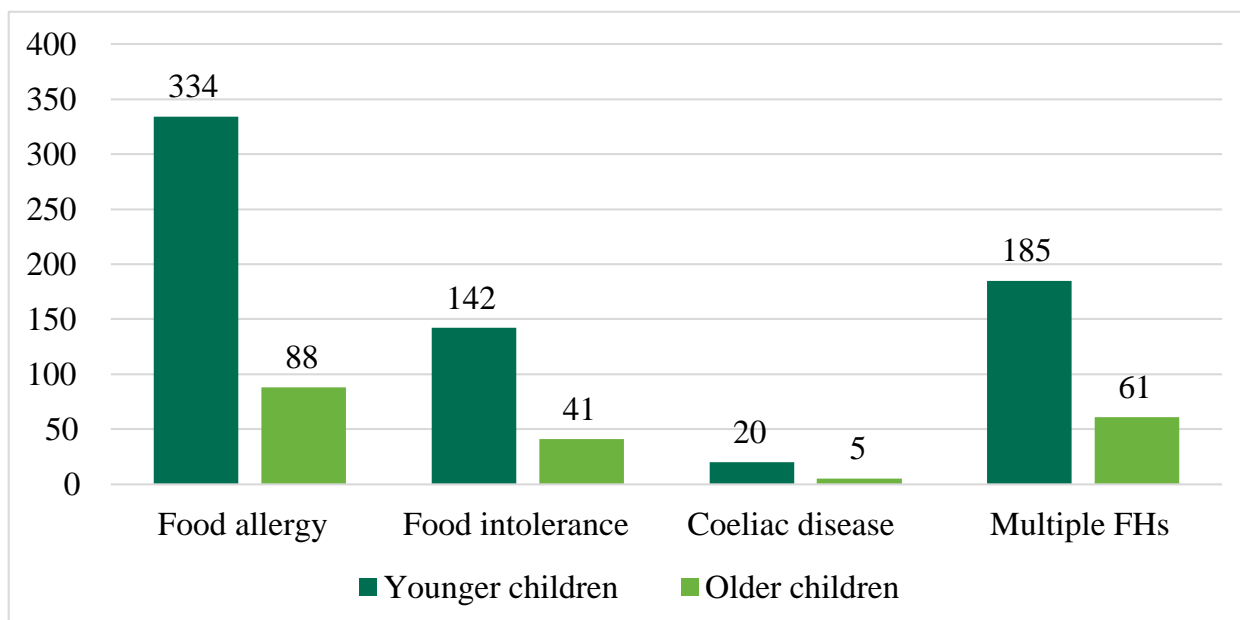
The mean age of all children reported was 7.7 years old (average SD = 4.8). Across all children, parents reported on 699 younger children (0-12 years old) and 198 older children (13-17 years old). The majority of parent participants reported that their children were of White British ethnicity (n = 729; 79%. See Annex B Table 31).

Children with multiple hypersensitivities (mean age across all 3 children: 8.2; SD = 4.8) were typically reported by their parents to be older than those reporting a food intolerance (mean age: 6.3 years old; SD = 5.2), coeliac disease (mean age: 7.3 years old; SD = 4.2) or food allergy (mean age: 7.4; SD = 5.4; Figure 36).

Parents also reported more male children across each of the hypersensitivities than females, although this difference was biggest amongst parents reporting children with multiple hypersensitivities (62% males; see Figure 37).

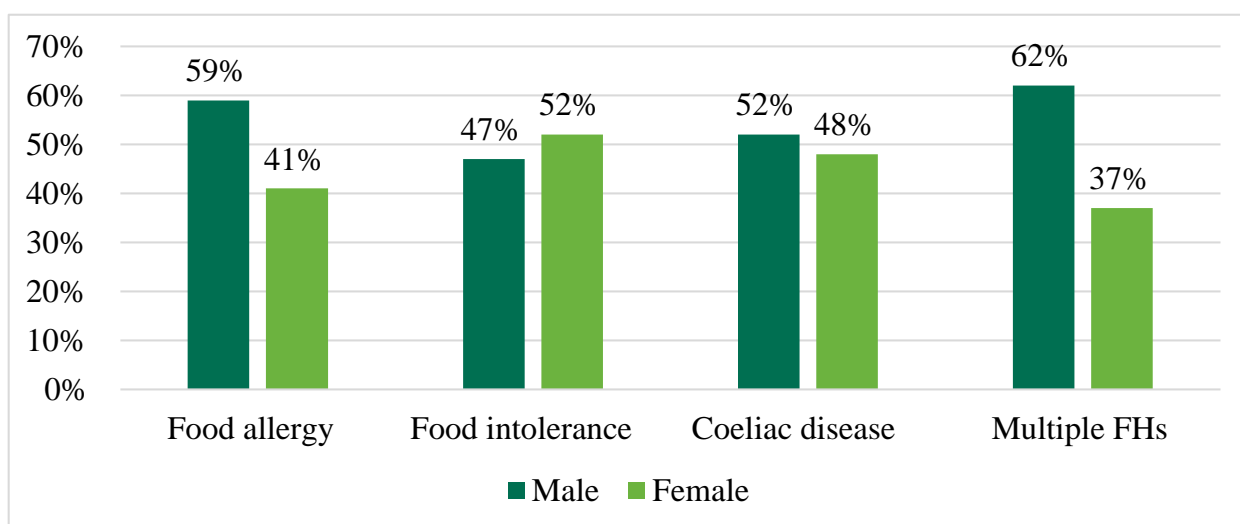
As with the overall sample, for ethnicity, across the hypersensitivities, the majority of children were of White British ethnicity (78%; see Annex Table 31).

Figure 36: Numbers of younger and older children reported by parents, by hypersensitivity



Base: All children reported by parents in the hypersensitive groups (876): Younger children (0-12-year olds; 681); Older children (13-17-year olds; 195)

Figure 37: Gender of children reported by parents, by hypersensitivity

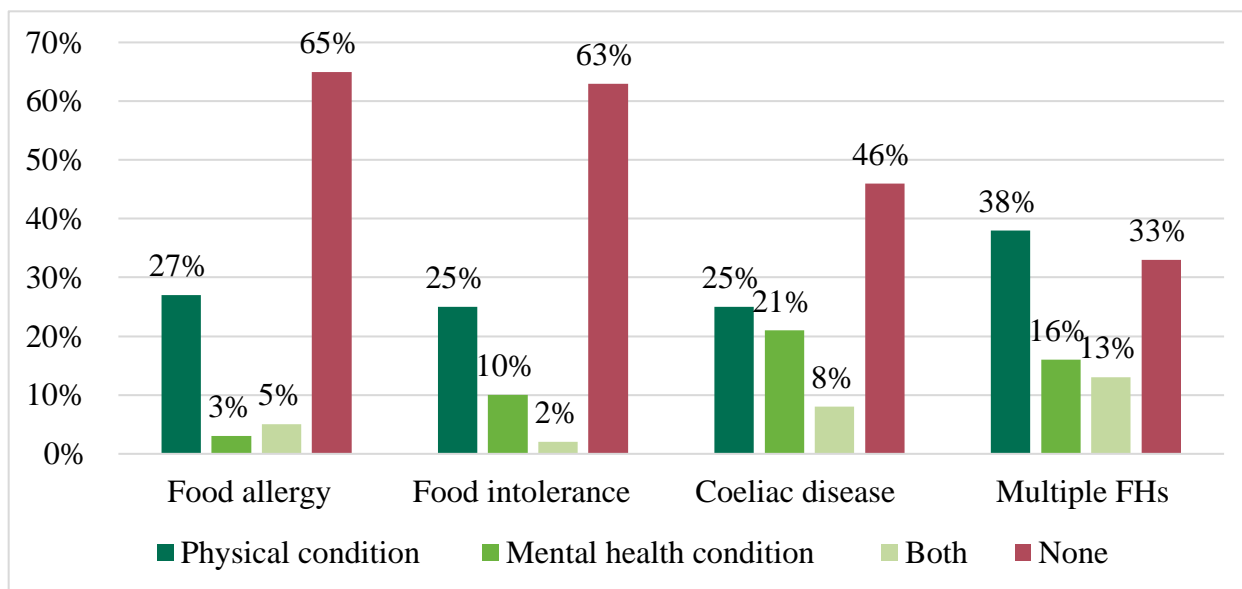


Base: All children reported by parents in the hypersensitive groups (907): Food allergy (429); Food intolerance (184); Coeliac disease (25); Multiple FHs (269).

Other long-term conditions

Parents reported that 30% (n = 267) of children had another physical long-term condition, 8% (n = 76) had a mental health condition and 7% (n = 66) had both a mental health and physical condition. Parents reported that children with multiple hypersensitivities had higher percentages for all these conditions compared to the other hypersensitive groups, apart from parents of children with coeliac disease, who reported higher proportion of mental health conditions (21%; Figure 38).

Figure 38: Other long-term conditions by hypersensitivity



Base: All children with other conditions (880); Food allergy (412); Food intolerance (182); Coeliac disease (24); Multiple FHs (262).

Reactions to food

Parents were asked to report the reactions their children experience for each child separately, up to a maximum of three children in their household. For each child, participants were asked to report all foods they experience adverse reactions to, before reporting in detail on up to three foods per child. Results for all children and foods are combined.

When asked to initially report all foods their children react to, milk (n = 352, 12%), eggs (n = 317, 10%) and peanuts (n = 236, 8%) were the most frequently reported foods, with peanuts most common for those reporting their child's reaction as food allergy (n = 173, 8%), eggs for those with children with food intolerance (n = 106, 29%), cereals for children with coeliac disease (n = 19, 42%), as well as for children with multiple hypersensitivities (n = 88, 11%). Please see Annex B Table 32 for a full breakdown of frequencies of foods reported by hypersensitivity.

Foods with adverse reactions

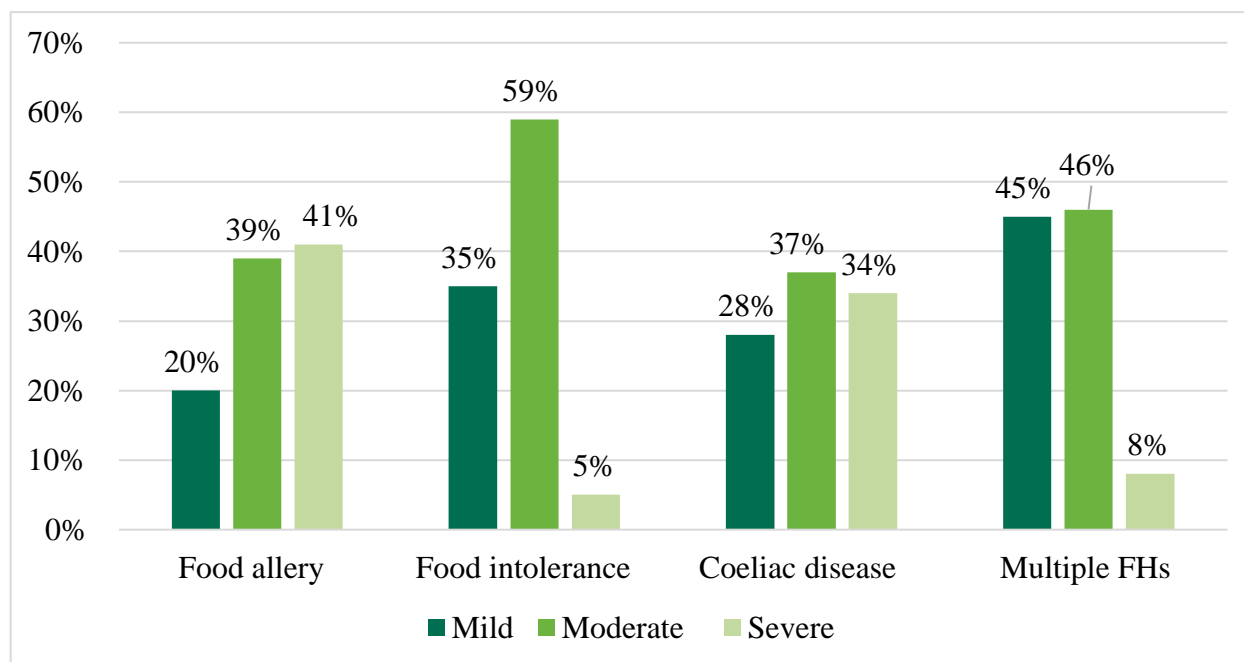
When asked to report on three foods in detail, parents reported a total of 1,523 foods that their children reacted to (please note this is not separate types of food but the number of foods reported in total by parents). Parents reported their child's reaction as food allergy (n = 792; 52%), food intolerance (n = 453; 30%), coeliac disease (n = 209; 14%), other or don't know (n = 69; 5% not focussed on exclusively in this report).

The most common foods to be reported in detail for all children with a hypersensitivity were tree nuts (n = 298; 20%), milk (n = 296; 19%), eggs (n = 215; 14%) and peanuts (n = 142; 9%). The majority of those reporting a reaction to tree nuts (64%; n = 190) was those with multiple hypersensitivities, whereas the majority reporting a reaction to peanuts (78%; n = 111) and egg (50%; n = 107) were those with food allergy. Milk was also commonly reported by parents of children with food allergy (45%; n = 133) and for parents of children with food intolerance (30%; n = 90). Other foods included cheese, bread, onions/garlic, condiments, and tea. For a full breakdown of foods by hypersensitivity please see Annex B Table 33.

Across all three children and all foods, parents rated their child's condition as mild (total number of reactions reported by parents (n = 492), moderate (n = 665) or severe (n = 330). Parents of

children with food allergy were most likely to report their reaction as severe (41%), whereas parents of children with food intolerance (59%), coeliac disease (37%) and multiple hypersensitivities were most likely to report their reaction as moderate (46%; Figure 39).

Figure 39: Severity of reaction to foods, by hypersensitivity



Base: All reactions reported on by parents for children in hypersensitivity groups (1,447): Food allergy (604); Food intolerance (204); Coeliac disease (29); Multiple FHs (610).

Symptoms

Parent participants reported that their children experienced a wide range of symptoms, which were grouped into breathing (for example, coughing/sneezing, wheezing, breathless), skin (for example, rash, itchy, dry skin, swelling of face, eczema), gastrointestinal (for example, abdominal pain, sickness/vomiting/diarrhoea, loss of weight), mouth/throat/ear symptoms (for example, tingling/itching, tight throat, tongue swelling) and other reactions (for example, anaphylaxis, incontinence, collapse or seizure). Parents could choose as many symptoms as they felt applied to their child's reaction, so numbers reflect how many times/occurrences each symptom type was chosen.

The majority of symptoms experienced across all foods were gastrointestinal symptoms (28%; n = 2795), of which 38% (n = 1076) were reactions reported by parents of children with multiple hypersensitivities. For children with food intolerance (48%; n = 506) and coeliac disease (58%; n = 69) the most common symptoms experienced were also gastrointestinal. For parents of children with food allergy, the most common symptom type experienced was breathing symptoms (30%; n = 1401; Annex B Tables 34-36).

The most severe symptoms experienced to all foods were gastrointestinal symptoms (28%; n = 2090), of which 45% (n = 944) were reported by parents of children with multiple hypersensitivities. For parents of children with food intolerance (49%, n = 364) and coeliac disease (53%, n = 41) the most common severe symptoms were gastrointestinal) and for parents of children with food allergy, the most common severe symptoms were skin symptoms (28%, n = 808; Annex B Table 37).

Most parents reported that their child's symptoms started between 5 to 30 minutes (n = 480; 33%) after ingesting the stated food and this was also true for those with food intolerance (n = 95;

48%). However, for those with coeliac disease (n = 12; 45%) and multiple hypersensitivities (n = 317, 51%) symptoms more frequently occurred after 30 minutes and for those with food allergy, symptoms most commonly started within 5 minutes (n = 282, 49%; Annex B Table 38).

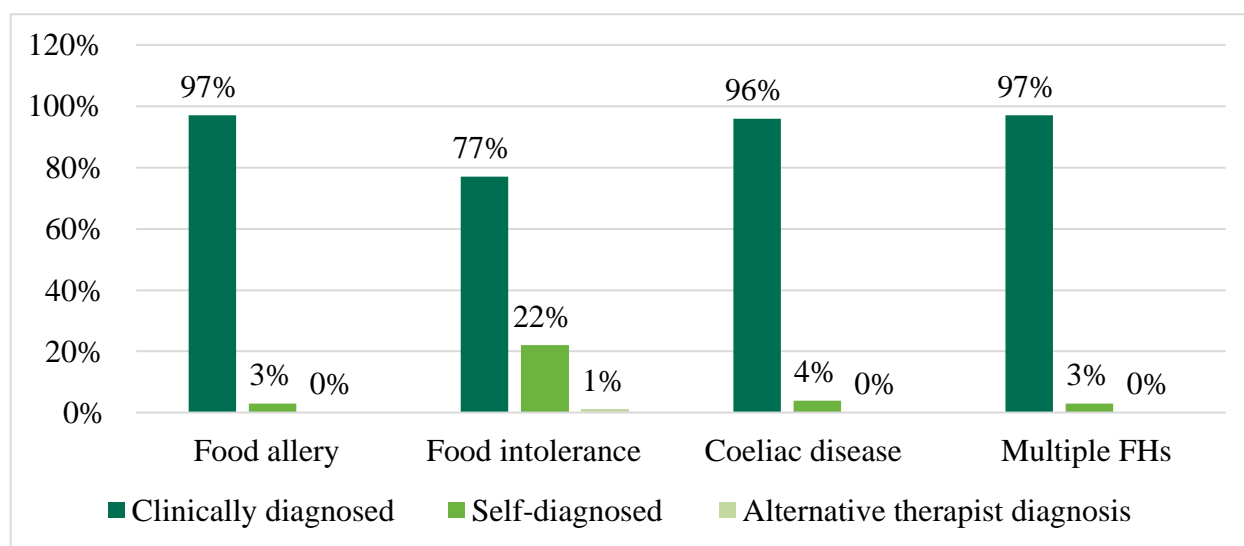
Diagnosis

Parents were asked how their children's reactions had been diagnosed and who by, to determine whether they had been clinically diagnosed or were self-diagnosed. For the whole sample and across all hypersensitivities, the majority reported that their child's reaction to food was clinically diagnosed (total n = 1,334; 94% of all foods reported, Figure 40).

Most parents reported that their children were diagnosed by a hospital doctor (n = 530; 39%), GP (n = 249, 19%), or Nurse at the hospital (n = 142; 11%) or Nurse at the GP's (n = 144; 11%). Most parents reported that children were diagnosed by either a skin prick test (n = 463; 25%) or blood test for allergy (n = 425; 23%). See Annex B Table 39 for full breakdown.

The mean age for diagnosis of their child's reaction across all foods was 6.1 years old (combined SD = 4.2).

Figure 40: Diagnosis by hypersensitivity



Base: Diagnosis for all foods reported on in each hypersensitivity group (1382): Food allergy (574); Food intolerance (196); Coeliac disease (26); Multiple FHs (586).

About their reaction

Many parents reported that their children had not had a reaction to their stated food in the previous 12 months (n = 350; 24%) but for 74% (n = 1063) of all reactions, their child had had a reaction. For parents of children with allergy (17% of reactions) or multiple hypersensitivities (24% of reactions), a reaction was most likely to have occurred once in the last 12 months. For those reporting children with food intolerance, a reaction was most likely to have occurred between 3-6 times (28%) and for children with coeliac disease, a reaction was most likely to have occurred once or 3-6 times (23% each respectively) in the last 12 months (if they had experienced a reaction; Annex B Table 40).

Parents also reported where their child's most recent reaction occurred (for example, where their child first started experiencing symptoms of a reaction), however this does not give any information about where the food itself was prepared. The majority of reactions were reported by

parents to have happened at home (52%, n = 715), with school as another common place for them to have happened (14%, n = 189). This was also reflected across the hypersensitivities, except for parents reporting on children with multiple hypersensitivities (n = 116, 20%) and coeliac disease (n = 4, 17%), who also reported that their child reacted at their place of work (for those children who were 16-17 years old) (Annex B Table 41).

Anaphylaxis

The total number of anaphylactic reactions that children had ever experienced, reported by parents was 657 (47% of all reactions that were reported on across the three foods), of which 60% of these reactions were experienced by children in the multiple hypersensitivities group, 34% (n = 223) were experienced by children in the food allergy group, 4% (n = 28) by those with food intolerance and less than 1% (n = 3) with coeliac disease. For anaphylactic reactions occurring within the last 12 months, parents reported 488 (35% of all reactions that were reported on across the three foods) reactions, the majority of these were reported by parents of those with multiple hypersensitivities (n = 338; 69%). However, 24% (n = 118) of all anaphylactic reactions were reported by parents in the food allergy group, indicating that children with multiple hypersensitivities were most likely to report an anaphylactic reaction (see Annex B, Tables 43 and 44). A small percentage from the food intolerance (4%) and coeliac disease (<1%) groups also reported anaphylactic reactions.

Further, for 63% (n = 913) of all reactions reported, parents reported that their child had been prescribed an adrenaline auto-injector, of which 54% (n = 490) of these responses were reported by parents of children in the multiple hypersensitivities group, 40% (n = 363) were those with food allergy, 4% (n = 36) were those in the food intolerance group and less than 1% (n = 5) were those with coeliac disease.

Treatment

Parents were asked about the treatments their children had received for reactions to food reported. For 45% of reactions, parents reported treating these themselves. This was also true across hypersensitivities (see Annex B, Table 42), however for parents of children with multiple hypersensitivities, parents also reported that for 28% of reactions their child treated their reaction themselves and for 26% of reactions, the reaction was treated by someone medical.

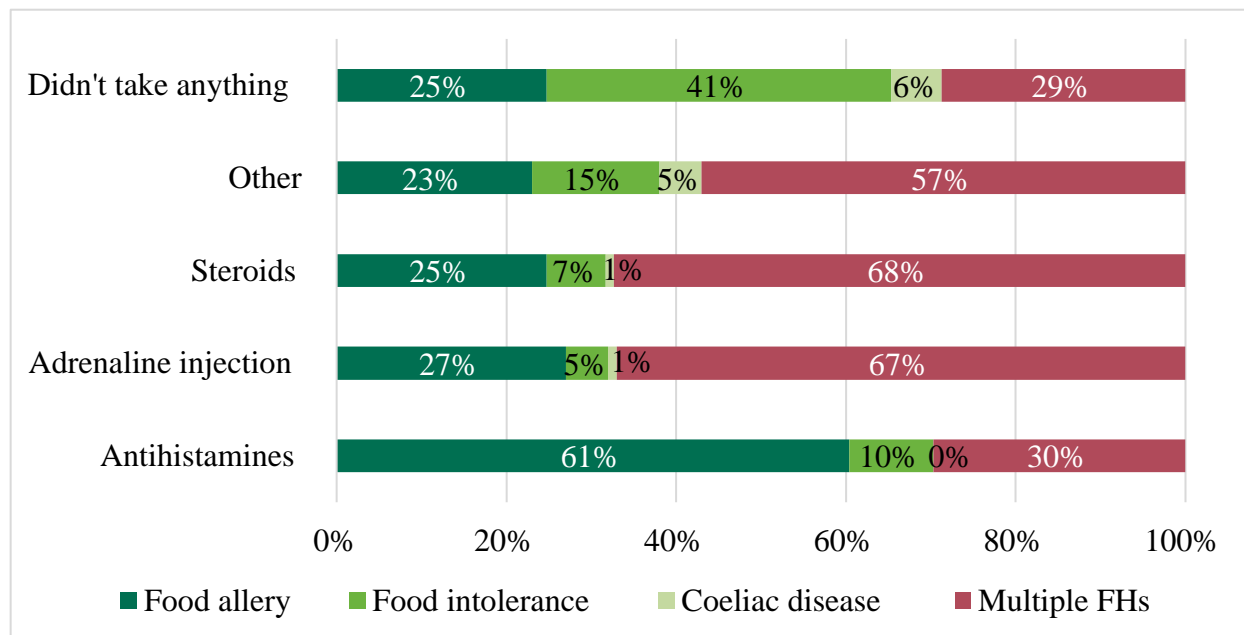
Parents were also asked about treatments given by themselves or a non-medical person and by those that were administered by a medical professional. For reactions that were treated by a non-medical person, antihistamines were reported as the most common treatment 40% (n = 500). For treatments administered by a medical professional, adrenaline injections (25%, n = 125) were the most commonly reported treatment. Treatments were most commonly reported by parents of children with food allergy and multiple hypersensitivities (see Figures 41 and 42).

Hospital admission

For 47% (n = 648 out of 1386) of reactions to foods, parents reported they had called an ambulance for their children, and for 51% of all reactions (n = 710 out of 1,396 who answered) parents reported that their children had been admitted to hospital. For those that had been admitted to hospital (n = 700 respondents to this question), 23% (n = 162) had not been admitted in the last 12 months, 26% (n = 185) had been admitted once, 25% (n = 177) were admitted twice and 15% (n = 108) were admitted between 3-6 times, 7% (n = 46) were admitted between 7-10 times, 2% (n = 16) were admitted more than 10 times and 1% (n = 6) did not know (Annex B, Table 45). Across all foods reported on, for 79% (n = 539) of those going to hospital, parents reported that their children went to hospital the first time that they reacted to the stated food. Across hypersensitivities, 61% (n = 434) of those being admitted to hospital were children with

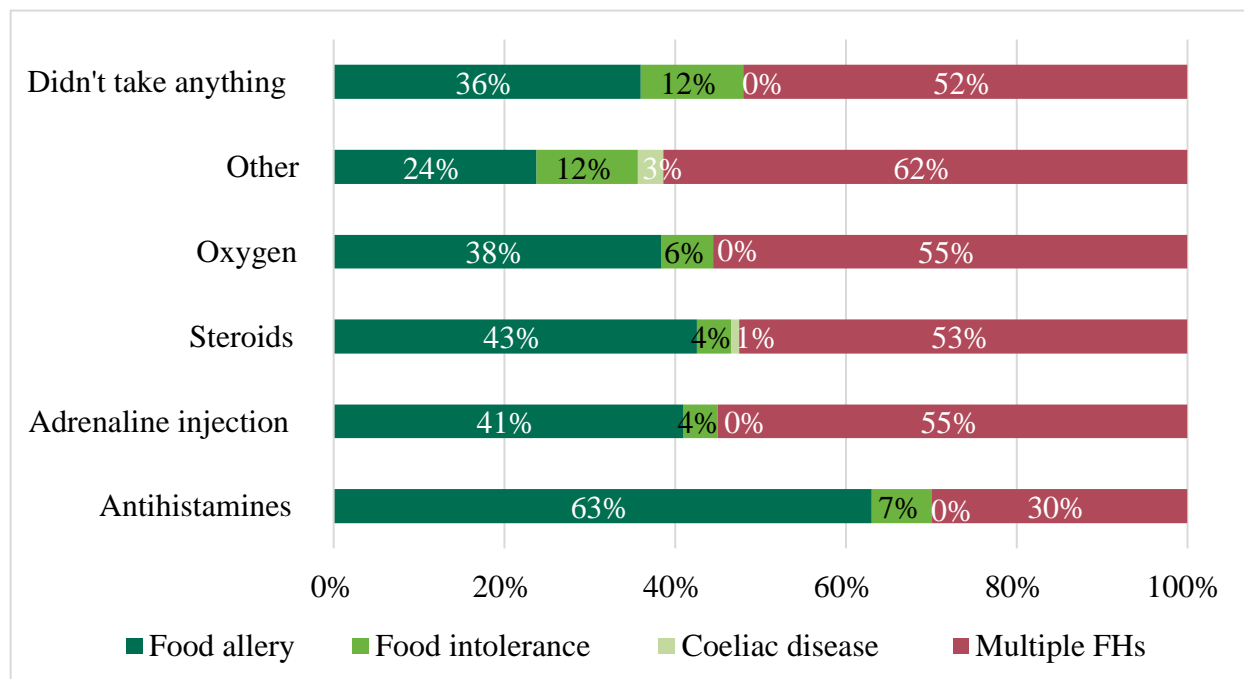
multiple hypersensitivities and 77% (n = 336) of these 434 went the first time they reacted. A further 31% (n = 220) of those admitted to hospital were children with food allergy, and 75% (n = 164) of these were also admitted the first time they reacted (Annex B, Table 46).

Figure 41: Treatments given by a non-medical person for reaction to foods, across hypersensitivity



Base: All treatments for foods reported on in each hypersensitive group (1,231): Food allergy (484); Food intolerance (172); Coeliac disease (22); Multiple FHs (553).

Figure 42: Treatments given by a medical professional, across food hypersensitivity



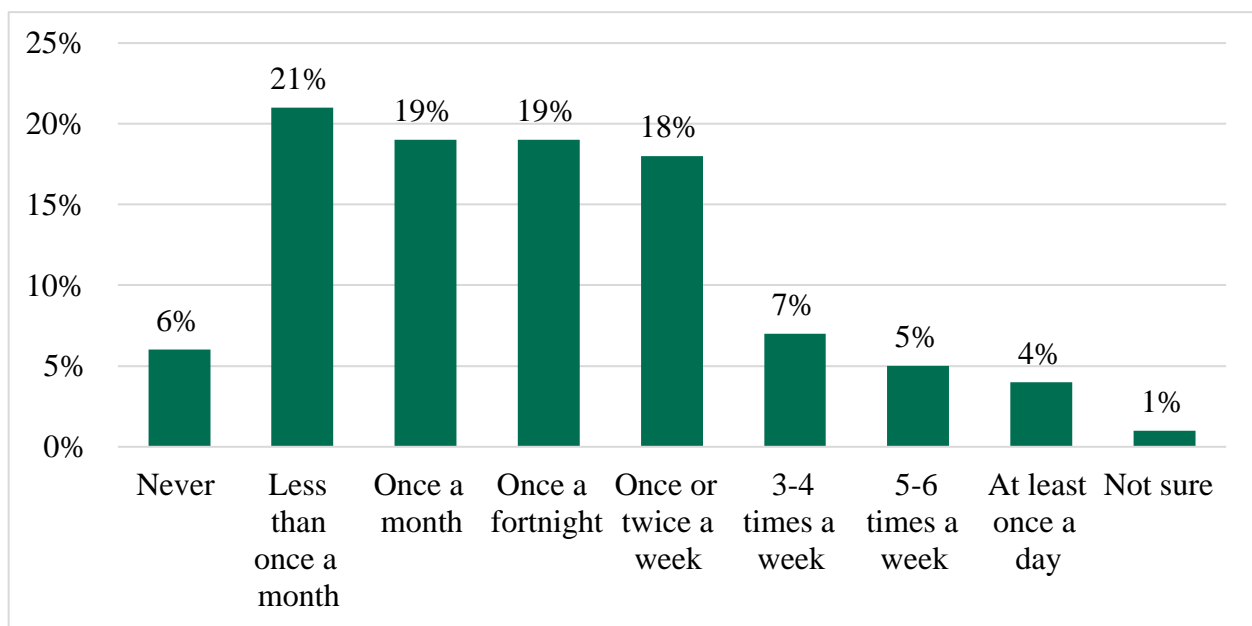
Base: All treatments for foods reported on in each hypersensitive group (493): Food allergy (221); Food intolerance (30); Coeliac disease (2); Multiple FHs (240).

Eating out

Parents were asked how often their households eat out or get food to take away from a restaurant or other food outlet. They were also asked how comfortable they felt with various aspects of eating out, such as asking for information from a member of staff. Participants were asked questions about their current eating out behaviour, however this was during the COVID-19 pandemic when restrictions on eating out were variable, and so responses may not reflect participants' usual behaviour.

Parent participants most commonly reported that their households eat out less than once a month (n = 139; 21%), however 72% (n = 470) eat out more frequently than this (Figure 43). There were significant differences by type of food hypersensitivity in terms of how often parents reported eating out, $F(3) = 20.1$, $p < .001$, $\eta^2 = .09$. Parents of children with multiple hypersensitivities reported eating out on average once a fortnight, which was significantly more often than those with food allergy and food intolerance, who on average ate out around once a month (all $ps < .008$; see Annex B Table 47).

Figure 43: How often parents' households eat out or get food to take away

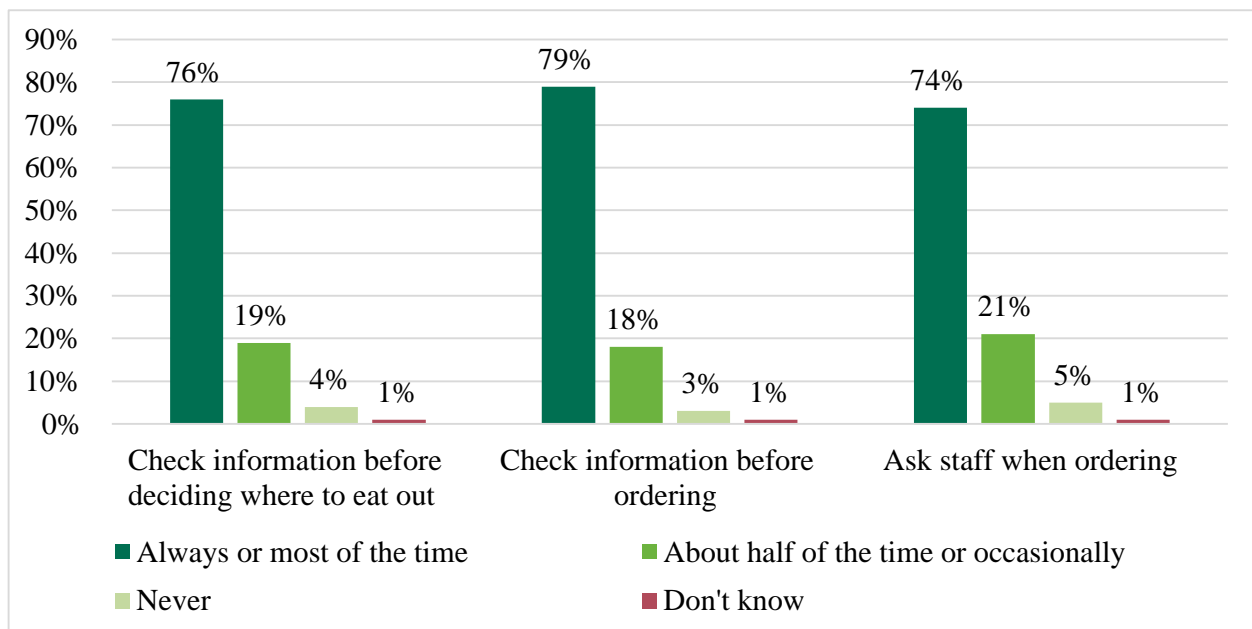


Base: All parents (653)

Checking information when eating out

Parents were asked how often they check that information is available that will allow them to identify foods that cause their children a bad or unpleasant physical reaction, before deciding where to eat out. They were also asked how often they review this information, and how often they ask a member of staff for this information. Parents reported that they almost always or most of the time check or review this information at each stage of eating out, with less than 5% at each stage reporting that they never check available information (see Figure 44).

Figure 44: How often participants review information when eating out

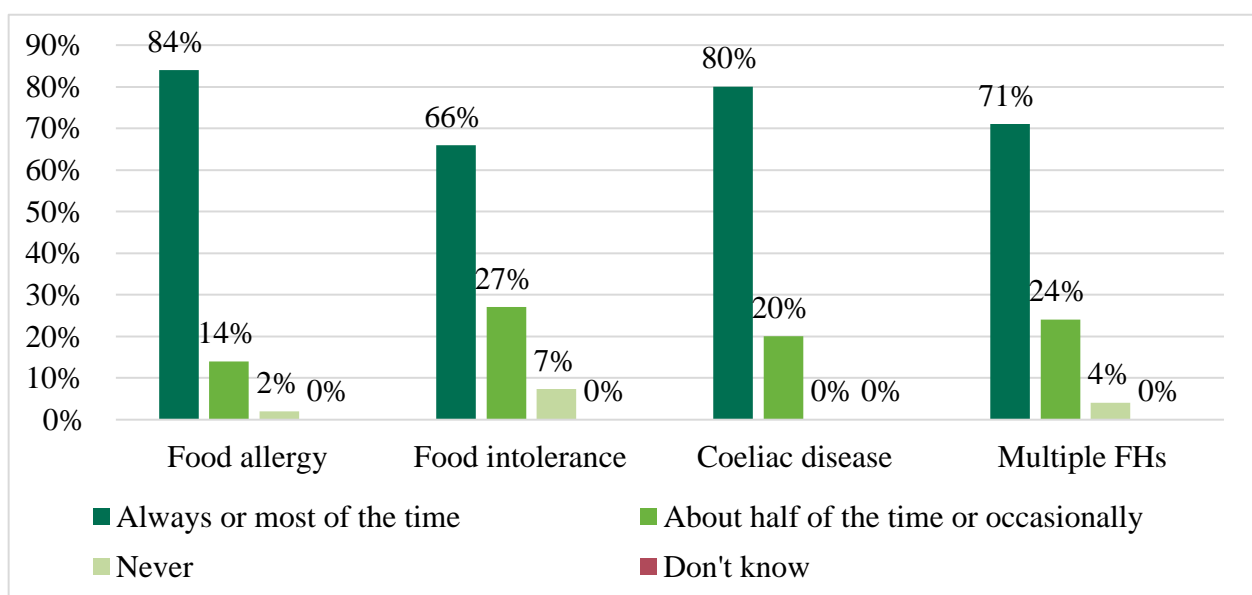


Base: All parents: Check information before choosing where to eat out (613); Check information when ordering (604); Ask staff when ordering (605).

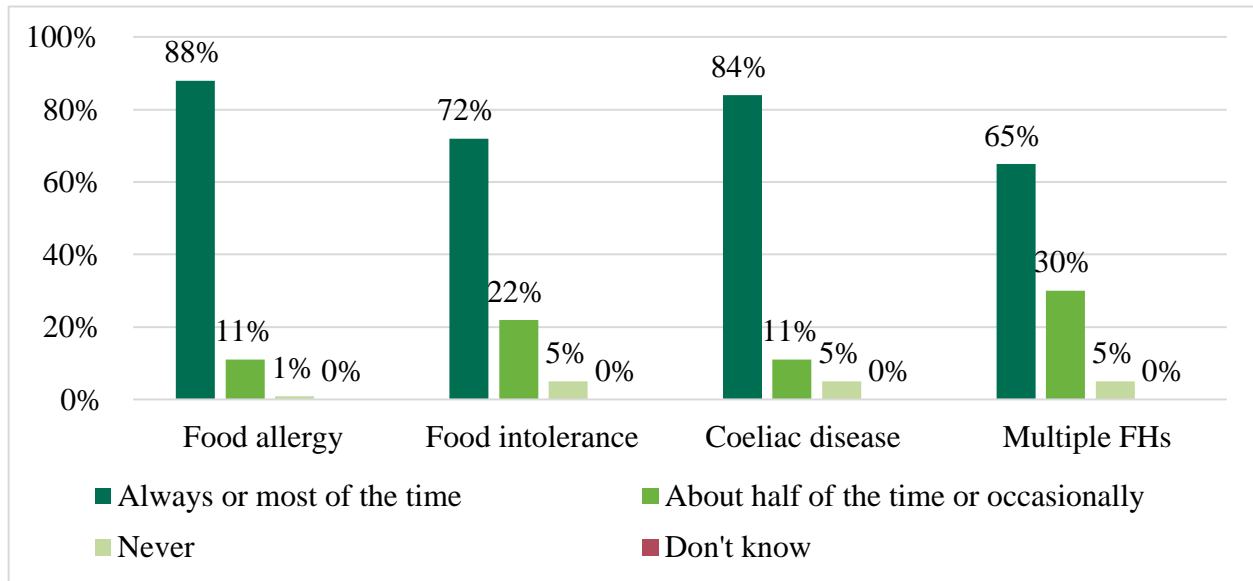
There were significant differences between hypersensitivity groups for how often parents reported checking and reviewing information. Participants with children with food allergy (mean = 4.4, SD = 1.0) reported they check that there is information available before deciding where to eat out significantly more often than those with children with food intolerance (mean = 3.8, SD = 1.3) or multiple hypersensitivities (mean = 3.9, SD = 1.2; all $p < .008$), on average reporting that they always check this, or most of the time (Figure 45).

When asked how often parents review the available information before ordering food, parents of children with food allergy (mean = 4.5, SD = 0.9) reviewed this information always or most of the time, and significantly more often than parents of children with food intolerance (mean = 3.9, SD = 1.3) and multiple hypersensitivities (mean = 3.8, SD = 1.3; all $p < .001$), who only checked either about half or most of the time (Figure 46).

Figure 45: How often parents check information before choosing where to eat out, by hypersensitivity



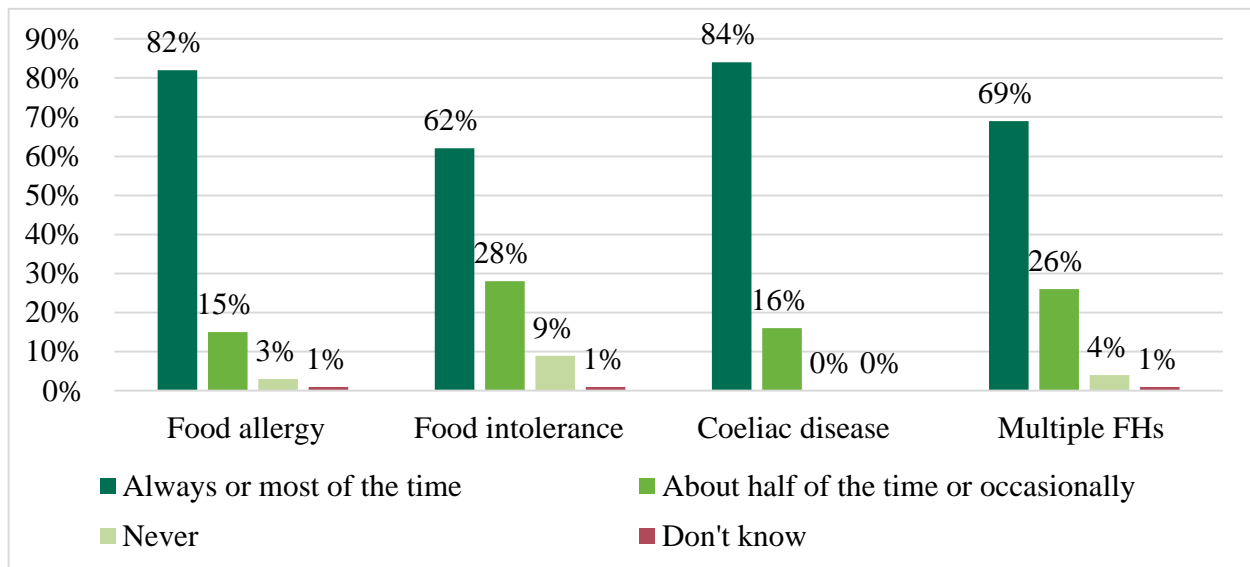
Base: All parents of children with a hypersensitivity (593): Food allergy (313); Food intolerance (148); Coeliac disease (20); Multiple FHs (112).



Base: All parents of children with a hypersensitivity (588): Food allergy (313); Food intolerance (149); Coeliac disease (19); Multiple FHs (107).

Finally, parents of children with food allergy (mean = 4.4, SD = 1.1) on average reported asking staff for information that enables them to identify foods that cause a bad or unpleasant reaction significantly more often than those with children with food intolerance (mean = 3.6, SD = 1.4) or multiple hypersensitivities (mean = 3.9, SD = 1.1; all ps <.008; Figure 47).

Figure 47: How often parents asked staff for information before ordering, by hypersensitivity



Base: All parents of children with a hypersensitivity (591): Food allergy (314); Food intolerance (150); Coeliac disease (19); Multiple FHs (108).

Confidence in information provided when eating out

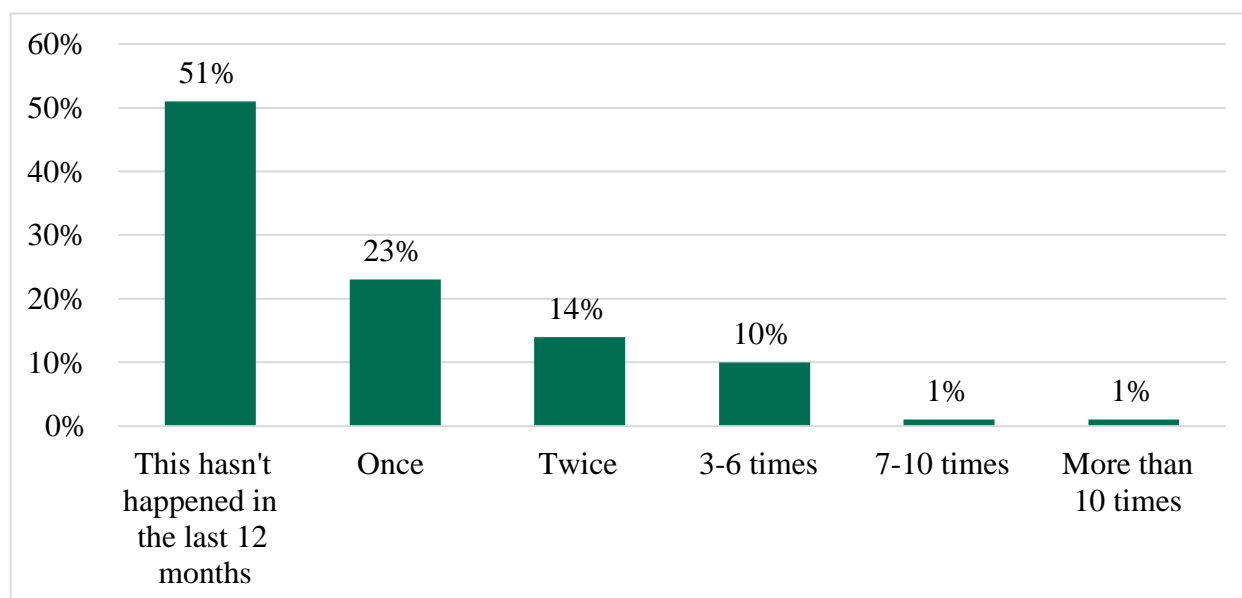
Parents were asked how comfortable they felt when asking a member of staff for information about the food they are selling because of a concern about their children experiencing a bad or unpleasant physical reaction. Parents were also asked how confident they were that the information provided to them when eating out allows them to identify foods that cause their child a reaction. The majority of participants were comfortable in asking for information when eating out (n = 433; 72% were very or fairly comfortable). This was reflected across the four hypersensitivity groups (Annex B Table 48). Additionally, those with food allergy (mean = 3.2, SD 0.9) and food intolerance (mean = 3.2, SD = 0.8) were significantly more comfortable with asking staff for allergen information than those with multiple hypersensitivities (mean = 2.9, SD = 1.0, both ps <.008).

Most parent participants were very or fairly confident (n = 390; 65%) that the written information provided when eating out allows them to identify foods that cause a bad or unpleasant physical reaction, and there were no significant differences observed between hypersensitive groups. The majority of participants were also very or fairly confident that information provided verbally by staff allows them to identify foods causing their child a reaction (n = 335; 55%). However, there were differences across hypersensitivities regarding confidence in information provided verbally by staff when eating out. Using a scale from 1 (Not at all confident) to 4 (very confident), parents of children with food allergy (mean = 2.6, SD = 1.0) were significantly less confident in verbal information provided by staff than parents of children with food intolerance (mean = 2.9, SD = 0.8; p = .004; see Annex B Tables 49 and 50).

Experiences when eating out

When asked how many times their children had been given a food that would cause a bad or unpleasant reaction in the last 12 months, despite them checking the available information, just over half of parents reported that this had not happened (n = 309, 51%), 37% reported that this had happened once or twice. This was also reflected across the hypersensitivities (see Figure 48 and Annex B Table 51).

Figure 48: How often parents reported their children being offered an allergen in the last 12 months when eating out

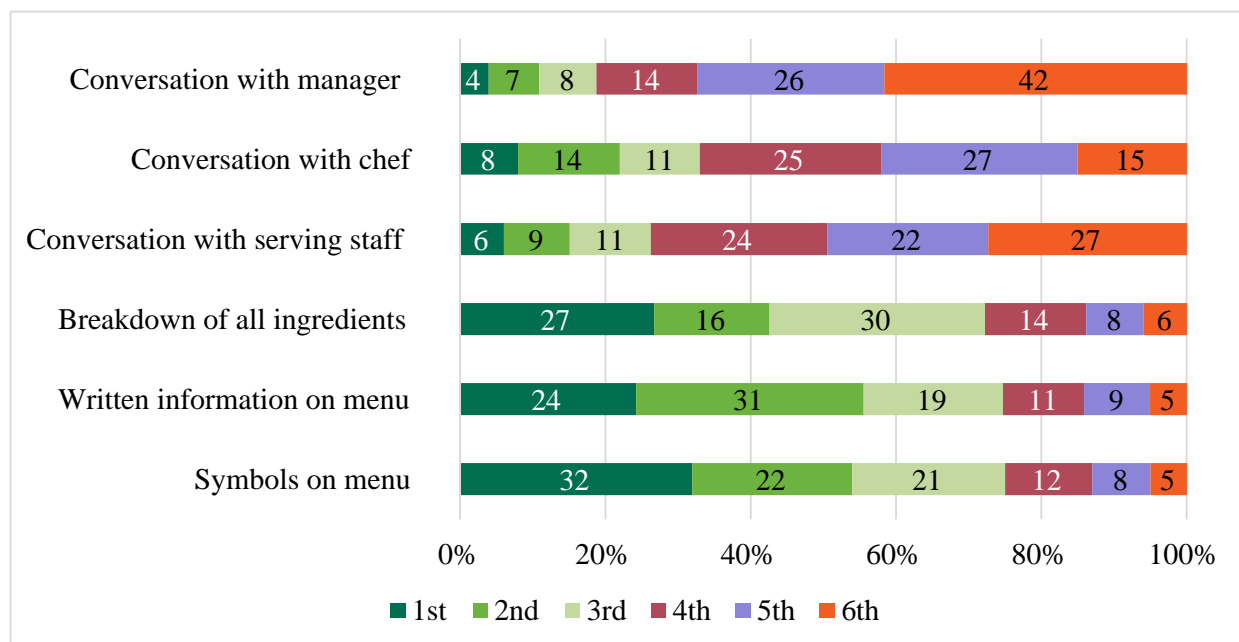


Base all parents (604)

Parents were also asked what sources of allergen information they found most useful when eating out, to avoid their child having a bad or unpleasant reaction. Menus with symbols indicating

allergens were rated as most helpful (n = 183; 32%), menus with written allergen information were the second most helpful sources of information (n = 180; 31%) and a breakdown of all the ingredients included in a dish was rated the third most helpful source of information (n = 169; 30%; Figure 49).

Figure 49: Rank of most useful sources of information for parents, when eating out

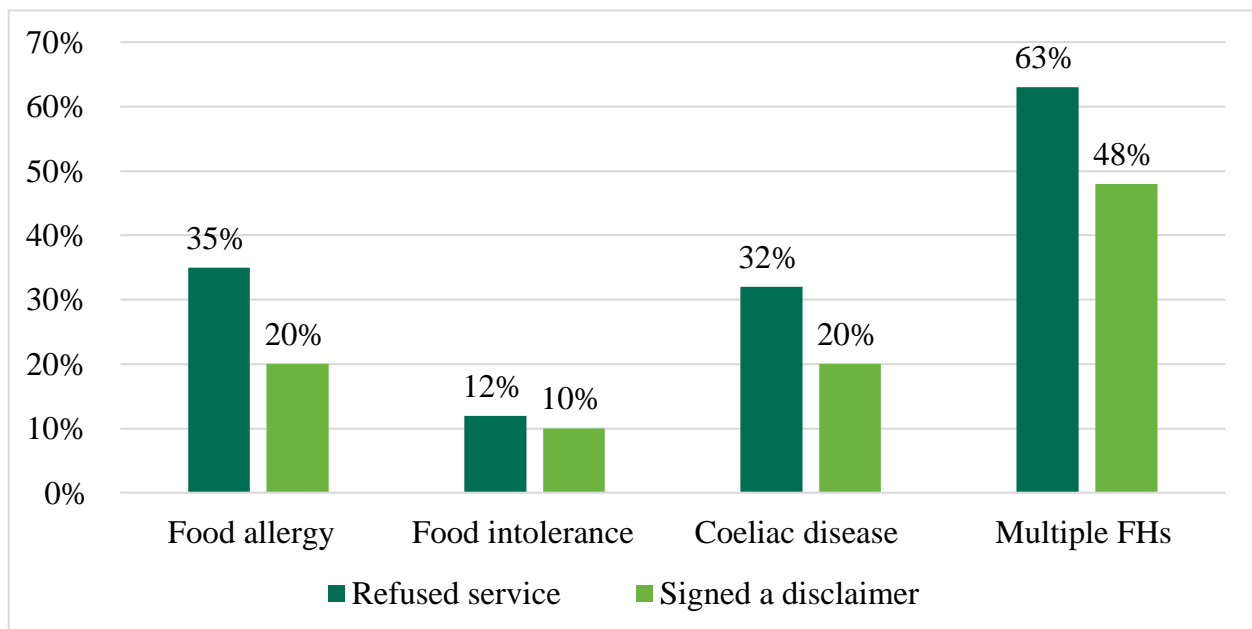


Base: All parents (572)

By hypersensitivity, for those with food intolerance the pattern was the same as for all parents, with the top three most useful sources of information when eating out being menus with symbols indicating allergens (n = 58, 48%), written information on menus (n = 50, 34%) and a breakdown of all ingredients on the menu (n = 54, 37%). However, for parents in the food allergy group both menus with symbols indicating allergens (n = 89, 29%) as well as a breakdown of all ingredients in dishes on the menu (n = 91, 30%) were rated as the most useful source of information. Additionally, for those with multiple hypersensitivities, menus with symbols (n = 28, 27% each) and written information on menus (n = 31, 30%) were ranked equally as first most useful sources of information. A breakdown of all ingredients was ranked as the third (n = 32, 31%) most helpful source of information when eating out for parents in the multiple hypersensitivities group.

Around a third (34%; n = 209) of parent participants reported having been previously refused service when eating out because of their child or children’s hypersensitivity (n = 400; 66% had not). Twenty three percent (n = 141) reported they had been asked to sign a waiver or disclaimer when eating out (n = 476; 77% had not). Additionally, of all parents while 63% of those in the multiple hypersensitivities group had been refused service, of those parents who had been refused service, parents of children with food allergy (55%) were significantly more likely to report being refused service, $\chi^2(3) = 73.7, p < .001$, demonstrating the larger sample of parents in the food allergy group (Figure 50).

Figure 50: Proportion of parents who have been refused service, and asked to sign a disclaimer when eating out, by child’s hypersensitivity



Base: All parents of children with a hypersensitivity. Refused service (609). Asked to sign a disclaimer (617): Food allergy (RS: 326; SD: 326); Food intolerance (RS: 152; SD: 155); Coeliac disease (RS: 19; SD: 20); Multiple FHs (RS: 112; SD: 116).

Quality of life

Food Hypersensitivity specific quality of life

Parents were asked to complete a parent-proxy Quality of Life scale relevant to the type of hypersensitivity for the first reaction of the first child they reported on in the survey. Parents were only asked to report on one child to minimise the burden on respondents. Parents of children with food allergy completed one of two versions of the Food Allergy Quality of Life Questionnaire (FAQLQ), for either children (age 0-12) or teens (age 13-17). Parents of children with food intolerance completed the Food Intolerance Quality of Life Questionnaire (FIQLQ) (for ages 0-17), for Coeliac Disease, parents completed the Coeliac Disease Quality of Life scale (CDDUX). Parents of children with multiple hypersensitivities completed whichever of these was appropriate to the first child they reported (for example, if someone reported food allergy to their child's first food, intolerance to their second and third, they completed the FAQLQ).

Quality of life, as reported by all parents

The FAQLQ and FIQLQ were rated on a scale from 1 (least impact on QoL) to 7 (most impact on QoL). The CDDUX was rated on a five-point scale. On all scales, the means were used, with high scores indicating most impact on quality of life (scores for the FAQLQs and FIQLQ are out of 7, which is the highest score, and for the CDDUX, scores are out of 5). Two separate versions of the FAQLQ were used, a child (8-12) and teen (13-17) appropriate scale, which were scored in the same way as above. These different scales use age-appropriate phrases to refer to common aspects of having food allergy (for example, child FAQLQ: 'Because of food allergy my child's ability to take part in preschool/school events involving food (class parties/treats/lunchtime) has been limited vs. Teen FAQLQ: 'School trips away are not easy for my teenager'). Parents could then score the extent of the impairment on their child's quality of life from 1 (least impairment) to 7 (most impairment to QoL) ([footnote 1](#)).

Parents of children with food allergy reported high mean scores (4.5 and 4.9 out of 7), indicating that parents of children with food allergy believe their child's quality of life is impaired either 'quite

a bit' or 'very much'. Parents of children with coeliac disease also rated the mean impairment on their child's quality of life as 3.4 out of 5, indicating high impairment (Table 2).

Table 2: Mean Quality of Life scores for each FH specific scale (all parents)

Measure	FAQLQ Child (food allergy) N=274	FAQLQ Teen (food allergy) N=88	FIQLQ (food intolerance) N=160	CDDUX (Coeliac disease) N = 36
Mean Total (SD)	4.5 (1.3)	4.9 (1.1)	4.5 (1.3)	3.4 (1.0)
Out of a possible total of:	7	7	7	5

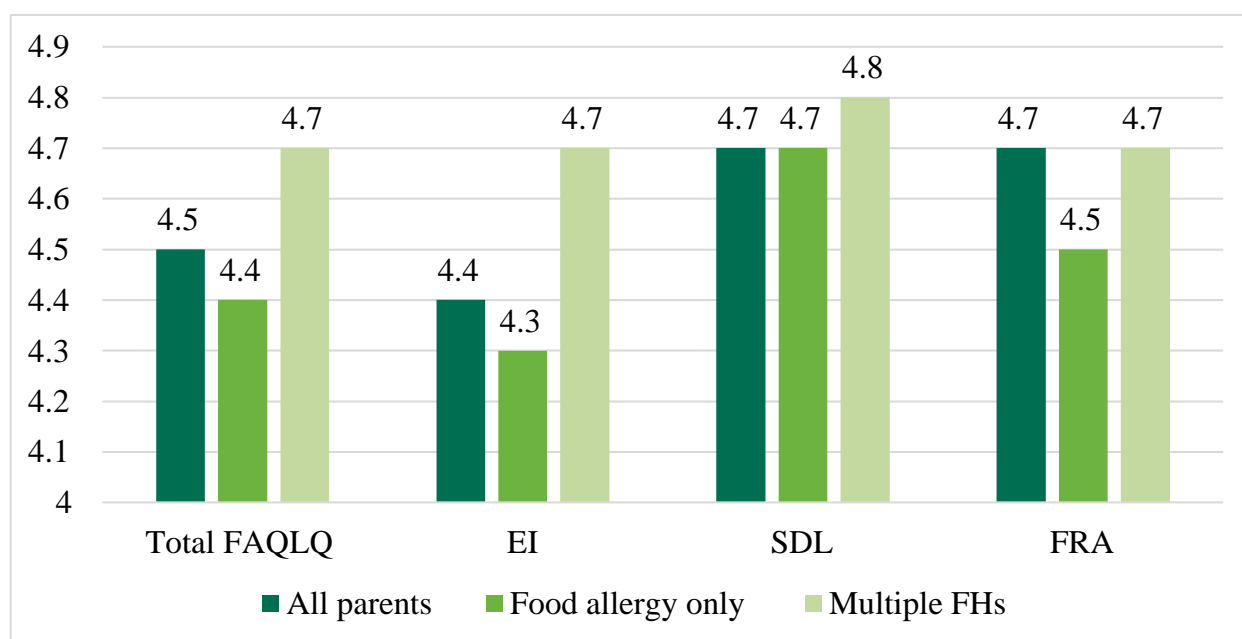
Quality of Life in younger children with food allergy, reported by parents

Each quality of life scale consists of food hypersensitive specific subscales. For the child FAQLQ, these are: Emotional Impact (EI), which refers to the worries and concerns related to having the food allergy their child experiences; Social and Dietary Limitations (SDL), which refers to how restricted their child's diet and social activities are as a result of having a food allergy; and Food Allergy Related Anxiety (FRA), which refers to the anxiety they think their child experiences around eating and trying foods as a result of having food allergy. A total of 247 parents of 0-12-year-olds with food allergy completed the FAQLQ (of which 197 were from the food allergy only group; the remaining 50 from the multiple hypersensitivities group).

Parents scored their child's QoL similarly high for total and all subscales, indicating a higher impact on quality of life than average (median quality of life = 4; mean total for sample = 4.5, SD = 1.3). For the food allergy only group, the mean total score for the FAQLQ was also higher than average (mean = 4.4, SD = 1.3). This was also true for the subscales, particularly for the social and dietary limitations subscale (mean = 4.7, SD = 1.4), which indicated that parents perceived that social and dietary limitations due to food allergy had the most impact on their child's quality of life.

Parents of children with multiple hypersensitivities scored the impact on their child's quality of life higher than those with reporting only food allergy (mean = 4.7, SD = 1.1) and means for subscales also indicated that according to parents, social and dietary limitations had the most impact on their child's quality of life. Means for each of subscale are shown in Figure 51.

Figure 51: Mean FAQLQ Child scores by all parents, parents of children with food allergy only, and parents of children with multiple hypersensitivities



Base: All parents completing the FAQLQ for children with allergy aged 8-12 (247): Children with only food allergy (197); children with allergy as multiple hypersensitivities (50) Scores out of 7

Clinical factors were examined to see if they were significantly associated with parents perceived impairment to food-related quality of life in younger children with food allergy. Children with non-food allergies in addition to a food hypersensitivity (for example, cat/dog, bee/wasp, medication) had significantly more impairment of quality of life (mean= 4.9 SD= 1.2) than those who didn't (mean= 4.2, SD=1.2, $t(156)= 3.25$, $p = .001$).

Parents reported that those children who had been prescribed an auto-injector had significantly more impairment of quality of life (mean= 4.8 SD= 1.28) than those who had not (mean= 4.0, SD= 1.3, $t(165) = 3.62$, $p= .001$). Children who had experience of anaphylactic shock to the first stated food also had significantly more impairment of quality of life (mean= 4.8 SD= 1.2) than those who had not (mean= 4.3 SD= 1.3, $t(145)= 2.64$, $p = .009$). This was also the case for children whose parents had called an ambulance for their reaction (mean = 4.8, SD = 1.2) compared to those whose had not (mean = 4.3, SD = 1.2, $t(157)= 2.61$, $p = .01$), as well as those children who had been admitted to hospital in an emergency for their reaction to food one (mean= 4.8 SD= 1.2) compared to those who had not (mean= 4.3 SD= 1.3, $t(158)=2.82$, $p = .005$).

Other factors related to eating out were also significantly correlated with parent's perceived quality of life of younger children with food allergy. How often they checked information before choosing where to eat out ($r = .27$), reviewed this information before ordering ($r=.19$) and asked staff for available information ($r = .24$) were all significantly correlated to impairment of their child's quality of life (all $ps<.05$).

A regression model was run to see which of the variables described above might predict level of quality of life. All of the variables above which had a significant association with quality of life were included in the model ($n = 8$ predictors). The overall model was significant ($p<0.01$), however only 8% of the variance in quality of life was explained, indicating that 92% of the variance was due to other unknown factors. None of the predictors were significant (standardised betas ranged from -0.07 to 0.23 and confidence intervals for each predictor crossed zero).

Quality of Life as reported by parents, in teens with food allergy

The teen scale of the FAQLQ is made up of the subscales: Emotional Impact which refers to the teenager's anxiety and worries about consuming a food which will result in a food allergic reaction; Dietary Frustrations and Social Restrictions, which refers to the frustrations and social impact felt by their teenager as a result of restricting their diet and social activities due to having a food allergy; and Food Allergy Awareness which refers to behaviours (for example, checking labelling) and the need for awareness around food their teenager has, due to having a food allergy. A total of 88 parents of teens completed the FAQLQ. This comprised of 73 parents from the food allergy only group, and 15 parents of children who have multiple hypersensitivities (thus, this subgroup will not be reported on).

Overall, mean totals for the food allergy only parents and all parents were almost identical, and indicated higher than average impact on quality of life (mean = 4.9, SD = 1.1). Scores on the psychological impact (mean = 5.1, SD = 1.4) and food allergy awareness (mean = 5.3 and 5.2 respectively, SD = 1.4) subscales were highest, indicating these elements of managing food allergy have the most impact on quality of life in teens with food allergy, according to their parents.

Clinical factors were examined to see if they were significantly associated with parents perceived impairment to quality of life in teens with food allergy, however there were no significant differences for teens without or without these on impact of quality of life (all $ps >.05$).

Parents' reported severity of their teen's reaction was significantly positively correlated with perceived impairment to quality of life ($r = .41$; $p < .001$). Those who had been prescribed an auto-injector had significantly more impairment of quality of life (mean=5.1 SD= 0.9) than those who had not (mean=4.4, SD= 1.2, $t(35.9) = 2.87$, $p = .002$). Teens who had experience of anaphylactic shock to the first stated food also had significantly more impairment of quality of life (mean = 5.1, SD= 0.9) than those who had not (mean= 4.5 SD=1.2, $t(68) = 2.41$, $p = .02$).

Other factors related to eating out were significantly correlated with parent's perceived quality of life of older children with food allergy. How often parents checked information before choosing where to eat out ($r = .26$), as well as how often they asked staff for available information ($r = .24$), were both significantly and positively correlated to impairment of their adolescent's quality of life (all $ps < .05$).

A regression model was run to see which of the variables described above might predict level of quality of life. All of the variables above which had a significant association with quality of life were included in the model ($n = 5$ predictors). The overall model was significant ($p < 0.01$) and 16% of the variance in quality of life was explained, indicating that 84% of the variance was due to other unknown factors. However, only severity of reaction reported by parents significantly predicted impairment to quality of life (standardised beta = .32), indicating that the greater parents reported their teenager's reaction to be, the more impaired they reported their teenager's quality of life to be. None of the other predictors were significant, as confidence intervals for each predictor crossed zero.

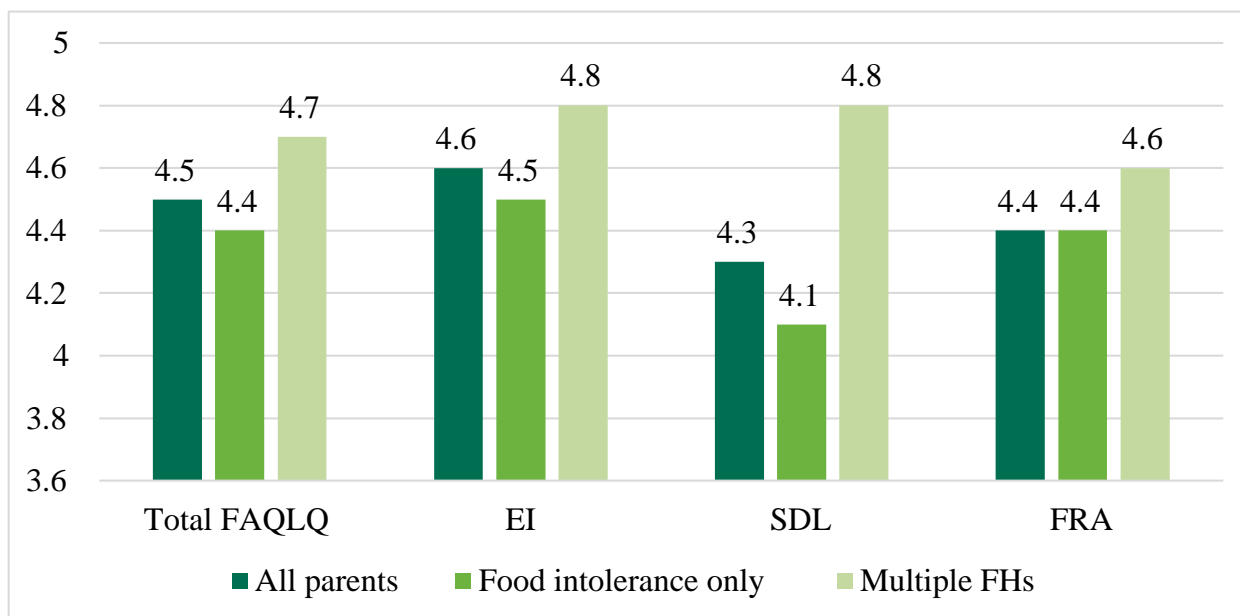
Quality of Life in children with food intolerance, reported by parents

For the FIQLQ, subscales are: Emotional Impact (EI), which refers to the worries and concerns of their child about having food intolerance; Social and Dietary limitations (SDL), which refers to the impact and limitations on social activities and diet as a result of having food intolerance; and Reactions and Avoidance (RAv), which refers to the awareness needed by their child to avoid and check foods in relation to their food intolerance. A total of 160 parents of children with food intolerance completed the FIQLQ, of which 120 were those with children with food intolerance only and 40 were those with children with multiple hypersensitivities.

Parents reported slightly higher than average impact on quality of life for children with food intolerance (median = 4; mean = 4.5, SD = 1.3). On average, parents of children who only had food intolerance reported slightly less impact on quality of life (mean = 4.4, SD = 1.3) than parents of children with food intolerance as part of multiple hypersensitivities (mean = 4.7, SD = 1.1).

Parents reported the emotional impact of having food intolerance as having the most impact on their child's quality of life (mean = 4.6, SD = 1.3; see Figure 52). The scores for the social and dietary limitations subscale were the most diverse. Parents of children with food intolerance only, reported less impact of having a food intolerance on quality of life (mean = 4.1, SD = 1.6) in relation to their child's social and dietary restrictions than those with multiple hypersensitivities (mean = 4.8, SD = 1.2; see Figure 50).

Figure 52: Mean FIQLQ scores by all parents, parents of children with food intolerance only, and parents of children with multiple hypersensitivities



Base: All parents completing the FIQLQ for children with intolerance (160); Children with only food intolerance (120); children with intolerance as multiple hypersensitivities (40)

Clinical factors were examined to see if they were significantly associated with parents perceived impairment to quality of life in children with food intolerance. The severity of the reaction to the first food parents reported their child had a reaction to was significantly positively correlated with impairment to their child's quality of life ($r = .25$; $p = .004$). Those who had been prescribed an auto-injector had significantly more impairment of quality of life (mean= 4.9 SD= 1.2) than those who had not (mean= 4.3 SD= 1.3, $t(126) = 2.63$, $p = .009$). Children who had experience of anaphylactic shock to the first stated food also had significantly more impairment of quality of life (mean= 5.0, SD= 1.1) than those who had not (mean= 4.2 SD= 1.3, $t(121) = 3.19$, $p = .002$). This was also the case for children whose parents had called an ambulance for their reaction (mean = 5.0, SD = 1.0), compared to those whose parents had not (mean = 4.2, SD = 1.4, $t(124) = 2.94$, $p = .004$), as well as children who had been admitted to hospital in an emergency for their reaction to food one (mean= 5.0, SD=1.1) compared to those who had not (mean= 4.2 SD= 1.3, $t(123) = 3.45$, $p = .001$).

Factors related to eating out were also significantly correlated with parent's perceived quality of life of their children with food intolerance. Frequency of checking available information when choosing where to eat out ($r = .42$), as well as checking available information before ordering ($r = .37$) and how often parents asked staff for available information when eating out ($r = .42$) were all significantly correlated with parents' perceived impairment to their child's quality of life (all $ps < .001$).

A regression model was run to see which of the variables described above might predict level of quality of life. Variables above which had a significant association with quality of life were included in the model ($n = 8$ predictors). The overall model was significant ($p < .001$) and 22% of the variance in quality of life was explained, indicating that 78% of the variance was due to other unknown factors. No single predictor was significant (confidence intervals crossed zero).

Quality of Life in children with coeliac disease, reported by parents

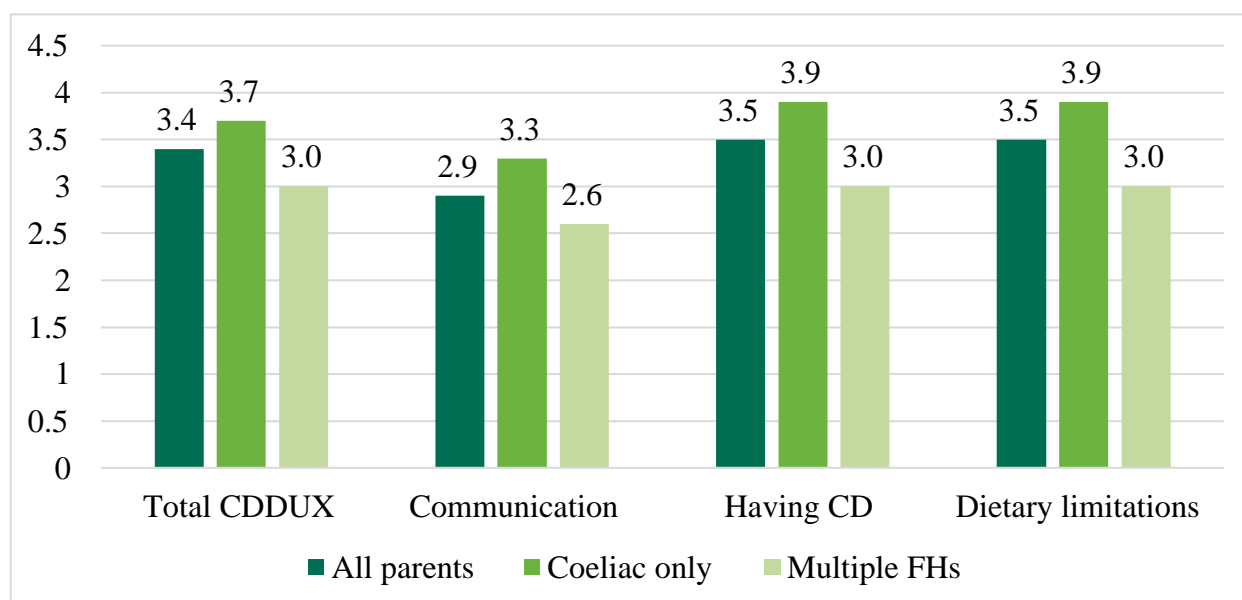
For the CDDUX, subscales comprised Communication, referring to the impact felt by their children about talking about having coeliac disease, Having Coeliac Disease, referring to the impact on their child's quality of life when thinking about foods they cannot eat or being offered food containing gluten, and Dietary limitations, referring to the impact that eliminating gluten from their diet has on their child's quality of life. The CDDUX is scored on a 5-point Likert scale and

parents of both younger and older children completed the same scale. A total of 36 parents of children with coeliac disease completed the CDDUX, of which 20 parents were those of children with only coeliac disease, and 16 were parents with coeliac disease among multiple hypersensitivities (thus, as numbers are small for the multiple hypersensitivities group, this data will not be reported on here).

Overall, parents of children with coeliac disease reported the impact on their child's quality of life as high (mean = 3.4, SD = 1.0). This was highest on the 'Having Coeliac disease' and 'Dietary Limitations' scales, and indicated that parents rated their children having to manage being offered foods they cannot eat, and thinking about the foods they cannot eat because of having coeliac disease, as well as having to eliminate gluten-containing foods from their diet as having the most impact on their child's quality of life (see Figure 53 for means).

Clinical factors were not examined to see if they were significantly associated with parents perceived impairment to quality of life in children with coeliac disease as numbers were too low in each of the groups.

Figure 53: Mean CDDUX scores, by all parents, coeliac disease only parents and those with children with multiple hypersensitivities



Base: All parents completing the CDDUX for children with coeliac disease (36): Children with coeliac disease only (20); children with coeliac disease as one of multiple hypersensitivities (16).

Differences in Quality of Life by hypersensitivity

Where possible, comparisons in quality of life scores were made for parents reporting age and gender of the first child, numbers of foods and severity of reaction. Comparisons for different ethnic groups could not be made as there were not enough children reported by parents from each ethnic group to make meaningful comparisons. This was also the case for comparing groups based on clinical vs self-diagnosis, and numbers of foods. Where more than two groups are compared, a Bonferroni correction has been applied to the significance level of 0.05 (/3 in all cases), thus a new level of .016 was used for more than two comparisons.

Food allergy only (child FAQLQ)

Of the food allergy only group, 197 parents completed the FAQLQ.

Age

Pearson's correlation was carried out to investigate whether the child's age correlated with FAQLQ scores. However, this was not significant, $r(129) = .008$, $p = .93$, indicating that age of the child had no significant association with the impact of their food allergy on their child's quality of life.

Gender

Of those with food allergy only, parents completed the quality of life scale for 77 male children and 52 female children. There was no significant difference in impact upon quality of life for male and female children with food allergy, $t(127) = 0.14$, $p = .89$. Means were similar for quality of life between males (mean = 4.4, SD = 1.3) and females (mean = 4.5, SD = 1.4) indicating parents rated the impact on quality of life for both genders as similar.

Severity

As numbers for a mild reaction to food allergy were low, reactions were recoded into mild or moderate ($n = 74$) and severe ($n = 54$). However, there were no significant differences in parent's reported impact upon quality of life for the severity of their child's allergic reaction, $t(126) = -1.16$, $p = .25$. Parents reporting a mild or moderate reaction for their child's first food (mean = 4.3, SD = 1.2) and those reporting a severe reaction (mean = 4.6, SD = 1.4) reported around the same impact on their child's quality of life.

Number of foods

For their first child, 89 parents reported one food and 40 parents reported two or three foods. There were no significant differences in reported impairment to quality of life for those parents who reported one food (mean = 4.4, SD = 1.3) and more than one food (mean = 4.5, SD = 1.4; $t(127) = -0.22$, $p = .83$).

Food allergy only – (teen FAQLQ)

Of the food allergy only group, 73 parents completed the FAQLQ about their teen with allergy. Numbers in subgroups were too small to compare differences across number of foods reported by parents.

Age

For the teen FAQLQ, Pearson's correlation was also carried out to see if older children's age correlated with the Teen FAQLQ scores, however this was not significant, $r(67) = .03$, $p = .79$, indicating that the age of teens was not associated with their reported impact upon quality of life.

Gender

Parents reported 30 male children and 37 female teens with food allergy. However, there was no significant difference between impact upon quality of life between male and female teenagers with food allergy, $t(65) = 1.50$, $p = .14$. Means however indicated that parents reported that male teenager's quality of life was more impacted (mean = 5.1, SD = 1.0) than female teenager's quality of life (mean = 4.7, SD = 1.1), thus it may be that if groups were bigger, this difference would be significant.

Severity

Categories were recoded into mild or moderate (n = 33) and severe (n = 33). There were significant differences in parent's reported impact upon their teen's quality of life, for the severity of their teen's allergic reaction, $t(64) = -3.96, p < .001$. Parents reporting a mild or moderate reaction for their teen's first food (mean = 4.4, SD = 1.1) reported significantly less impact on quality of life than those reporting a severe reaction (mean = 5.3, SD = 0.8). Again, however, groups were still small and so these results may change with larger numbers.

Food intolerance only

Of the food intolerance only group, 120 parents completed the FIQLQ. Again, numbers in subgroups were too small to compare differences across number of foods, reported by parents.

Age

There was no significant difference in parents' scores between younger (0-12s) (mean = 4.2, SD = 1.4) and older children (13-18s; mean = 4.8, SD = 1.0), $t(91) = -2.14, p = .03$. Groups were, however, unequal (62 and 31) and so results should be taken with some caution.

Gender

Of those with food intolerance and who completed the FIQLQ, 43 were male, 50 were female. There were no significant differences in impact upon quality of life reported by parents for male children (mean = 4.5, SD = 1.3) or female children (mean = 4.3, SD = 1.3) with food intolerance, $t(91) = 0.60, p = .55$.

Severity

As the numbers of parents reporting mild (30), moderate (58) and severe (6) reactions were not equal, comparisons were only carried out for those with mild and moderate reactions to their first food. Those parents who reported that their child's reaction was mild (mean = 3.7, SD = 1.4) reported significantly less impairment to their child's quality of life because of having food intolerance than those who had a moderate reaction (mean = 4.6, SD = 1.2; $t(86) = -3.21, p = .002$).

Coeliac disease only

For those parents in the coeliac group, only 20 completed the CDDUX and so comparisons for this group will not be reported on.

Multiple hypersensitivities

For those with multiple hypersensitivities, 50 completed the child FAQLQ, 15 completed the teen FAQLQ, 40 completed the FIQLQ and 16 completed the CDDUX. Therefore, due to very small numbers, differences for this group will not be reported on.

Generic quality of life

Parents completed the EQ-5D-3L for the first child they reported on. Mean VAS scores (0=death and 100=full health) were highest for children with allergy (n = 340, mean = 80.98, SD = 16.79), followed by food intolerance (n = 156, mean = 78.11, SD = 20.52), coeliac disease (n = 19, mean = 77.84, SD = 15.97). Children with multiple FHs scored lowest of all (n = 124, mean = 70.10, SD

= 19.17). Across all children with FH on the EQ-5D-3L sub-domains, Pain and Anxiety dimensions were markedly worse than the other dimensions.

Comparisons between Wave 1 and Wave 2

A total of 77 parents completed both wave 1 and wave 2 (see Table 52 for a further breakdown). Across both waves, the majority of parents reported having children with food allergy (n = 52 at Wave 1 and n = 51 at wave 2), followed by multiple hypersensitivities, coeliac disease and food intolerance (see Figure 54). At wave 1, 3% (n = 2) and at wave 2, 3% (n = 2) also reported 'Other' reactions but these are not reported in the subsequent sub-analysis. It is important to note that at wave 1 a large proportion of parents reported on children with food allergy (n = 396, 58%) which may explain why the proportion of those in the food allergy group taking part at both time points is skewed (higher).

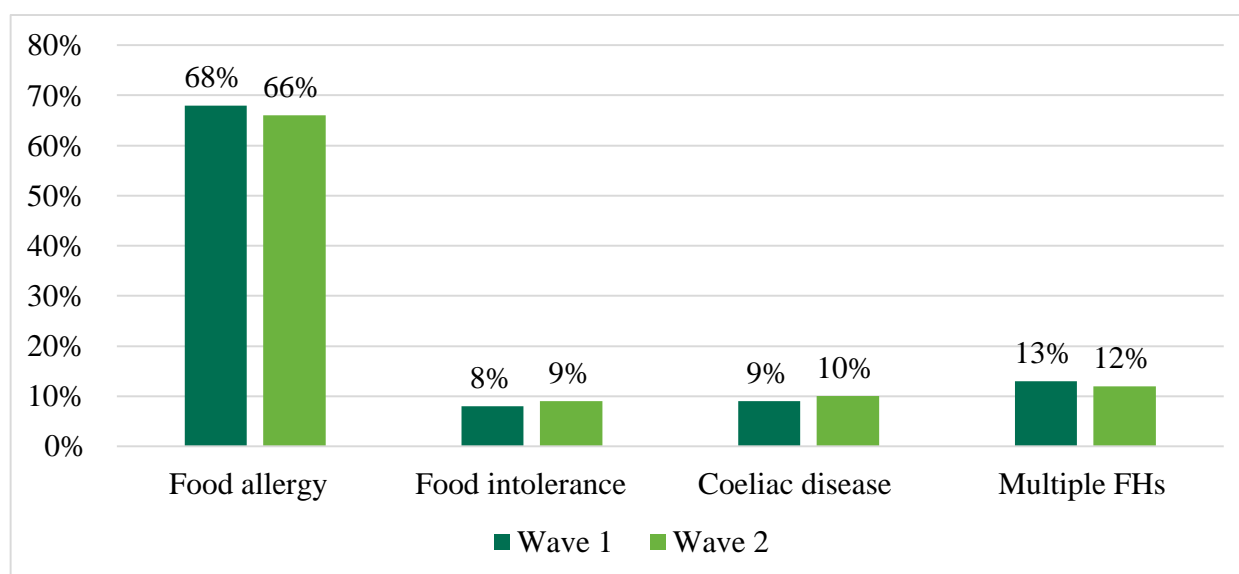
Eating out

Data was compared to see if there was any differences in how frequently participants ate out and checked available information when eating out.

There was a significant difference in how frequently parents at wave 1 (mean = 2.8, SD = 1.2) eat out, compared to at wave 2 (mean = 3.1, SD = 1.1) with participants reporting that on average they eat out less than once a month at wave 1 and around once a month at wave 2, $t(68) = -2.48$, $p = .02$. However, it is important to note that wave 1 data was collected at the time of the COVID-19 pandemic, so usual eating out behaviour may have been altered as a result of the restrictions associated with this.

However, there was no significant differences for how frequently parents checked available information when choosing where to eat out between wave 1 (mean = 4.6, SD = 0.9) and wave 2 (mean = 4.6, SD = 0.8) and before ordering between wave 1 (mean = 4.7, SD = 0.8) and wave 2 (mean = 4.8, SD = 0.6; both $ps > .05$), on average checking both of these most of the time or always. For frequency of asking staff for available information when eating out, there was no significant differences between wave 1 (mean = 4.7, SD = 0.9) and wave 2 (mean = 4.6, SD = 1.1, $p = .77$) with parents reporting that they check this most of the time or always.

Figure 54: Percentage of parents completing both wave 1 and wave 2 in each hypersensitivity group



Base: All parents completing both Waves with hypersensitivities: Food allergy (Wave 1: 52; Wave 2: 51); Food intolerance (Wave 1: 6; Wave 2: 7); Coeliac disease (Wave 1: 7; Wave 2: 8); Multiple hypersensitivities (Wave 1: 10; Wave 2: 9).

There were also no significant differences how comfortable parents of children with food hypersensitivities were in asking for information when eating out at wave 1 (mean = 3.3, SD = 0.9) and wave 2 (mean = 3.1, SD = 0.9). There were also no significant differences in how confident parents were in written information provided when eating out, reporting they were not very or fairly confident at wave 1 (mean = 2.7, SD = 0.7) and wave 2 (mean = 2.7, SD = 0.7). Finally, parents at wave 1 reported no significant differences in confidence in verbal information (mean = 2.4, SD = 0.8) than at wave 2 (mean = 2.5, SD = 0.8; all ps >.05), on average reporting that they are not very confident in verbal information provided by staff when eating out.

Quality of life

Comparisons for each of the food hypersensitivity specific quality of life measures (FAQLQ, FIQLQ and CDQoL) are not reported on as the numbers of parents completing the appropriate quality of life measure were too small to compare. For the generic QoL measure, scores in each sub-domain were lower at wave 2 compared to wave 1.

1. For further information please see the technical report.

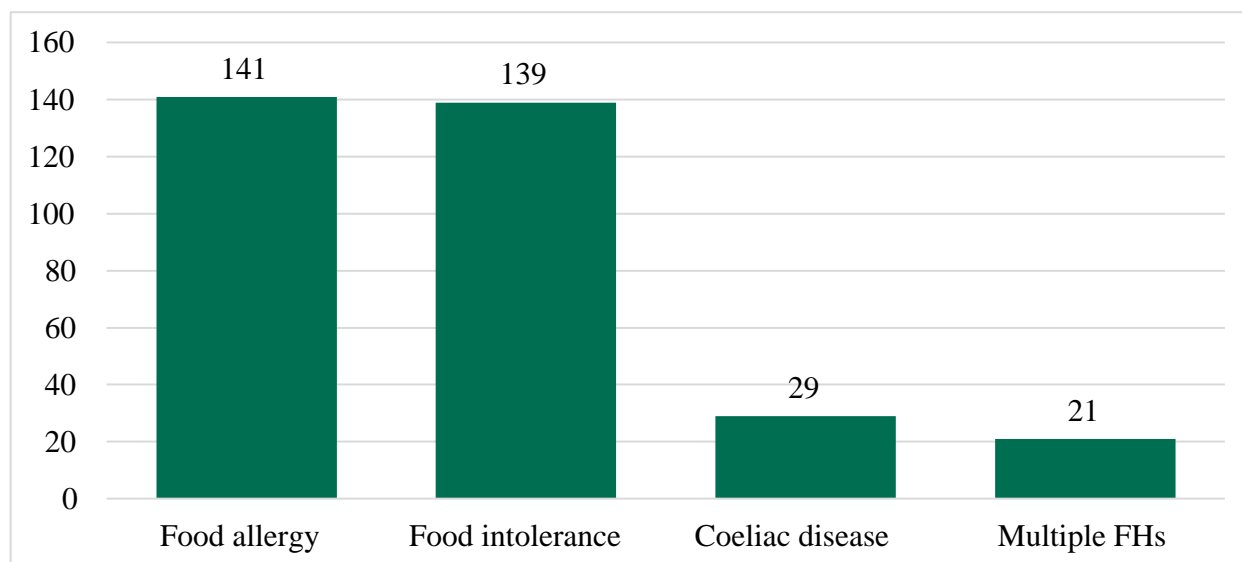
Part 3: Children with food hypersensitivities

A total of 349 children aged 8-17 years with FH completed the survey, which included 19 reporting 'Other' conditions or 'Don't know' when asked to describe their reaction to food. These participants are not reported on in analysis as a subgroup but are included in the descriptive 'all children' figures. Key statistics and comparisons for all groups are reported on, however due to small numbers of those with coeliac disease (n = 29) and multiple hypersensitivities (n = 21), significance testing for these groups is not included. As only 15 children (3 8-12 year olds and 12 13-17 year olds) from wave 1 also took part in wave 2, comparisons across the two waves were not carried out for children.

Prevalence of food hypersensitivities

Most of the child sample was made up of those with food allergy only (40%, n=141) and food intolerance only (40%, n=139). Group sizes for coeliac disease (n = 29; 8%) and multiple hypersensitivities (n = 21; 6%) were small (Figure 55).

Figure 55: Prevalence of children within the sample with each food hypersensitivity



Base: All children (excluding those reporting only 'other' or 'don't know'; 225): Food allergy (141); Food intolerance (139); Coeliac disease (29); Multiple FHs (21).

Profile of child participants

Children's key characteristics

From a total of 267 children, 52% (n = 182) of those reporting a food hypersensitivity were male (47%; n = 163 were female). The mean age of all children was 12.6 years old (SD = 2.9), with a range from 8 to 17 years old. The majority of children were from a White background (n = 300; 86%. See Annex C Table 53).

More male child respondents reported each of the hypersensitivities than females, with the highest percentage of males reporting multiple hypersensitivities (n = 15 out of 21, 71%). As with the whole sample, across all hypersensitivities, the majority of children were of White British ethnicity (see Table 53 for a full breakdown).

The most common region for all children living with a food hypersensitivity was London (n = 50, 14%). This was also true for those reporting food allergy (n = 29; 21%), however for those with food intolerance, the most common region was the South East of England (n = 23; 17%). For children with coeliac disease the most common region was the North West of England (n = 5; 17%) and for children with multiple hypersensitivities the South East of England was the most common region (n = 6, 26%). See Annex C Table 54 for a full breakdown.

Other long-term conditions

Children were asked if they had any other long-term physical or mental health conditions. Nineteen percent (n = 64) of the whole sample reported a long-term physical condition, 14% (n = 49) reported a mental health condition and 6% (n = 20) reported having both (60%, n = 207 did not have another long-term condition and 1%, n = 5 preferred not to say). Children with food allergy (n = 25; 18%) and intolerance (n = 23, 17%) were most likely to report having another long-term physical condition and children reporting a food intolerance were most likely to report having a mental health condition (n = 18, 13%).

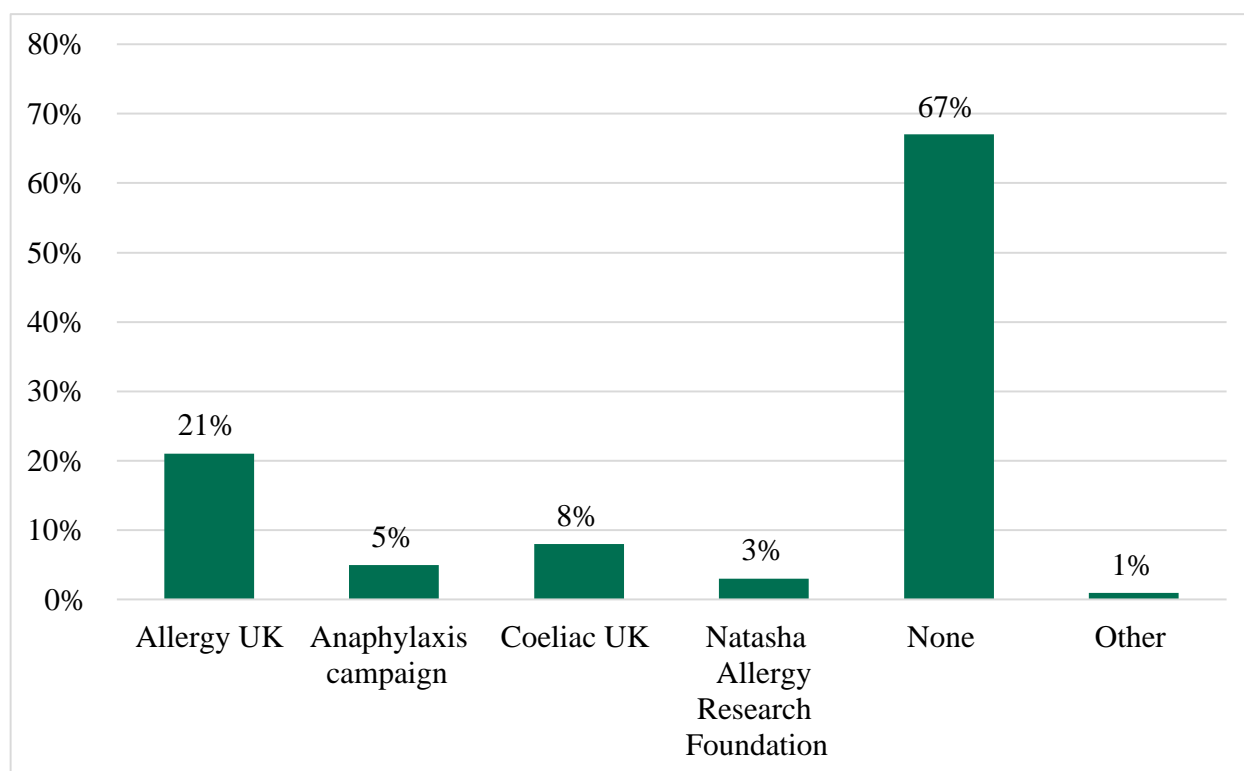
Patient organisation membership

Children were asked to report on whether they were a member of any patient organisations and could choose as many as applied (hence percentages add up to more than 100%). The majority (67%, n = 233) were not members of any organisation (see Figure 54). However, for those who were members of organisations, the most common were Allergy UK (n = 74; 21%) and Coeliac UK (n = 27, 8%). Of those who reported belonging to Allergy UK, 61% (n = 45) were children from the food allergy group.

Reactions to food

Children were first asked to report all foods they experience a bad or unpleasant physical reaction to, and there were no limits on the number of foods that could be reported. Milk (11% of all children reported this as one of the foods they reacted to), cereals (8%), eggs (8%) and peanuts (7%) were the most frequently reported foods. 'Other' foods included meat, pasta, bread, dairy, herbs and spices (for example, ginger), pulses, condiments and sauces (for example, tomato sauce) and pizza. Please see Annex C Table 55 for a full breakdown of foods reported by hypersensitivity.

Figure 56: Membership of patient organisation groups



Base: All children (349)

Foods with an adverse reaction

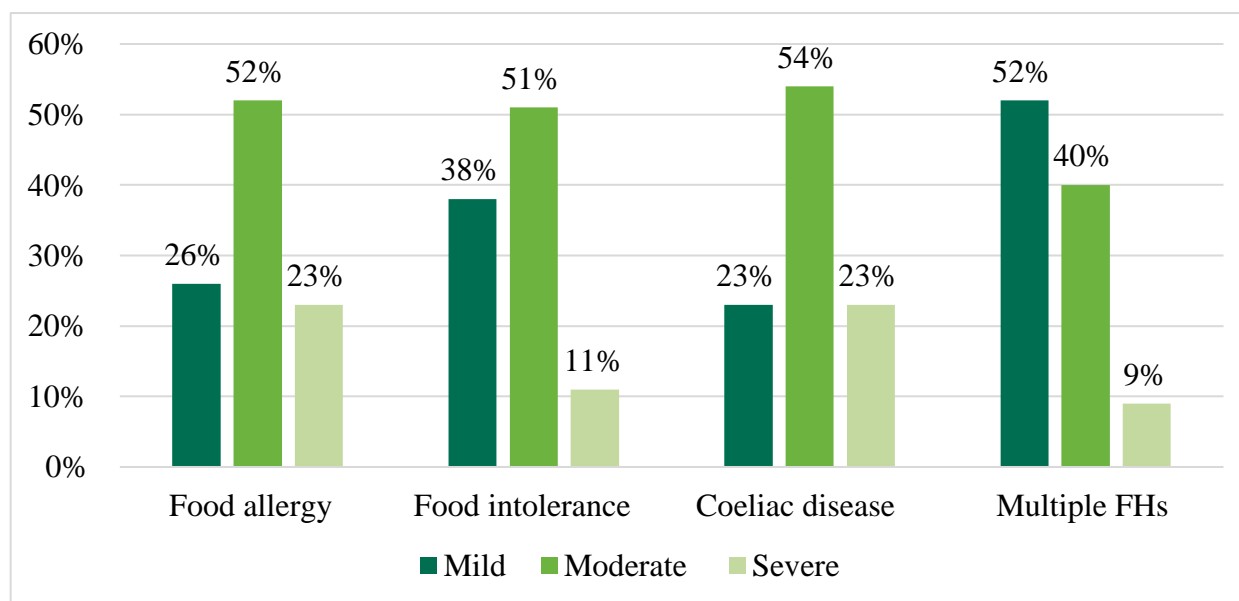
Children were also asked which foods had the most impact on their lives and could report on up to three foods in more detail. The most common number of foods reported was one (n = 349, 79%), with only 59 (13%) children reporting a second food and 32 (7%) reporting three foods. Across all foods reported (n = 440 - note this is not separate types of food but the number of foods reported in total by children), the most common food to result in an adverse reaction was milk (n = 78; 18%). Of those reporting a reaction to milk, 68% were children with food intolerance (n = 53). Peanuts were the most frequently reported food for those with food allergy (n = 45; 28%), tree nuts (n = 20; 13%) and fish (n = 19, 20%). In addition to milk (n = 53, 33%), cereals (n

= 25; 16%) were also commonly reported by children with food intolerance. For a full breakdown of foods by hypersensitivity please see Annex C Table 56.

Children could categorise their reaction for each food they reported as food allergy (n = 182), food intolerance (n = 185), coeliac disease (n = 48), other or don't know (n = 25; not focussed on exclusively in this report).

For 16% (n = 70) of the reactions to food reported, children rated their reaction as severe, 49% (n = 213) rated their reactions as moderate and 35% (n = 152) as mild. Reactions reported by children as food allergy (n = 82; 52%), food intolerance (n = 81; 51%) and coeliac disease (n = 19; 54%) were most commonly rated as moderate and for those with multiple hypersensitivities as mild (n = 30; 52%). However, more reactions reported by children with food allergy (n = 36; 23%) were rated as severe compared to those with other hypersensitivities (Figure 57).

Figure 57: Severity of reaction, by hypersensitivity



Base: All reactions reported by children from hypersensitive groups (411): Food allergy (159); Food intolerance (159); Coeliac disease (35); Multiple hypersensitivities (58).

Symptoms

Across all foods, the most frequently reported symptoms experienced by the participants were gastrointestinal (34%). This was also true for those with food intolerance (52%) and coeliac disease (45%). However, for children with food allergy reactions (30%) and multiple hypersensitivities (26%), the most common symptoms experienced were breathing symptoms; Annex C Tables 57-59).

When asked to report the worst symptoms participants had ever had after eating the foods, the most severe symptoms for reactions experienced by all children (33%) and those reactions to foods reported by children with food intolerance (51%) and coeliac disease (36%), were gastrointestinal. However, for reactions reported by children with food allergy, the most frequently reported severe symptoms were skin symptoms (30%) and for children with multiple hypersensitivities, the most severe symptoms were both breathing and gastrointestinal (26% each; Annex C Table 60).

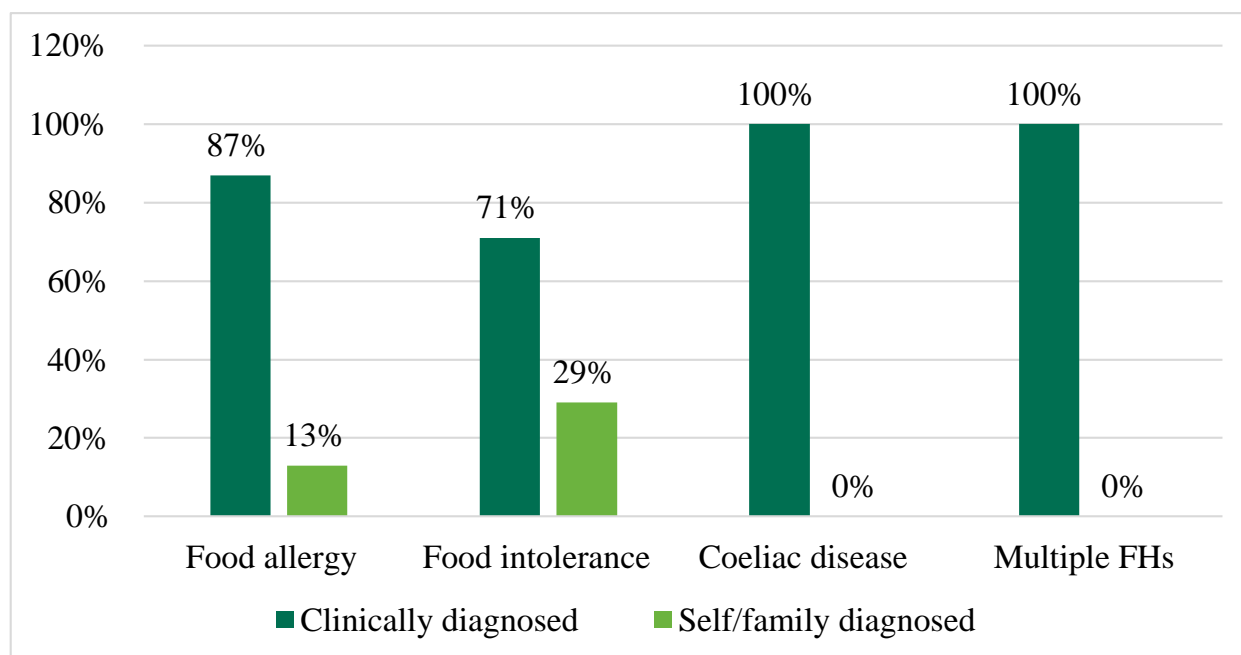
Symptoms for most reactions (n = 178; 41%) started between 5-30 minutes of children consuming their stated food. This was also reflected across the hypersensitivities except for reactions reported by children with coeliac disease, for whom the majority of reactions typically

occurred after 30 minutes of consuming their stated food (n = 20; 58%; Annex C Table 61).

Diagnosis

Children were asked how and who they had been diagnosed by, to determine whether they had been clinically diagnosed or were self-diagnosed. A majority of the sample reported that their reactions to the foods were clinically diagnosed (total n = 349; 83%). Across all hypersensitivities most participants reported their reaction as clinically diagnosed, however children in the food intolerance group also reported that 29% (n = 20) of their reactions have been self or family-diagnosed (Figure 58).

Figure 58: Diagnosis by hypersensitivity

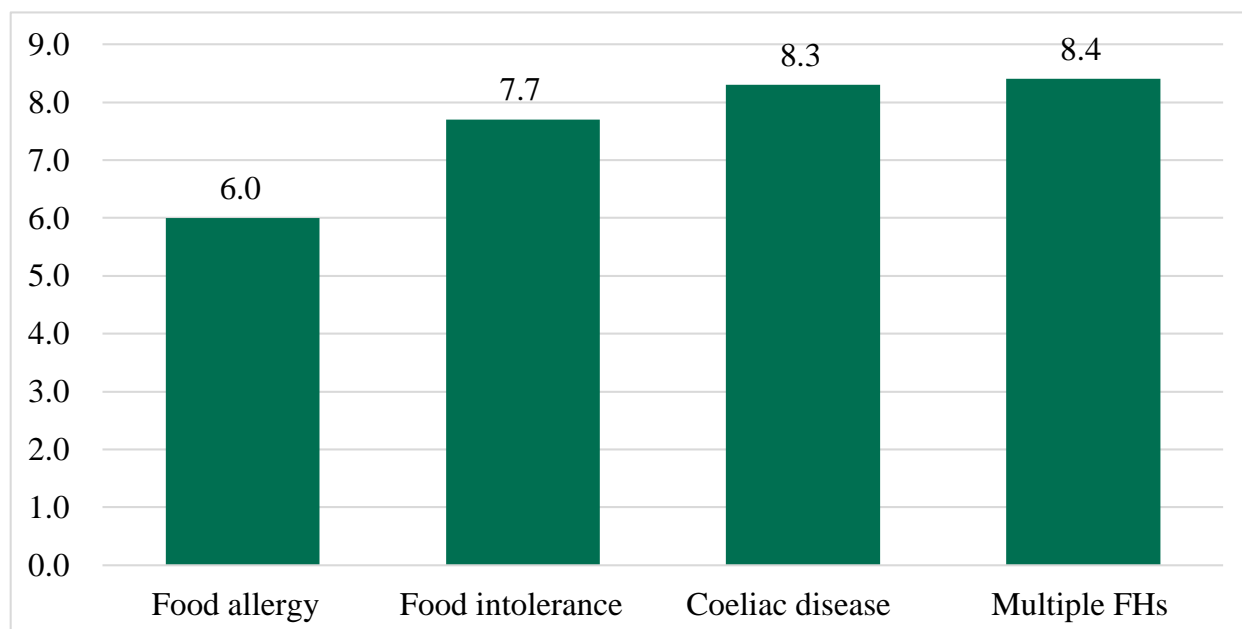


Base: All reactions to food given a diagnosis (378); Food allergy (154); Food intolerance (154); Coeliac disease (34); Multiple hypersensitivities (36)

The majority of all reactions to foods reported were diagnosed by a hospital doctor, nurse or a GP (n = 304, 73%). The most commonly reported diagnosis methods included noticing symptoms themselves (n = 111; 21%), a blood test (n = 86, 16%) and healthcare professional's diagnosis (n = 82, 15%). For 20% (n = 105) of reactions to foods, children reported that they had been informed by their caregiver (this could be in addition to other forms of diagnosis, as participants could choose as many diagnosis methods as they liked; see Annex C Table 62).

For 26% (n = 100) of the reactions reported, children reported always having their adverse reaction to the stated food. However, participants' average age that they remember starting to react to their first food ([footnote 1](#)) was 7.2 years old (SD = 3.8). Those with food allergy (mean = 6.0, SD = 3.4) tended to start reacting to their first food at a significantly younger age than children reporting food intolerance (mean = 7.7, SD = 3.6; p = .004; Figure 59).

Figure 59: Mean age (in years) children with each hypersensitivity were diagnosed for the first food they reported



Base: All children with hypersensitivities (102); Food allergy (80); Food intolerance (65); Coeliac disease (19); Multiple hypersensitivities (9).

About their reaction

While for 17% (n = 72) of all reactions to foods, children reported that they had not reacted to their first food in the previous 12 months, for 79% (n = 341) of reactions children reported that they had had a reaction (4%, n = 16 didn't know). For 21% of all reactions, children reported they had reacted once (n = 88) and for 25% that they had reacted twice (n = 107). Across hypersensitivities, of those with a food allergy who had reacted to their stated food in the previous 12 months, it was most common to have reacted twice (n = 44; 28%); for food intolerance (n = 42; 27%) and coeliac disease (n = 9, 27%) it was most common to have experienced a reaction between 3-6 times. Participants with multiple hypersensitivities reported most commonly reacting once (n = 24, 41%) but 61% with multiple hypersensitivities reported reacting more frequently to foods (for example, 29% had reacted twice, 15% between 3-6 times and 7% 7-10 and more than 10 times; Annex C Table 63).

Children also reported where their stated reaction happened (for example, where they were when they first experienced symptoms of an adverse reaction). For the majority (58%, n = 237), their reactions occurred at home and this was also reflected across the hypersensitivities. However, for children in the multiple hypersensitivities group their reactions also commonly occurred at family and friends' houses (31%, n = 17%) and school (17%, n = 9) as well as at home (28%, n = 15) and work (11%, n = 6; see Annex C, Table 64). However, participants only reported where their reaction occurred and not where they consumed the stated food.

Anaphylaxis

The total number of reactions reported by children who had ever experienced anaphylaxis was 145 (35%), of which 43% (n = 62) were reactions reported by those with food allergy and 31% (n = 45) were reactions reported by those with multiple hypersensitivities (Annex C, Table 66). For experience of anaphylaxis in the last 12 months, the total number of reactions was 98 (24%), with 33% and 36% of these being reported by children with food allergy and multiple hypersensitivities respectively, indicating these groups were most at risk of anaphylaxis in this sample (Annex C, Table 67). However, those with food intolerance (and coeliac disease also reported experience of anaphylaxis, which may indicate that participants may have misunderstood the question or

miscategorised themselves, as this is not common for those with food intolerance or coeliac disease, thus these results should be taken with some caution.

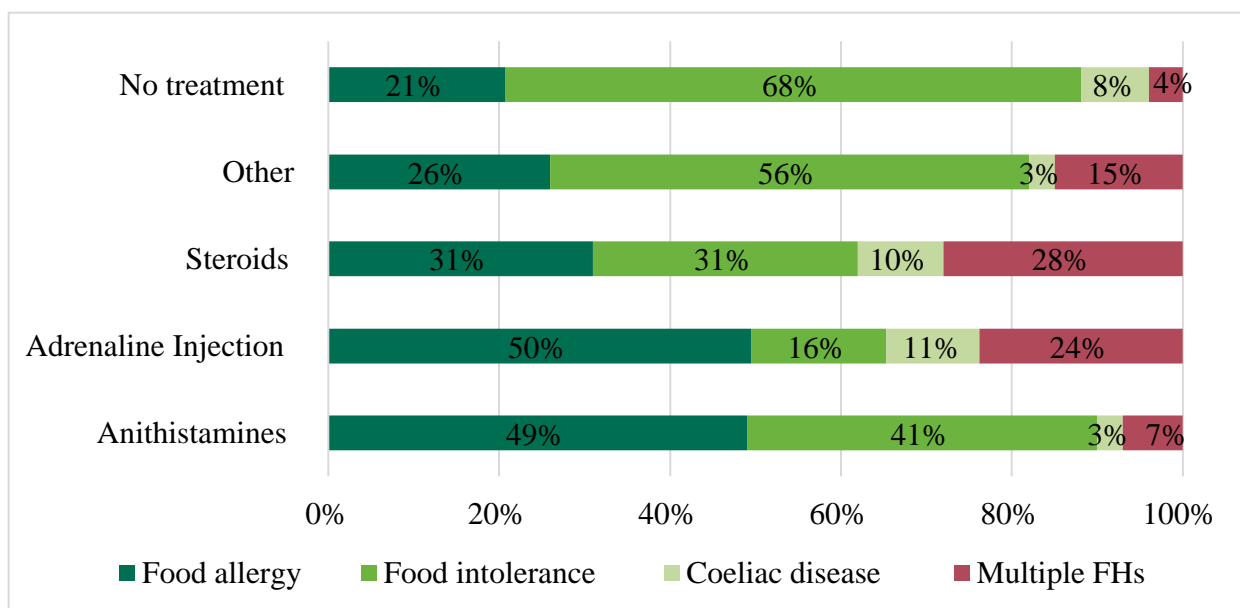
Similarly, 38% (n = 166) of all children had been prescribed an adrenaline auto-injector, of which 45% (n = 74) were participants with food allergy and 30% (n = 50) were children with multiple hypersensitivities. However, 16% (n = 26) of these were also children reporting food intolerance and 7% (n = 11) were children with coeliac disease, again possibly reflecting that participants had either miscategorised themselves or misunderstood the question.

Treatment

Participants were asked about the treatments they had received for the reactions to the food stated, including who treated them for the reaction. The majority of children across all reactions reported treating the reaction themselves (36%, n = 166) or being treated by someone else who was not medical (31%, n = 143). This was also true for those with food intolerance and coeliac disease, however for those with food allergy (31%, n = 51) and multiple hypersensitivities (47%, n = 32) participants also reported being treated by someone medical (Annex C, Table 65).

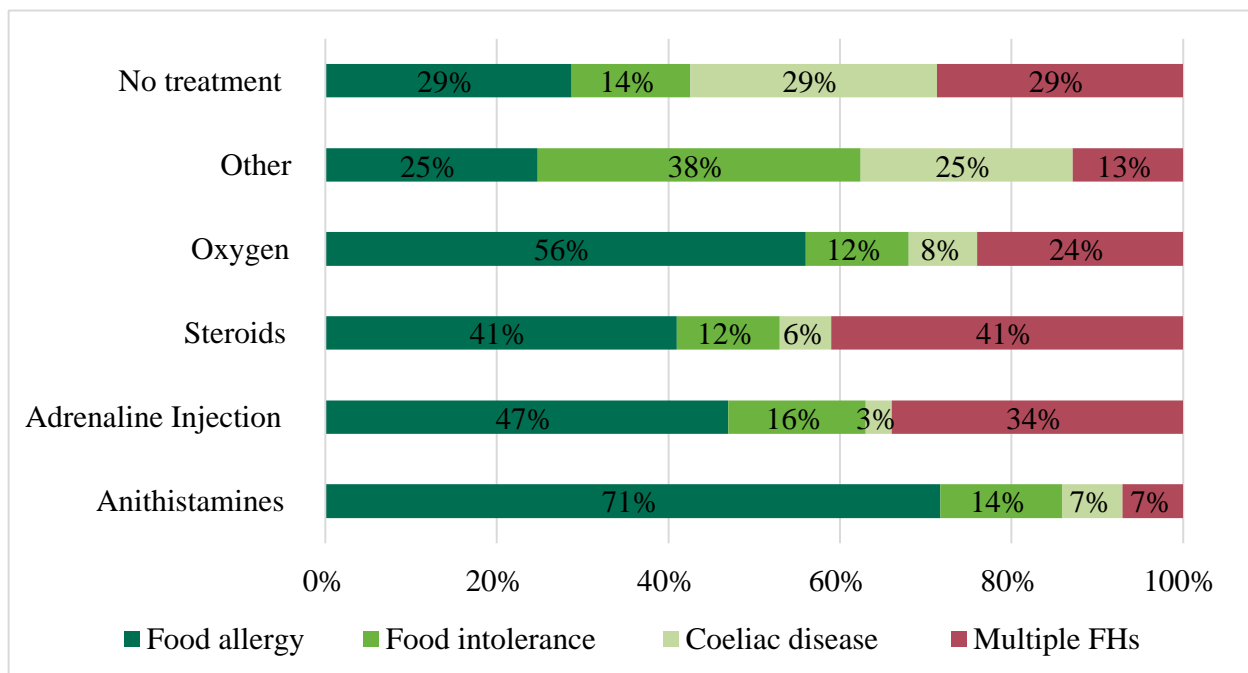
For treatments administered by a non-medical person, antihistamines were the most common treatment reported (n = 110; 35%), although 28% also reported not taking anything (see Figure 60). For treatments administered by a medical professional, the most common treatment was adrenaline injection (27%, n = 38), as well as steroids (24%, n = 34). For both those given by a non-medical professional, as well as a medical professional, treatments were most commonly given for reactions reported by children with food allergy (see Figures 60 and 61).

Figure 60: Treatments given by non medical person for all foods



Base: All treatments for children with hypersensitivities (297); Food allergy (109); Food intolerance (134); Coeliac disease (18); Multiple hypersensitivities (36)

Figure 61: Treatments given by medical professionals for all foods



Base: All treatments for children with hypersensitivities (140); Food allergy (70); Food intolerance (21); Coeliac disease (11); Multiple hypersensitivities (38).

Hospital admission

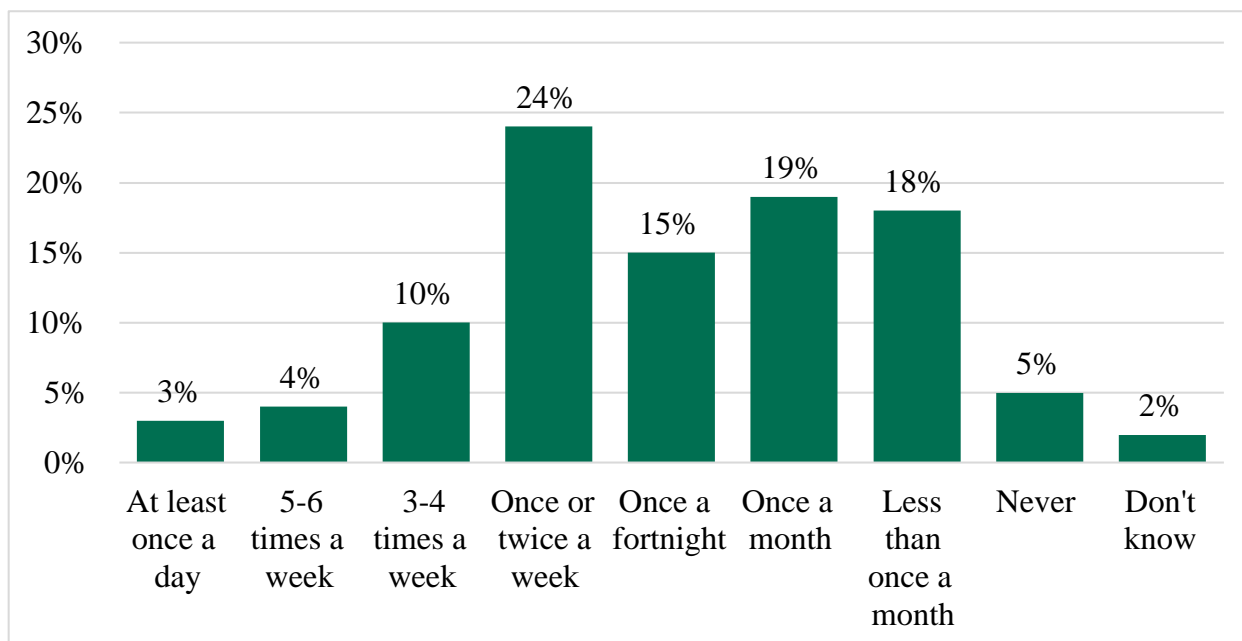
For 69% (n = 289) of the adverse reactions to foods reported, children had never had an ambulance called, and for 64% (n = 264) of reactions, children had never been admitted to hospital. For those that had been admitted to hospital (n = 149, 36% of all foods reported), 120 (81% of those who had been to hospital) were admitted the first time that they reacted. It was most common for children to report being admitted to hospital once (n = 44; 30%) or not to have been admitted in the last 12 months (n = 33; 23%). Across hypersensitivities, the group with the highest percentage of being admitted to hospital was children with food allergy (n = 61; 41% of all those being admitted), with 82% (n = 50) of these going the first time that they reacted. While 37% of children with food allergy had not been admitted in the last 12 months, 31% (n = 18) had been admitted once, as had 26% of children with food intolerance, 30% of children with coeliac disease and 29% of children with multiple hypersensitivities who had ever been admitted to hospital for their reaction (see Annex C, Tables 68 and 69).

Eating out

Participants were asked how often they eat out, and how comfortable they feel with various aspects of eating out, such as asking for information from a member of staff.

Children most frequently reported eating out between once or twice a week and less than once a month (n = 258; 76% of all children; Figure 62).

Figure 62: How often participants eat out or get food to take away



Base: All children (338).

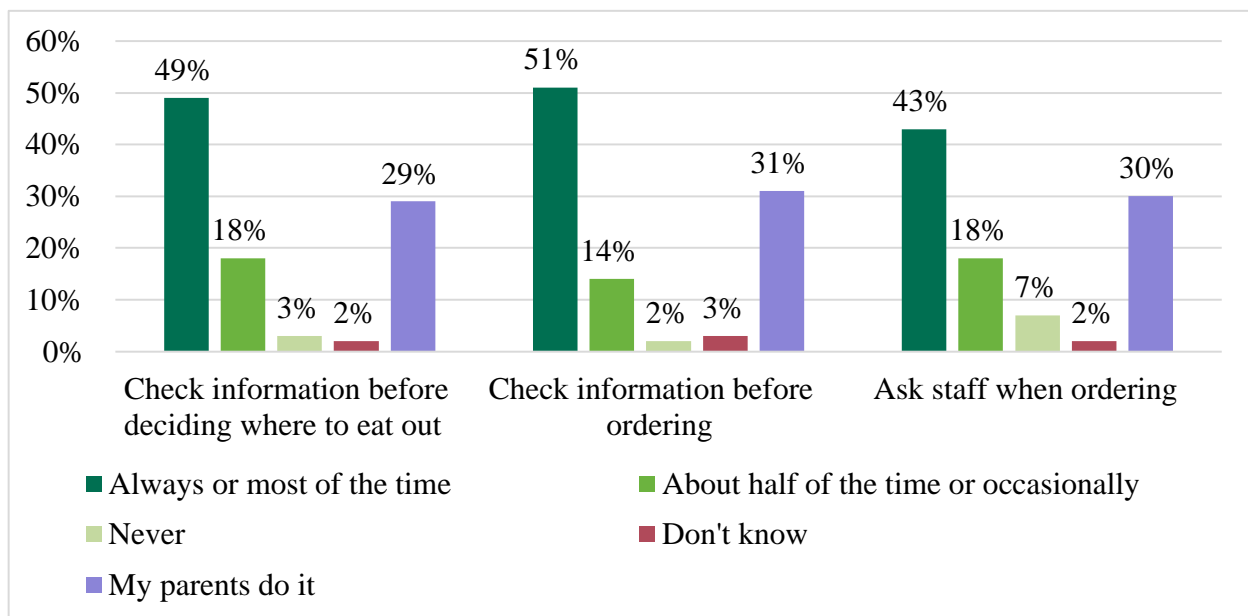
Across the hypersensitivities, child participants with food allergy most commonly ate out once or twice a week ($n = 36$; 26%), those with food intolerance ($n = 35$; 26%) most commonly ate out once a month, those with coeliac disease most commonly ate out once or twice a week or once a fortnight ($n = 8$, 27% each) and those with multiple hypersensitivities most commonly ate out 3-4 times a week ($n = 6$, 32%), indicating that those with food intolerance ate out less than children with other hypersensitivities. However, there were no significant differences in how often children with different hypersensitivities eat out, with both groups (food allergy and intolerance) on average eating out around once a month or fortnight ($p = .13$). See Annex C Table 70.

Checking information when eating out

Children were asked how often they checked that there is information available that will allow them to identify foods that cause a bad or unpleasant physical reaction before deciding where to eat. They were also asked how often they review the available information, and how often they ask staff for information before ordering food.

Most children reported that they almost always reviewed information at each stage of eating out, but for many children, their caregiver was responsible for this (around 30% at each stage; see Figure 63).

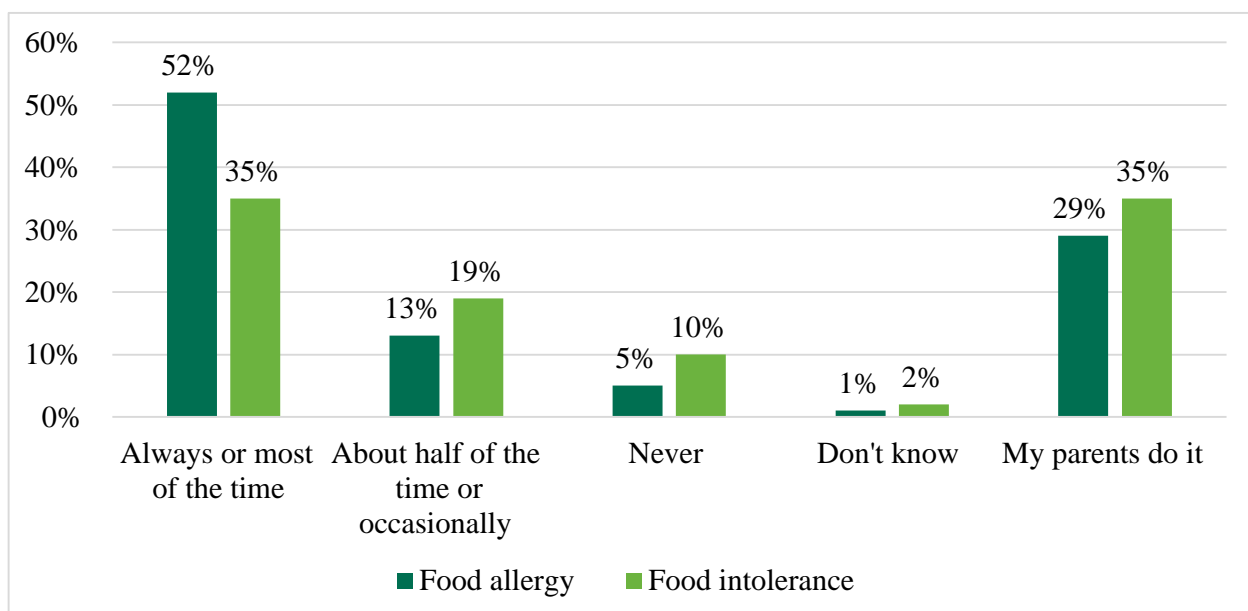
Figure 63: How often children review information when eating out



Base: All children; Check information before choosing where to eat out (321); Check information when ordering (317); Ask staff when ordering (315).

There were no significant differences in how often children with food allergy and food intolerance checked information was available before choosing where to eat out or reviewed available information before ordering food (both $ps > .05$). However, there were significant differences for how often children ask members of staff for information about foods that may cause an adverse reaction, $t(150.9) = 2.61, p = .01$. Children with food allergy (mean = 3.9, SD = 1.2) asked for information significantly more often than children with food intolerance (mean = 3.4, SD = 1.5), on average reporting they asked for this most of the time (Figure 64).

Figure 64: How often children ask staff for information when eating out, by hypersensitivity



Base: Children with hypersensitivities; Food allergy (129); Food intolerance (124).

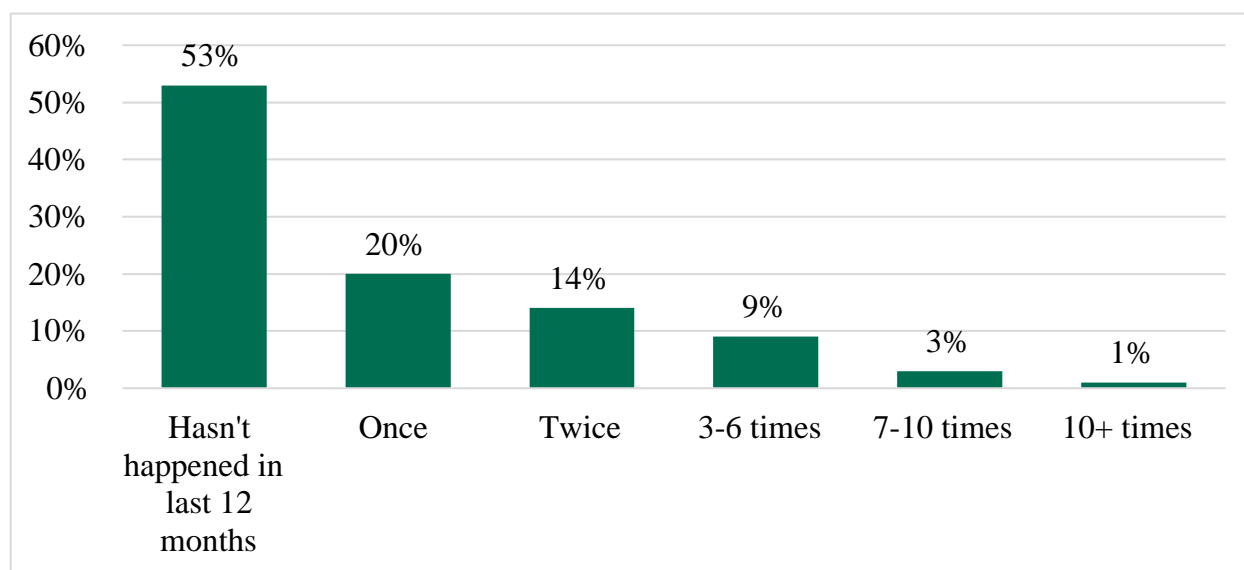
Participants were also asked how comfortable they felt asking a member of staff for information about food when eating out, because of a concern about experiencing a bad or unpleasant

physical reaction. They were also asked how confident they were in the information provided when eating out. The majority of children reported being comfortable in asking staff for information (n = 179; 56% were very or fairly comfortable) and were confident in written (n = 198; 63% were very or fairly confident) and verbal information provided when eating out (n = 188; 59%). This was also true across hypersensitivities (Annex C Tables 71-73).

However on a scale from 1 (Not at all) to 4 (Very comfortable), children with food allergy (mean = 3.0, SD = 0.9) reported being significantly more comfortable asking for available information than those with food intolerance (mean = 2.7, SD = 0.9, $t(212) = 1.98$, $p = .049$). Further, there were significant differences for how confident children were in verbal information provided by staff when eating out, with children with food allergy (mean = 3.0, SD = 0.9) being more confident in this than those with food intolerance (mean = 2.6, SD 0.8; $t(207) = 2.58$, $p = .01$). There were no significant differences observed by food hypersensitivity for confidence in written information ($p > .05$).

Participants also reported how often they had been offered a food which may cause a bad or unpleasant reaction in the last 12 months, when eating out, despite checking available information. For the majority, this hadn't happened (n = 169, 53%) but for those who had been offered a food which may cause an adverse reaction in the past 12 months, despite checking available information (n = 150; 47%), this was most likely to have happened once (n = 65, 20%; see Figure 65 and Annex C Table 74). This was the same across hypersensitivities, except for children in the multiple hypersensitivities group who reported that they had most frequently experienced being offered food which may cause an adverse reaction twice (n = 8; 44%).

Figure 65: How often children have been offered an allergen in the last 12 months



Base all children (319).

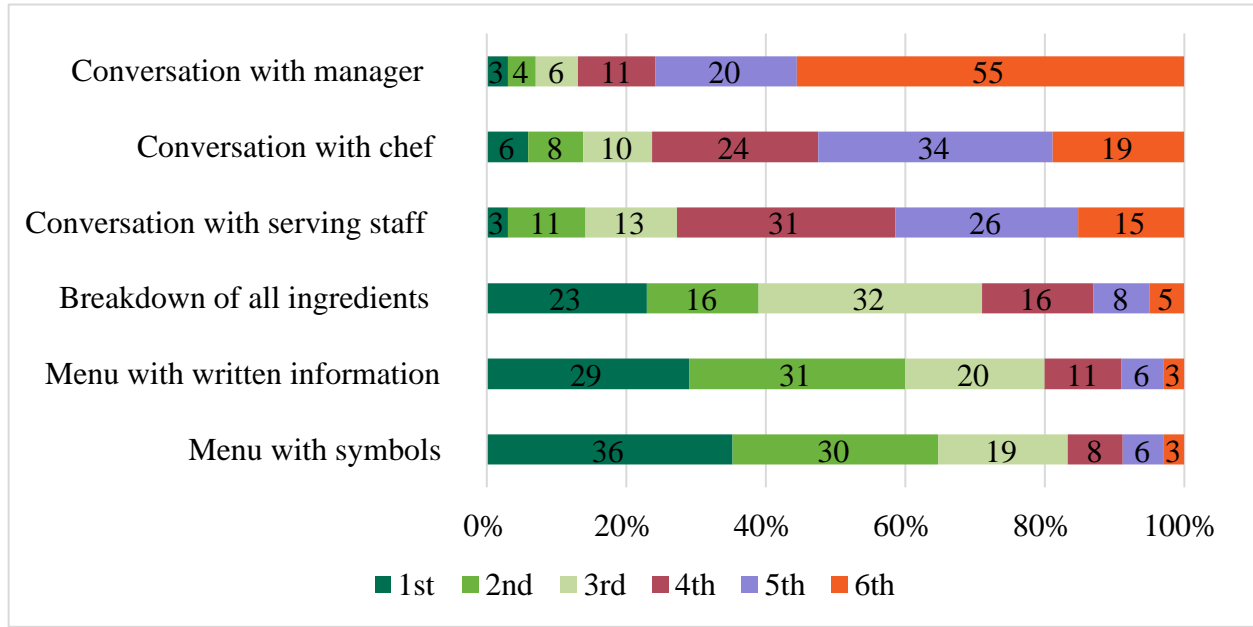
When reporting the sources of information they found most useful when checking available information allergen information when eating out, children rated menus with symbols indicating allergens in each dish as most useful (n = 113, 36% rated this as their most useful source of information). The second most helpful was menus with written allergen information (n = 97, 31%) and the third most helpful was a breakdown of all ingredients in a dish on menus (n = 102, 32%; see Figure 66).

This was also true across hypersensitivities with children with food allergy and multiple hypersensitivities rating the menus with symbols indicating allergens and written information on menus as equally useful. However, children with food intolerance rated menus with written

allergen information (n = 40, 31%) as most helpful and menus with symbols indicating allergens as second helpful (n = 44, 35%).

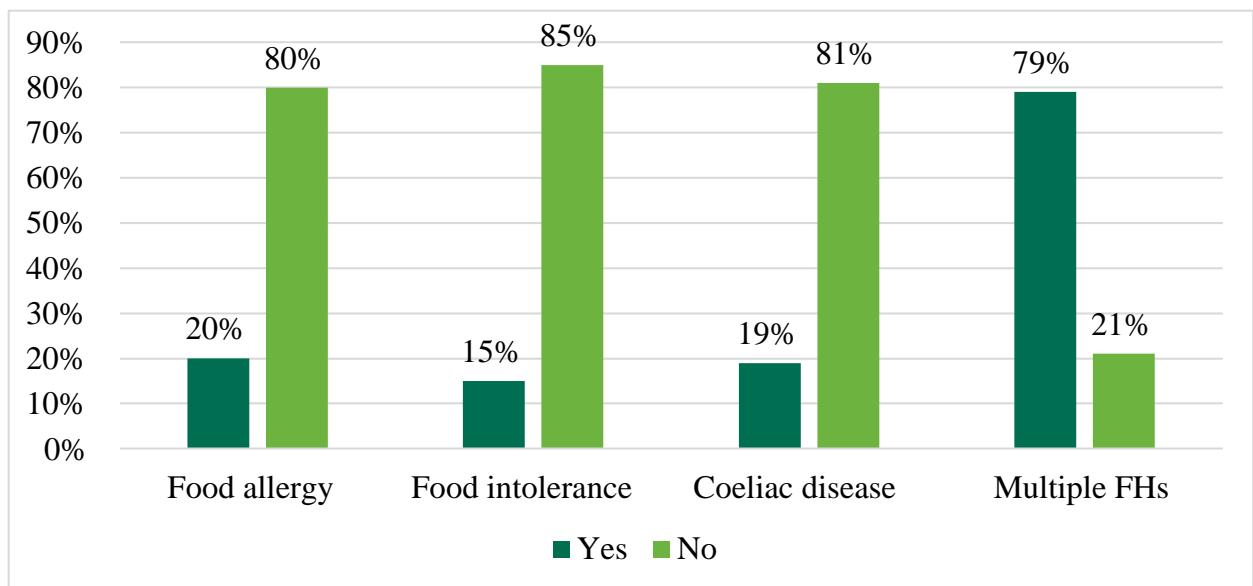
More than one in five (n = 71; 22%) of children reported they had been refused service because of their hypersensitivity (n = 257; 78% had not). Although within those who had multiple hypersensitivities the majority reported having been refused service (n = 15, 79%), of those who had been refused service, children with food allergy (n = 26; 40%) were significantly more likely to report having been refused service than those with other hypersensitivities, $\chi^2(3) = 41.97, p < .001$, reflecting the larger sample size of children with food allergy (Figure 67).

Figure 66: Rank of most useful sources of information for children, when eating out



Base: All children (318)

Figure 67: Proportion of children refused services when eating out because of their reaction to food



Base: All children (309); Food allergy (132); Food intolerance (131); Coeliac disease (27); Multiple hypersensitivities (19).

Quality of Life

Food hypersensitivity specific quality of life

Participants were asked to complete a health-related quality of life scale appropriate to the type of self-reported food hypersensitivity they reported for their first food. Those reporting a food allergy completed the Food Allergy Quality of Life Questionnaire (FAQLQ child or teen version), those reporting food intolerance completed Food Intolerance Quality of Life Questionnaire (FIQLQ child or teen version), and those reporting Coeliac Disease completed the CDDUX (a specific questionnaire for children of all ages with coeliac disease).

Children reporting multiple hypersensitivities completed the questionnaire appropriate to the first food they reported (for example, if someone reported food allergy to their first food, intolerance to their second and third, they completed the FAQLQ). However, due to small numbers, results for those completing the CDDUX and those with multiple hypersensitivities are not reported here.

Quality of life in all children

The FAQLQ and FIQLQ are rated on a scale from 1 (least impact on quality of life) to 7 (most impact on quality of life). On both scales, the means were used (mean for each scale = 4, and reflects selected choice 'moderately'), with high scores (closer to 7) indicating more impact upon quality of life. Children of different age groups completed age-appropriate scales. On average, teens and children with food allergy reported a mean of 4.3 out of 7, and teens and children with food intolerance reported a mean of 4.2 out of 7, indicating that both groups felt that their food allergy or intolerance impacted their quality of life 'moderately' to 'quite a bit' (Table 3).

Table 3: Mean Quality of Life for each FH-specific scale, by age group

Respondent group	FAQLQ (Food allergy) N = 131	FIQLQ (Food intolerance) N = 139
All children Mean total (SD)	4.3 (1.4)	4.2 (1.4)
8-12s Mean total (SD)	4.0 (1.5)	4.2 (1.4)
13-17s Mean Total (SD)	4.7 (1.3)	4.2 (1.4)
Out of a possible total of:	7	7

Quality of Life in children reporting allergy

The FAQLQ is comprised of the following sub-scales: Allergen Avoidance and Dietary Restrictions (AADR), relating to the impact of dietary and social limitations and allergy awareness behaviours (for example, checking whether you can eat something) to avoid an allergic reaction; Emotional Impact (EI), relating to the worries and concerns of having food allergy and of an allergic reaction; and Risk of Accidental Exposure (RAE), relating to the need for awareness of allergens in social situations and on packaging.

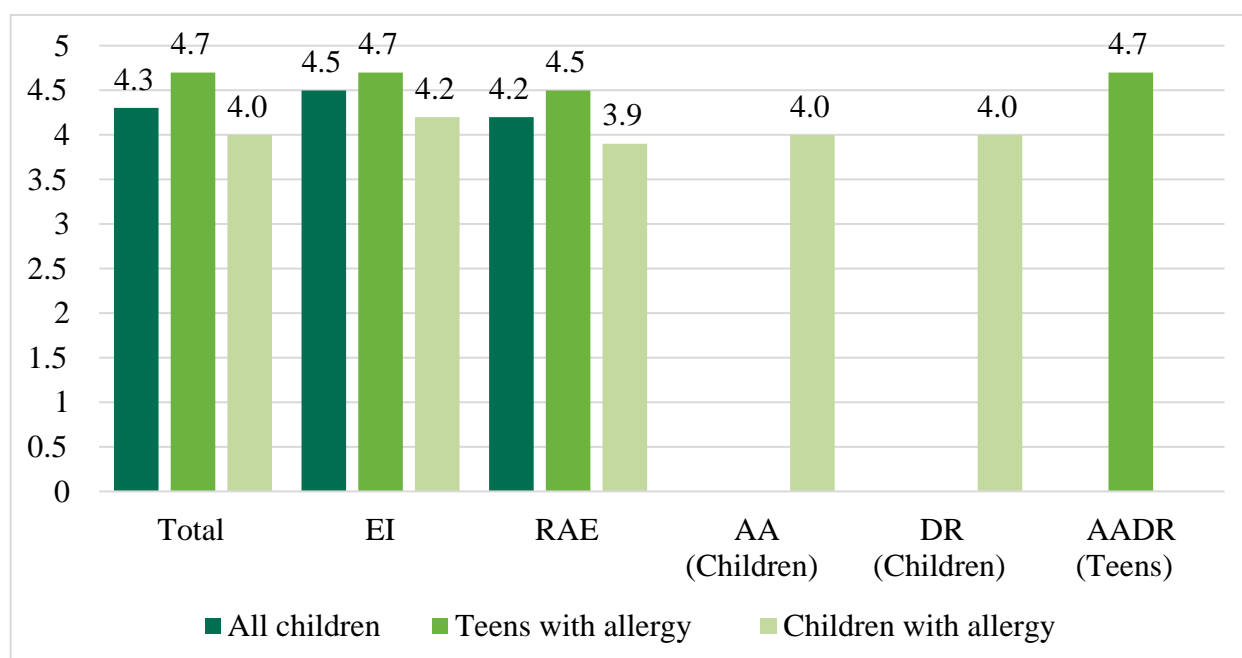
For each age group a different age-appropriate version of the FAQLQ was completed. Those aged 13-17 years completed the teen version and those aged 8-12 years completed the child version, which has separated Allergen Avoidance and Dietary Restrictions subscales. A total of 131 children completed the FAQLQ, of which 128 were from the allergy only group (and 3 with multiple hypersensitivities however these will not be reported on). Of those who completed the FAQLQ, 68 were from the 13-17 sample and 63 were from the 8-12 sample.

The impact on quality of life for all children (both age groups) with food allergy was above average (mean total = 4.3 out of 7, SD = 1.4), indicating quality of life was impacted 'moderately'. However, the total and subscale scores for teens were higher than those reported by children

(see Figure 68), with the subscales for emotional impact (4.7 out of 7, reflecting choices 'moderate' impact or 'quite a bit' SD = 1.4) and allergen avoidance and dietary restrictions (mean = 4.7 out of 7 reflecting choices 'moderate' impact to 'quite a bit', SD = 1.3) reflecting that the worries and concerns around having food allergy and the restrictions and allergy awareness behaviours associated with it were the areas which had the most impact on teenagers' quality of life. For children, the score on the emotional impact subscale (mean = 4.2 out of 7, SD = 1.7) was highest, indicating that worries and concerns around having food allergy had the most and 'moderate' impact on quality of life for younger children (Figure 68).

Differences in clinical factors for younger childrens' and teenagers' FAQLQ scores were not examined as subgroups were too small. However, reported severity of younger childrens' reactions ($r = .31, p = .02$) and teenagers' reactions ($r = .57, p < .001$), were significantly positively correlated with impairment to children's quality of life. Frequency of eating out ($r = -.31, p = .03$) and confidence in verbal information when eating out ($r = -.46, p = .002$) were both significantly negatively correlated with impairment to younger children's quality of life. However, frequency of reviewing information before ordering food when eating out ($r = .39, p = .02$) and asking staff for available information when eating out ($r = .44, p = .004$) were significantly positively correlated with impaired quality of life in teenagers with food allergy.

Figure 68: Mean FAQLQ scores for children reporting food allergy



Base: All children completing the FAQLQ in the food allergy only group (128); Teens (13-17s; 68); Children (8-12s; 63).

A regression model was run for both younger children and older children to see which of the variables described above might predict impairment to quality of life. For younger children, the variables above which had a significant association with quality of life were included in the model ($n = 3$ predictors). The overall model was significant ($p = .02$) and 24% of the variance in quality of life was explained, indicating that 76% of the variance was due to other unknown factors. Confidence in verbal information was the only significant predictor of quality of life, indicating that greater confidence predicted lower impairment to younger children's quality of life (standardised beta = -0.42). None of the other predictors were significant (standardised betas were -0.06 and 0.16, and confidence intervals for each predictor crossed zero).

For older children (teenagers), the three significant variables above were entered into the model to see which predicted impairment to quality of life. The overall model was significant ($p < .001$) and 42% of the variance in quality of life was explained, indicating that 58% of the variance was due to other unknown factors. Only self-reported severity of reaction was a significant predictor of impairment to quality of life, indicating that greater severity predicted more impairment to teenager's quality of life (standardised beta = 0.51). None of the other predictors were significant (standardised betas were 0.10 and 0.24 and confidence intervals for each predictor crossed zero).

Quality of Life in children reporting food intolerance

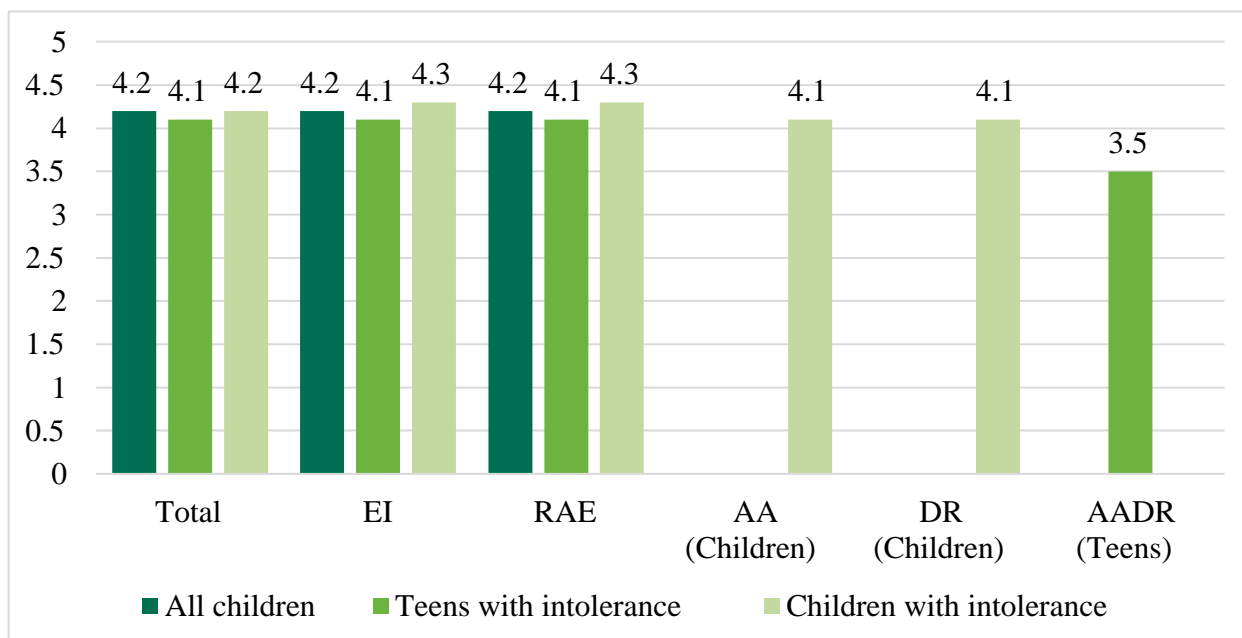
For the FIQLQ, the subscales comprise of: Allergen Avoidance and Dietary Restrictions (AADR) relating to impact of the social and dietary limitations of having food intolerance; Emotional Impact (EI) relating to the worries and concerns about having food intolerance and an adverse reaction, and Risk of Accidental Exposure (RAE) relating to the impact of the need to check whether foods are suitable to eat in order to avoid an adverse reaction. As with the FAQLQ, two different scales were used for younger (8-12 years) and older children (13-17 years). A total of 130 children from the food intolerance only group completed the FIQLQ (a further 9 were from the multiple hypersensitivities group). Seventy one of the 8-12 sample, and 59 of the 13-17 sample completed the FIQLQ.

Children (aged 8-17 years) with food intolerance reported 'moderate' quality of life (mean = 4.2 out of 7, SD = 1.4) with scores across the subscales for both teens and children reflecting this (see Figure 66). Younger children reported slightly higher scores and more impact on quality of life across subscales, especially for the emotional impact subscale (mean = 4.3 out of 7, SD = 1.5) and risk of accidental exposure subscales, indicating that the worries and concerns experienced by children with food intolerance and the need to check foods to avoid a reaction has the most and 'moderate' impact on their quality of life.

For 13-17 year-olds scores indicated that food intolerance had a moderate impact on quality of life across the subscales, except for the AADR subscale, which teens reported an average of 3.5 out of 7 (SD = 1.3), indicating that the social and dietary limitations and need to be aware of foods as a result of having food intolerance 'slightly' affected quality of life and had the least impact on their quality of life. On average, children with food intolerance tended to have slightly better average QoL than those with food allergy (see Figure 69).

For children and teenagers with food intolerance, the severity of their reaction was significantly positively correlated with impairment to their quality of life for both younger children ($r = .32$, $p = .02$) and teenagers ($r = .40$, $p = .003$). Further, frequency of checking available information when choosing where to eat out was also significantly positively correlated with impairment to childrens' ($r = .48$, $p = .004$) and teenagers' ($r = .41$, $p = .01$) quality of life. For younger children, how comfortable they were in asking staff for available information when eating out ($r = .37$, $p = .02$), and for teenagers' frequency of checking available information before ordering ($r = .45$, $p = .004$) when eating out were both significantly positively correlated with impairment to quality of life.

Figure 69: Mean FIQLQ scores for children with food intolerance



Base: All children completing the FIQLQ in the food intolerance only group (130); Teens with intolerance (13-17s; 59); Children with intolerance (8-12s; 71).

A regression model was run for both younger and older children to see which of the variables described above might predict level of quality of life. For younger children (aged 8 -12), the variables above which had a significant association with quality of life were included in the model (n=3 predictors). The overall model was significant ($p=0.02$) and 31% of the variance in quality of life was explained, indicating that 69% of the variance was due to other unknown factors. Higher frequency of checking available information before choosing where to eat out significantly predicted more impairment to quality of life (standardised beta 0.36). None of the other predictors were significant (standardised betas ranged from 0.13 and 0.34 and confidence intervals for each predictor crossed zero).

For older children (aged 13-17), the three significant variables above were also entered into the model. The overall model was significant ($p < 0.05$) and explained 25% of the variance in impairment to quality of life, indicating that 75% of the variance was due to unknown factors. However, none of the predictors were significant in predicting impairment to quality of life (all standardised betas ranged from 0.11 to 0.31 and confidence intervals for each predictor crossed zero).

Differences in Quality of Life by hypersensitivity

For these key comparisons, data for children and teenagers was combined, to ensure numbers in subgroups were sufficient to carry out the analysis. Comparisons in QoL scores were made for gender of those reporting hypersensitivities, age group (8-12s vs 13-17s) and severity of reaction. Comparisons were made where numbers allowed for this. Where more than two groups are compared, a Bonferroni correction has been applied to the significance level of 0.05 (/3 in all cases), thus a new level of .016 was used for more than two comparisons.

Food allergy only

Of the food allergy only group, 102 children completed all questions of the FAQLQ.

Gender

For children reporting food allergy only, 53 males and 36 females completed the FAQLQ (as well as 2 who identified 'in another way' and 1 who preferred not to say, however these were excluded for these analyses only). There were no significant difference in the impact of food allergy upon quality of life between males (mean = 4.5, SD = 1.5) and females (mean = 4.1, SD = 1.3) with food allergy, $t(97) = 1.23$, $p = .22$.

Age

Of the children completing the FAQLQ, 54 were younger children (8-12) and 48 were older children (13-17). Older children reported significantly more impact upon quality of life (mean = 4.7, SD = 1.3), compared to younger children (mean = 4.0, SD = 1.5) $t(100) = 2.39$, $p = .02$.

Severity

There were significant differences in impact on quality of life according to the self-reported severity of reaction, $F(2) = 11.1$, $p < .001$, $\eta^2 = .18$. Participants reporting a severe reaction to their first food ($n = 25$, mean = 5.3, SD = 1.2) reported significantly more impact upon quality of life than those reporting a mild reaction, ($n = 23$, mean = 3.5, SD = 1.1), $t(46) = 5.25$, $p < .001$ and a moderate reaction ($n = 54$, mean = 4.3, SD = 1.4, $t(77) = 3.15$, $p = .002$). However, the numbers of those in the mild and severe groups were small and so these results should be taken with some caution.

Food intolerance only

Of the food intolerance only group, 106 children completed all questions of the FIQLQ.

Gender

Of those children with food intolerance who completed the FIQLQ, 54 were male, 52 were female. Females (mean = 4.4, SD = 1.4) reported significantly higher impairment to quality of life than males (mean = 3.9, SD = 1.3), $t(104) = 2.01$, $p = .047$.

Age

Of those who completed the FIQLQ, 52 children were aged 8-12 years, and 54 were aged 13-17 years. There were no significant differences in QoL scores between younger children (mean = 4.2, SD = 1.3) and older children (mean = 4.1, SD = 1.4), $t(104) = 0.27$, $p = .79$.

Severity

As the numbers of those reporting a severe reaction were too small ($n = 13$) comparisons were only made for mild ($n = 33$) and moderate ($n = 60$) reactions. Those reporting moderate reactions (mean = 4.2, SD = 1.3) had significantly more impact upon quality of life than those reporting mild reactions (mean = 3.6, SD = 1.3), $t(91) = 2.13$, $p = .04$.

Coeliac disease only

For those in the coeliac group, 28 completed the CDDUX, however this was deemed too small a group to conduct sub-analysis on.

Multiple hypersensitivities

For children with multiple hypersensitivities, only 3 completed the FAQLQ, 9 completed the FIQLQ and 4 completed the CDDUX, thus this group was too small to make comparisons for.

Generic quality of life

Children with food hypersensitivity

Children aged 8-12 years completed the EQ-5D-3L. The mean quality of life scores on the VAS were similar for children with food allergy (n = 51, mean = 83.27, SD = 16.47), and those with food intolerance (n = 70, mean score = 82.03, SD = 16.59). Those with coeliac disease scored lower (n = 10, mean = 75.60, SD = 20.46), but numbers in this group are low and so results should be interpreted with caution. On the EQ-5D-3L sub-domains, Pain and Anxiety dimensions are markedly worse for the 8-12-year olds, than the other EQ5D dimensions. For each dimension scores for wave 2 were worse than scores for wave 1, indicating poorer QoL.

Teens with food hypersensitivity

Children aged 13-17 years completed the EQ-5D-5L. The mean quality of life scores on the VAS were highest for teenagers with food allergy (n = 80, mean = 80.00, SD = 19.4), followed by those with food intolerance (n = 61, mean = 77.10, SD = 21.20) and those with coeliac disease who scored lowest (n = 19, mean score = 70.10, SD = 16.30). Numbers for coeliac disease are low and so results for this group should be interpreted with caution. On the EQ-5D-5L sub-domains, Pain and Anxiety dimensions are markedly worse for the 13-17-year olds, than the other EQ5D dimensions. For each dimension scores for wave 2 were worse than scores for wave 1, indicating poorer QoL.

No other comparisons have been made between wave 1 and 2 for children and teens as numbers are too low for meaningful analysis.

1. Comparisons were not made for foods two and three, due to small numbers in these groups

Food Sensitive Study: Conclusions

This survey was completed by over 2,000 people with FH from all regions of the UK. Similar to wave 1, a wide variety of foods were reported as causing an unpleasant reaction which included the 14 allergens which are required by law to be listed as ingredients, with foods containing gluten, milk, tree nuts and peanuts reported most often. Similarly, participants reported a range of symptoms, from gastrointestinal, skin reactions, breathing difficulties, swelling and anaphylaxis. Participants with clinically diagnosed as well as self-diagnosed FHs answered a range of questions about their reactions to food, including their behaviour when eating out and their quality of life.

Eating out

Participants were asked to report how often they ate out and how comfortable they were with various aspects of this activity, such as asking staff for information because of a concern about experiencing an adverse or unpleasant physical reaction. The findings from wave 2 are very

similar to wave 1. Across adults, parents and children, the majority reported that they check or review information at each stage of eating out (such as before choosing where to eat, and before ordering) to enable them to identify foods that may cause an unpleasant reaction, with some differences across types of food hypersensitivity. Similar proportions (over 50%) of adults, children with FH and parents of children with FH reported they felt comfortable asking a member of staff for information because of a concern about experiencing an unpleasant physical reaction and were confident in written information provided about allergens. This is encouraging data for children who need to learn to manage their FH as they grow older and become more independent of their parents.

Despite feeling comfortable asking staff about FH concerns, adults and parents reported being more confident in written information provided by staff when eating out, compared to information provided verbally. However for those adults who completed both waves, confidence in written information was less in wave 2 compared to wave 1. It is unclear why this difference might be.

Legislation for pre-packed food for direct sale came into law in October 2021 when the second survey was launched, meaning that full ingredient labelling was needed, but this may not have had much impact on consumers in the short time the surveys were live. The worldwide Covid pandemic and the UK leaving the EU disrupted supply chains and substitutions to foods may have increased the use of precautionary allergen labelling, which may have contributed to this. Around a fifth of parent and child respondents and a third of adult respondents reported previously being refused service or having been asked to sign a disclaimer. It may therefore be important to investigate the ability and confidence in waiting staff in restaurants to provide suitable information for people with FH.

There were no other differences in eating out between wave 1 and wave 2 apart from an increase in the frequency with which parents reported eating out. This is unsurprising given the lifting of many Covid-19 restrictions between the times wave 1 and wave 2 data were collected.

Quality of life

Participants were asked to complete a health-related quality of life scale appropriate to the type of self-reported FH they reported for their first food and a generic health related quality of life scale. All participants reported that their FH or their child's FH impacted their lives by 'quite a bit' or 'very much'. A number of clinical factors were related to quality of life. In particular, markers of FH severity were related to poorer quality of life across many of the groups, such as having another atopic condition (for example, asthma or eczema), being prescribed an adrenaline auto-injector, having experienced anaphylaxis, being admitted to hospital, the number of foods they react to and self-reported severity.

Self-reported or parental reported severity of FH for teens was related to the level of quality of life as measured by the FH specific validated QoL scales. In the regression models severity also significantly predicted QoL for adults with food allergy or intolerance and for teens with food allergy. The relationship between self-reported severity and QoL ratings is similar to that found in wave 1 and has been reported in previous studies in parents of children with peanut allergy (Acaster et al., 2020a, 2020b). Asking about severity may be a good indicator of the impact of FH, particularly for food allergy, which can be completed very quickly by individuals and families. FH specific QoL was also related to eating out activities in meaningful ways. Being able to eat out more frequently was related to better FH specific QoL. Being more comfortable asking staff for information about food, and higher confidence in the verbal or written information provided about food when eating out, were also related to better FH specific quality of life. However, a greater frequency with which participants had to check information at various stages of eating out was related to poorer FH specific QoL. As noted in the report for wave 1, checking behaviour may create a greater burden on the individual or parent, which has an impact on QoL.

In regression models for adults, more frequent checking of information when eating out and frequency of asking staff for information significantly predicted poorer QoL. Similarly for 8-12 year olds more frequent checking of information when eating out significantly predicted poorer QoL (see Table 75 in the Annex for a summary of the significant predictors found for the regression models). For many of the parent and child models, a good proportion of variance in quality of life was explained, but few or no individual predictors were significant. As noted for the results from wave 1, this may be due to multicollinearity in the data, with predictor variables correlating with each other. Further analysis should take this into account and control for the variance explained by clinical variables before entering variables related to eating out and reading of labels.

Adults, parents of children and children themselves with food allergy reported better generic quality of life than those with food intolerance or coeliac disease and those with multiple FHs often scored poorest. This was also reported in wave 1 and requires further investigation to see whether the people with different FHs require different types or level of support to help improve their QoL. For adults, generic quality of life was reportedly worse than UK norms and for all groups generic quality of life related to pain, anxiety and depression was reportedly worse than other sub-domains such as usual activities, mobility or self-care. This is similar to the wave 1 findings and also needs further investigation. Those who completed the surveys at both time points, reported generic QoL was significantly worse at wave 2 compared to wave 1, however, adults with food intolerance or coeliac disease reported significantly poorer FH specific QoL in wave 1 compared to wave 2. Further analysis of the data comparing the whole of cohort 1 and cohort 2 could provide reasons for this, such as differences in clinical factors or severity for these participants. For all groups who completed the surveys at both time points, reported generic QoL was significantly worse at wave 2 compared to wave 1. As this is generic QoL, this reduction could be due to factors beyond FH, such as the continued impact of Covid and the restrictions this has brought to day-to-day living.

Limitations

There are some limitations to take into consideration in this report. It is not known how representative of the UK FH population the survey is, as prevalence of different FHs are not yet known. For adults and parents there was a predominance of female respondents and so results may not always also apply to men. However, parents reported FHs for almost equal numbers of male and female children; similarly, the gender split was more equal for the child self-report survey. Across all surveys there was a predominance of participants with a White British background and results may be different for people from different ethnic backgrounds. Many of the respondents reported having another long-term condition or psychological therapy. These other conditions could have an impact on daily life such as the ability to eat out and could have had an impact on the quality of life results. Further analysis of the data in this report could look at controlling for these variables in the analysis.

A wide variety of foods were reported, however, to avoid overburdening respondents, the survey only asked for specific details on up to three foods per participants (and for parents, for three foods per child in up to three children). This means that more detailed data is missing for those with hypersensitivity to more than three foods or more than three children with FH. This may have affected only a minor number of participants though, as across all groups the majority reported reacting to just one food.

Some groups reported symptoms that would not be expected. For example, a small number with self-reported coeliac disease or food intolerance reported anaphylaxis (as was found in wave 1). A definition of anaphylaxis was given to participants and so confusion as to what the term meant may not be the cause of this. It is possible that some participants had undiagnosed food allergy which caused an anaphylactic reaction, but it is unlikely that such a severe reaction would have gone undiagnosed. It may also be the case that these participants misinterpreted their condition

and had a food allergy. Misunderstanding of the different FHs and erroneous self-diagnosis is common (Knibb, 2019).

Covid-19 restrictions were different in wave 1 compared to wave 2, with stricter restrictions during wave 1. This might have had an impact on experiences such as eating out. The change in restrictions across the year should also be considered when examining the results.

Food Sensitive Study: References

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Annex of Tables

Annex A: Adults with food hypersensitivities

For the following tables, percentages may add up to more than 100, due to rounding. Additionally, '**' indicates below '0.5%'.

Table 4: Ethnicity by food hypersensitivity

Ethnicity	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
White British/Irish	984 (93)	281 (88)	311 (94)	216 (99)	120 (92)

Ethnicity	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Mixed/multiple ethnicity	20 (2)	9 (3)	5 (2)	-	4 (3)
Asian (Indian, Chinese, Bangladeshi, Pakistani) background	30 (3)	19 (6)	7 (2)	-	1 (1)
Black British/African/Caribbean	18 (2)	6 (2)	6 (2)	-	4 (3)
Arab	2 (*)	2 (1)	-	-	-
Other ethnic group	5 (*)	2 (1)	1 (*)	1 (*)	1 (1)
Total (N)	1059	319	330	217	130

Table 5: Region by food hypersensitivity

Region	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Scotland	85 (8)	28 (8)	26 (8)	17 (8)	7 (5)
Northern Ireland	14 (1)	4 (1)	5 (2)	1 (*)	2 (2)
Wales	57 (5)	18 (6)	20 (6)	12 (6)	4 (3)
North East of England	42 (4)	12 (4)	13 (4)	8 (4)	4 (3)
North West of England	91 (9)	24 (7)	22 (7)	27 (12)	12 (9)
Yorkshire and the Humber	76 (7)	24 (7)	24 (7)	10 (5)	12 (9)
East of England	115 (11)	28 (9)	46 (14)	27 (12)	11 (8)
East Midlands	73 (7)	23 (7)	28 (8)	27 (12)	11 (8)
West Midlands	103 (10)	28 (9)	33 (10)	24 (11)	13 (10)
London	106 (10)	50 (16)	21 (6)	13 (6)	13 (10)
South West of England	101 (9)	24 (7)	36 (11)	21 (10)	13 (10)
South East of England	202 (19)	60 (19)	56 (17)	44 (20)	31 (24)
Total (N)	1065	323	330	217	131

Table 6: Employment status by food hypersensitivity

Employment	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Full time	347 (33)	118 (38)	104 (32)	60 (28)	44 (34)
Part time	192 (18)	61 (19)	63 (20)	35 (16)	22 (17)
Unemployed	36 (3)	15 (5)	16 (5)	3 (1)	1 (1)
Not working	153 (15)	45 (14)	54 (17)	17 (8)	22 (17)
Not working (retired)	267 (26)	55 (18)	78 (24)	91 (42)	33 (25)
Student	28 (3)	14 (4)	3 (1)	3 (1)	5 (4)
Other	23 (2)	6 (2)	4 (1)	7 (3)	3 (2)
Total (N)	1046	314	322	216	130

Table 7: All foods reacted to (no limit on number of foods reported) by hypersensitivity

Food	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Celery	71 (2)	36 (2)	15 (2)	3 (1)	13 (2)
Cereals containing gluten (wheat, rye barley or oats)	481 (14)	55 (4)	110 (12)	212 (66)	82 (15)
Crustaceans (such as prawns, crabs, scampi or lobsters)	137 (4)	59 (4)	38 (4)	6 (2)	26 (5)
Eggs	153 (4)	53 (4)	50 (5)	4 (1)	27 (5)

Food	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Fish	100 (3)	43 (3)	21 (2)	3 (1)	27 (5)
Lupin	37 (1)	18 (1)	6 (1)	-	10 (2)
Milk	297 (8)	68 (5)	119 (13)	21 (7)	59 (11)
Molluscs (such as mussels, snails, squid, whelks, clams or oysters)	107 (3)	47 (3)	28 (3)	4 (1)	21 (4)
Mustard	58 (2)	17 (1)	19 (2)	4 (1)	10 (2)
Peanuts	167 (5)	101 (7)	27 (3)	3 (1)	24 (4)
Tree nuts: Almonds	134 (4)	87 (6)	24 (3)	1 (*)	15 (3)
Tree nuts: Hazelnuts	136 (4)	91 (6)	23 (3)	3 (1)	17 (3)
Tree nuts: Brazil nuts	121 (3)	79 (5)	24 (3)	3 (1)	13 (2)
Tree nuts: Walnuts	133 (4)	89 (6)	22 (2)	2 (1)	15 (3)
Tree nuts: Cashew	109 (3)	73 (5)	17 (2)	1 (*)	14 (2)
Tree nuts: Pecans	110 (3)	78 (5)	14 (2)	1 (*)	14 (2)
Tree nuts: Macadamia nuts	100 (3)	72 (5)	16 (2)	1 (*)	9 (2)
Tree nuts: Pistachios	109 (3)	66 (4)	23 (3)	1 (*)	15 (3)
Sesame seeds	53 (2)	31 (2)	10 (1)	2 (1)	9 (2)
Soybeans	105 (3)	31 (2)	45 (5)	5 (2)	16 (3)
Sulphur dioxide	103 (3)	39 (3)	31 (3)	4 (1)	15 (3)
Fruit	254 (7)	104 (7)	68 (7)	12 (4)	42 (7)
Vegetables	204 (6)	56 (4)	78 (8)	13 (4)	33 (6)
Other	247 (7)	77 (5)	91 (10)	12 (4)	35 (6)
Total (N)	3526	1470	919	319	561

Table 8: All foods resulting in adverse reactions by hypersensitivity

Food	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Celery	16 (1)	11 (2)	1 (*)	-	3 (1)
Cereals containing gluten (wheat, rye barley or oats)	403 (26)	26 (6)	81 (19)	213 (92)	66 (21)
Crustaceans (such as prawns, crabs, scampi or lobsters)	58 (4)	28 (6)	13 (3)	1 (*)	14 (4)
Eggs	94 (6)	30 (6)	28 (7)	-	25 (8)
Fish	44 (3)	18 (4)	9 (2)	-	15 (5)
Lupin	12 (1)	6 (1)	1 (*)	-	5 (2)
Milk	178 (11)	32 (7)	83 (19)	5 (2)	48 (15)
Molluscs (such as mussels, snails, squid, whelks, clams or oysters)	29 (2)	12 (3)	9 (2)	-	6 (2)
Mustard	17 (1)	5 (1)	3 (1)	-	8 (3)
Peanuts	94 (6)	69 (15)	9 (2)	-	12 (4)
Tree nuts	102 (7)	58 (13)	15 (3)	-	19 (6)
Sesame seeds	13 (1)	9 (2)	2 (*)	-	1 (*)
Soybeans	38 (2)	10 (2)	14 (3)	3 (1)	7 (2)
Sulphur dioxide and sulphites	28 (2)	10 (2)	14 (3)	-	4 (1)
Fruit	117 (8)	59 (13)	22 (5)	1 (*)	25 (8)
Vegetables	84 (5)	12 (3)	43 (10)	4 (2)	15 (5)
Other	222 (14)	71 (15)	82 (19)	5 (2)	44 (14)
Total (N)	1549	466	429	232	317

Table 9: All symptoms usually experienced for all foods reported, according to hypersensitivity group

Symptoms reported	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Breathing	1821 (19)	1053 (28)	311 (94)	216 (99)	120 (92)
Skin	20 (2)	9 (3)	5 (2)	-	4 (3)
Gastrointestinal	30 (3)	19 (6)	7 (2)	-	1 (1)
Mouth/throat/ear	18 (2)	6 (2)	6 (2)	-	4 (3)
Other	2 (*)	2 (1)	-	-	-
Total (N)	1059	319	330	217	130

Table 10: Gastrointestinal symptoms for all foods reported, by hypersensitivity group

Gastrointestinal symptoms reported	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Bloated stomach	668 (16)	95 (13)	215 (18)	164 (16)	152 (16)
Abdominal pain/stomach cramps	783 (19)	145 (19)	241 (20)	172 (17)	168 (18)
Heart burn	223 (5)	49 (7)	63 (5)	36 (4)	44 (5)
Sickness/vomiting	783 (19)	240 (32)	166 (14)	166 (16)	165 (18)
Diarrhoea	637 (15)	104 (14)	180 (15)	168 (17)	145 (15)
Blood in stool	53 (1)	12 (2)	13 (1)	13 (1)	14 (1)
Dehydration	97 (2)	16 (2)	13 (1)	31 (3)	29 (3)
Loss of weight/malnutrition	106 (3)	10 (1)	13 (1)	52 (5)	30 (3)
Excessive wind	400 (10)	32 (4)	133 (11)	107 (11)	94 (10)
Irritable bowel symptoms	433 (10)	50 (7)	143 (12)	106 (10)	95 (10)
Total (N)	4183	753	1180	1015	936

Table 11: Breathing symptoms and anaphylaxis experienced for all foods reported, by hypersensitivity group

Breathing symptoms reported	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Cough/sneezing	219 (11)	128 (11)	41 (15)	2 (7)	41 (10)
Runny nose	205 (10)	101 (8)	38 (14)	5 (18)	45 (11)
Irritable/ itchy nose	240 (12)	127 (11)	47 (17)	2 (7)	44 (11)
Congested nose	176 (9)	74 (6)	42 (15)	3 (11)	36 (9)
Wheezing	283 (14)	175 (15)	31 (11)	3 (11)	64 (16)
Tight chest	298 (15)	185 (15)	33 (12)	6 (21)	61 (15)
Breathless	263 (13)	173 (14)	20 (7)	5 (18)	50 (13)
Asthma	137 (7)	90 (8)	14 (5)	2 (7)	24 (6)
Anaphylaxis	190 (9)	141 (12)	8 (3)	-	32 (8)
Total (N)	2011	1194	274	28	397

Table 12: Most severe symptoms ever experienced for all foods reported, by hypersensitivity group

Most severe symptoms reported	All adults N (%)	Food Allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
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Breathing	1069 (18)	611 (25)	163 (13)	16 (2)	220 (17)
Skin	1097 (18)	589 (24)	159 (13)	59 (8)	215 (16)
Gastrointestinal	2604 (43)	494 (20)	762 (62)	585 (80)	612 (46)
Mouth/throat/ear	811 (13)	507 (21)	79 (7)	15 (2)	158 (12)
Other	491 (8)	222 (9)	62 (5)	58 (8)	126 (9)
Total (N)	6072	2423	1225	733	1331

Table 13: Time period in which symptoms usually start, by hypersensitivity

Time symptoms usually start after eating the reported food	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Less than 5 minutes	378 (25)	216 (47)	51 (13)	5 (2)	76 (24)
5 to 30 minutes	451 (30)	138 (30)	141 (34)	38 (17)	100 (32)
30 minutes to 1 hour	257 (17)	56 (12)	80 (19)	50 (22)	58 (18)
1 to 2 hours	185 (12)	19 (4)	65 (16)	52 (23)	41 (13)
More than 2 hours	184 (12)	24 (5)	66 (16)	55 (24)	32 (10)
Don't know	63 (4)	6 (1)	12 (3)	26 (12)	9 (3)
Total (N)	1518	459	415	226	316

Table 14: Diagnosis method by hypersensitivity

Diagnosis method	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Healthcare professional's diagnosis	312 (17)	122 (22)	76 (17)	17 (6)	77 (21)
Skin prick test	177 (10)	112 (20)	25 (6)	-	32 (8)
Blood test (antibodies for allergen)	315 (17)	93 (17)	26 (6)	123 (43)	67 (18)
Food challenge	81 (4)	32 (6)	20 (4)	6 (2)	17 (5)
Not formally diagnosed but noticed symptoms themselves (self)	507 (28)	120 (21)	230 (51)	8 (3)	101 (28)
Complementary/alternative Therapist	56 (3)	9 (2)	24 (5)	3 (1)	18 (5)
Don't know/can't remember	81 (4)	21 (4)	14 (3)	2 (1)	11 (3)
Other	276 (15)	51 (9)	39 (9)	127 (44)	43 (12)
Total (N)	1805	560	454	286	366

Table 15: Frequency of reactions to all foods in the previous 12 months

Frequency of reactions	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Once	193 (13)	74 (16)	30 (7)	35 (15)	46 (15)
Twice	187 (12)	53 (12)	57 (14)	33 (14)	33 (10)
Between 3 and 6 times	257 (17)	69 (15)	89 (22)	44 (19)	40 (13)
Between 7 and 10 times	68 (4)	12 (3)	28 (7)	8 (4)	19 (6)
More than 10 times	177 (12)	39 (8)	72 (17)	13 (6)	33 (10)
I haven't reacted to this food in the last year	542 (36)	191 (42)	114 (28)	81 (36)	122 (39)
Don't know	87 (6)	18 (4)	21 (5)	14 (6)	22 (7)
Total (N)	1511	456	411	228	315

Table 16: Where adults experienced their most recent adverse reaction, by hypersensitivity

Where reaction occurred	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Home	901 (62)	249 (56)	288 (72)	134 (63)	163 (53)
Work	106 (7)	30 (7)	19 (5)	13 (6)	37 (12)
Family and friends house	100 (7)	35 (8)	20 (5)	4 (2)	34 (11)
Public transport	21 (1)	10 (2)	5 (1)	2 (1)	3 (1)
Eating out	204 (14)	72 (16)	46 (12)	33 (15)	42 (14)
Other	80 (5)	36 (8)	18 (3)	11 (5)	16 (5)
Can't remember	49 (3)	13 (3)	8 (2)	16 (8)	12 (4)
Total (N)	1461	445	399	213	307

Table 17: Who treated adult respondents' most recent reactions across hypersensitivities

Who treated reaction	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
I treated the reaction myself	1114 (74)	300 (64)	333 (81)	182 (85)	222 (70)
I had medical help for my reaction	223 (15)	114 (24)	39 (9)	9 (4)	47 (15)
Someone else helped me to treat the reaction	71 (5)	27 (6)	12 (3)	4 (2)	22 (7)
I have not reacted to this food before	17 (1)	4 (1)	5 (1)	3 (1)	3 (1)
Can't remember	87 (6)	25 (5)	21 (5)	15 (7)	22 (7)
Total	1512	470	410	213	216

Table 18: Experience of anaphylaxis across all foods reported

Experience of anaphylaxis	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	351 (24)	201 (44)	42 (10)	4 (2)	91 (29)
No	1007 (68)	194 (43)	335 (83)	209 (93)	200 (65)
Not sure	126 (8)	57 (13)	25 (6)	11 (5)	19 (6)
Total (N)	1484	452	402	224	310

Table 19: Experience of anaphylaxis in the last 12 months across all foods reported

Experience of anaphylaxis in last 12 months	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	213 (14)	96 (21)	33 (8)	4 (2)	64 (21)
No	1198 (81)	322 (72)	357 (89)	216 (96)	234 (75)
Not sure	70 (5)	31 (7)	12 (3)	4 (2)	12 (4)
Total (N)	1481	449	402	224	310

Table 20: Frequency of hospital admissions in the last 12 months, for all foods reported

Frequency of admission for those admitted to hospital	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
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Haven't been admitted in the last 12 months	161 (53)	84 (54)	23 (58)	16 (80)	28 (38)
Once	75 (25)	42 (27)	8 (20)	3 (15)	19 (26)
Twice	23 (8)	8 (5)	5 (13)	-	9 (12)
Between 3 and 6 times	25 (8)	13 (8)	2 (5)	-	9 (12)
Between 7 and 10 times	8 (3)	2 (1)	2 (5)	-	4 (5)
More than 10 times	7 (2)	4 (3)	-	-	3 (4)
Don't know	6 (2)	3 (2)	-	1 (5)	1 (1)
Total (N)	305	156	40	20	73

Table 21: Admission to hospital in an emergency the first time participants reacted to their stated food

Admission to hospital for first reaction to food	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Yes	221 (75)	114 (77)	26 (67)	5 (26)	64 (86)
No	75 (25)	34 (23)	13 (33)	14 (74)	10 (14)
Total (N)	296	148	39	19	74

Table 22: Frequency of eating out or getting food to take away from a restaurant or other food outlet, by hypersensitivity

Frequency	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
At least once a day	13 (1)	6 (2)	1 (*)	1 (*)	5 (4)
5 to 6 times a week	18 (2)	6 (2)	4 (1)	1 (*)	6 (5)
3 to 4 times a week	44 (4)	15 (5)	13 (4)	6 (3)	7 (6)
Once or twice a week	168 (17)	63 (21)	45 (15)	33 (16)	17 (13)
Once a fortnight	174 (117)	59 (20)	56 (18)	31 (15)	22 (17)
Once a month	184 (18)	57 (19)	56 (18)	31 (15)	22 (17)
Less than once a month	313 (31)	69 (23)	99 (32)	85 (40)	42 (33)
Never	82 (8)	25 (8)	30 (10)	7 (3)	13 (10)
Total (N)	996	300	306	211	126

Table 23: How comfortable adult respondents feel asking a member of staff for information about the food they are selling when eating out, by food hypersensitivity

Level of confidence in information provided	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly confident	576 (63)	177 (64)	161 (59)	137 (67)	73 (64)
Not very or not at all confident	238 (26)	75 (27)	72 (26)	50 (24)	31 (27)
Varies from place to place	79 (9)	21 (8)	27 (10)	18 (9)	8 (7)
Don't know	24 (3)	5 (2)	13 (5)	-	2 (2)
Total (N)	917	278	273	205	114

Table 24: Confidence that written information provided when eating out allows identification of foods that cause a bad or unpleasant physical reaction, by food hypersensitivity

Level of confidence in information provided	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
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Very or fairly confident	549 (60)	159 (57)	173 (63)	138 (67)	57 (50)
Not very or not at all confident	262 (29)	87 (31)	64 (25)	49 (24)	43 (38)
Varies from place to place	84 (9)	23 (8)	24 (9)	18 (9)	13 (12)
Don't know	22 (2)	10 (4)	9 (3)	-	-
Total (N)	917	279	273	205	113

Table 25: Confidence that verbal information provided when eating out allows identification of foods that cause a bad or unpleasant physical reaction, by food hypersensitivity

Level of confidence in information provided	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly confident	475 (52)	143 (51)	151 (55)	107 (52)	53 (46)
Not very or not at all confident	312 (34)	100 (36)	85 (31)	66 (32)	41 (36)
Varies from place to place	106 (12)	28 (10)	26 (10)	31 (15)	19 (17)
Don't know	24 (3)	8 (3)	11 (4)	-	1 (1)
Total (N)	917	279	273	204	114

Table 26: Frequency of adults being offered allergens in the last 12 months, despite checking available information

Frequency of being offered food	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Once	158 (18)	49 (18)	36 (14)	33 (17)	34 (31)
Twice	102 (12)	20 (7)	33 (13)	32 (16)	14 (13)
Between 3 to 6 times	64 (7)	20 (7)	13 (5)	13 (7)	15 (14)
Between 7 to 10 times	12 (1)	2 (1)	6 (2)	1 (1)	1 (1)
More than 10 times	9 (1)	4 (1)	2 (1)	2 (1)	1 (1)
This hasn't happened in the last 12 months	515 (60)	172 (64)	159 (64)	113 (58)	46 (41)
Total	860	267	249	194	111

Table 27: Comparisons for adult participants taking part in Wave 1 and Wave 2 surveys

Wave	All adults N (%)	Food allergy N (%)	Food intolerances N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Wave 1	1019 (100)	170 (16.7)	216 (21.2)	409 (40.1)	135 (13.2)
Wave 2	1065 (100)	323 (30.3)	330 (31.0)	217 (20.4)	131 (12)
Both Waves	313 (100)	44	38	162 (52)	56

Annex B – Parents of children with food hypersensitivities

Table 28: Ethnicity of parent respondents by child's food hypersensitivity

Ethnicity	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
White British/Irish	657	353 (88)	159 (90)	18 (86)	109 (82)
Mixed/multiple ethnicity	27	13 (3)	2 (1)	-	11 (8)

Ethnicity	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Asian (Indian, Chinese, Bangladeshi, Pakistani) background	42	19 (5)	10 (6)	2 (10)	10 (8)
Black British/African/Caribbean	19	11 (3)	5 (3)	1 (5)	2 (2)
Arab	-	-	-	-	-
Other ethnic group	-	-	-	-	-
Total (N)	745	399	176	21	132

Table 29: Region of parent respondents, by child's food hypersensitivity

Region	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Scotland	64 (9)	31 (8)	19 (11)	-	13 (10)
Northern Ireland	20 (3)	9 (2)	9 (5)	-	2 (1)
Wales	32 (4)	15 (4)	8 (5)	1 (5)	8 (6)
North East of England	30 (4)	13 (3)	5 (3)	1 (5)	9 (7)
North West of England	75 (10)	42 (11)	12 (7)	3 (14)	15 (11)
Yorkshire and the Humber	59 (8)	33 (8)	15 (9)	1 (5)	9 (7)
East of England	64 (9)	36 (9)	16 (9)	2 (10)	(75)
East Midlands	43 (6)	23 (6)	12 (7)	-	8 (6)
West Midlands	79 (11)	46 (12)	15 (9)	2 (10)	14 (10)
London	126 (17)	66 (17)	20 (11)	6 (29)	31 (23)
South West of England	55 (7)	32 (8)	14 (8)	-	6 (4)
South East of England	104 (14)	53 (13)	31 (18)	5 (24)	12 (9)
Total (N)	750	399	176	21	134

Table 30: Parent respondent employment status, by child's hypersensitivity

Employment status	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Full-time	388 (52)	194 (49)	88 (51)	8 (38)	86 (64)
Part-time	198 (27)	116 (29)	39 (23)	8 (38)	33 (25)
Unemployed	10 (1)	3 (1)	3 (2)	-	4 (3)
Not working	124 (17)	68 (17)	37 (22)	5 (24)	10 (7)
Not working (retired)	1 (*)	1 (*)	-	-	-
Student	11 (2)	5 (1)	4 (2)	-	1 (1)
Other	10 (1)	8 (2)	1 (1)	-	-
Total (N)	742	395	172	21	134

Table 31: Ethnicity of children reported by parents, by child's hypersensitivity

Ethnicity	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
White British/Irish	778 (84)	358 (84)	164 (90)	21 (88)	213 (80)
Mixed/multiple ethnicity	73 (8)	40 (9)	7 (4)	2 (8)	21 (8)
Asian (Indian, Chinese, Bangladeshi, Pakistani) background	48 (5)	17 (4)	10 (5)	-	21 (8)

Ethnicity	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Black British/African/Caribbean	23 (2)	11 (3)	1 (1)	1 (4)	10 (4)
Arab	-	-	-	-	-
Other ethnic group	-	-	-	-	-
Total (N)	922	426	182	24	265

Table 32: All foods (no limit on numbers reported) children of participants react to, by child's hypersensitivity

Food	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Celery	113 (4)	21 (1)	10 (3)	2 (4)	78 (10)
Cereals containing gluten (wheat, rye, barley or oats)	193 (6)	42 (2)	37 (10)	19 (42)	88 (11)
Crustaceans (such as prawns, crabs, scampi or lobsters)	99 (3)	33 (2)	14 (4)	3 (7)	48 (6)
Eggs	317 (10)	166 (9)	53 (15)	1 (2)	87 (11)
Fish	130 (4)	50 (3)	23 (6)	2 (4)	50 (6)
Lupin	45 (1)	10 (1)	4 (1)	3 (7)	24 (3)
Milk	352 (12)	161 (9)	106 (29)	3 (7)	71 (9)
Molluscs (such as mussels, snails, squid, whelks, clams or oysters)	33 (1)	19 (1)	3 (1)	1 (2)	8 (1)
Mustard	47 (2)	19 (1)	5 (1)	1 (2)	22 (3)
Peanuts	236 (8)	173 (10)	15 (4)	2 (4)	41 (5)
Tree nuts: Almonds	130 (4)	98 (6)	2 (1)	-	26 (3)
Tree nuts: Hazelnuts	151 (5)	109 (6)	8 (2)	1 (2)	30 (4)
Tree nuts: Brazil nuts	120 (4)	89 (5)	4 (1)	1 (2)	24 (3)
Tree nuts: Walnuts	131 (4)	104 (6)	3 (1)	1 (2)	21 (3)
Tree nuts: Cashew nuts	151 (5)	111 (6)	8 (2)	1 (2)	27 (3)
Tree nuts: Pecans	118 (4)	87 (5)	3 (1)	-	26 (3)
Tree nuts: Macadamia nuts	101 (3)	82 (5)	2 (1)	1 (2)	14 (2)
Tree nuts: Pistachios	134 (4)	101 (6)	2 (1)	-	29 (4)
Sesame seed	100 (3)	69 (4)	7 (2)	-	22 (3)
Soybeans	90 (3)	49 (3)	15 (4)	-	23 (3)
Sulphur dioxide	19 (1)	6 (*)	4 (1)	-	6 (1)
Fruit	100 (3)	71 (4)	13 (4)	1 (2)	13 (2)
Vegetables	59 (2)	34 (2)	9 (3)	1 (2)	12 (2)
Other	83 (3)	58 (3)	10 (3)	1 (2)	10 (1)
Total (N)	3052	1762	360	45	800

Table 33: All foods resulting in an adverse reaction, by child's hypersensitivity

All foods	All parents N (%)	Food allergy N (%)	Food intolerance (N%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Celery	69 (5)	14 (2)	3 (1)	2 (7)	51 (8)
Cereals containing gluten (wheat, rye, barley or oats)	118 (8)	19 (3)	21 (10)	15 (52)	59 (9)

All foods	All parents N (%)	Food allergy N (%)	Food intolerance (N%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Crustaceans (such as prawns, crabs, scampi or lobsters)	41 (3)	5 (1)	6 (3)	-	28 (4)
Eggs	215 (14)	107 (18)	30 (15)	3 (10)	70 (11)
Fish	87 (6)	23 (4)	12 (6)	-	47 (7)
Lupin	25 (2)	2 (*)	-	-	23 (4)
Milk	296 (19)	133 (22)	90 (44)	3 (10)	63 (10)
Molluscs (such as mussels, snails, squid, whelks, clams or oysters)	14 (1)	2 (*)	-	-	12 (2)
Mustard	14 (1)	3 (*)	1 (*)	-	10 (2)
Peanuts	142 (9)	111 (18)	3 (1)	-	26 (4)
Tree nuts	198 (13)	91 (15)	10 (5)	4 (14)	190 (30)
Sesame seed	40 (3)	27 (4)	-	-	12 (2)
Soybeans	46 (3)	15 (2)	4 (2)	-	23 (4)
Sulphur dioxide and sulphites	14 (1)	-	2 (1)	-	10 (2)
Fruit	49 (3)	32 (5)	8 (4)	1 (3)	7 (1)
Vegetables	17 (1)	9 (1)	3 (1)	1 (3)	2 (*)
Other	38 (2)	18 (3)	12 (6)	-	5
Total (N)	1523	611	205	29	638

Table 34: All symptoms usually experienced by all children reported by parent respondents, according to child's hypersensitivity

Symptoms reported	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Breathing	2745 (27)	1401 (30)	236 (22)	16 (14)	1022 (26)
Skin	2444 (24)	1340 (28)	209 (20)	16 (14)	826 (21)
Gastrointestinal	2795 (28)	1067 (23)	506 (48)	67 (58)	1076 (27)
Mouth/throat/ear	1250 (12)	643 (14)	52 (5)	6 (5)	521 (13)
Other	894 (9)	278 (6)	45 (4)	10 (9)	534 (13)
Total (N)	10,128	4729	1048	115	3979

Table 35: Gastrointestinal symptoms for all foods reported, by child's hypersensitivity

Gastrointestinal symptoms reported	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Bloated stomach	350 (13)	125 (12)	98 (19)	12 (18)	107 (10)
Abdominal pain/stomach cramps	501 (18)	221 (21)	108 (21)	15 (22)	146 (14)
Heart burn	208 (7)	37 (3)	17 (3)	6 (9)	141 (13)
Sickness/vomiting	764 (27)	356 (33)	89 (18)	16 (24)	283 (26)
Diarrhoea	403 (14)	160 (15)	94 (19)	5 (7)	137 (13)
Blood in stool	102 (4)	23 (2)	4 (1)	2 (3)	70 (7)
Dehydration	83 (3)	23 (2)	8 (2)	-	48 (4)
Loss of weight/malnutrition	69 (2)	14 (1)	4 (1)	4 (6)	44 (4)
Excessive wind	171 (6)	63 (6)	41 (8)	4 (6)	57 (5)
Irritable bowel symptoms	144 (5)	45 (4)	43 (8)	4 (4)	43 (4)
Total (N)	2795	1067	506	67	1076

Table 36: Breathing symptoms and anaphylaxis experienced by all children reported on for all foods, by child's hypersensitivity

Breathing symptoms reported	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Cough/sneezing	478 (16)	255 (16)	31 (13)	1 (6)	181 (17)
Runny nose	459 (19)	182 (12)	52 (22)	1 (6)	214 (20)
Irritable/ itchy nose	421 (14)	176 (12)	39 (16)	8 (50)	190 (17)
Congested nose	288 (10)	115 (7)	26 (11)	3 (19)	132 (12)
Wheezing	385 (13)	220 (14)	27 (11)	1 (6)	124 (11)
Tight chest	290 (10)	172 (11)	26 (11)	1 (6)	85 (8)
Breathless	285 (10)	187 (12)	17 (7)	1 (6)	73 (7)
Asthma	139 (5)	94 (6)	18 (8)	-	23 (2)
Anaphylaxis	232 (8)	161 (10)	4 (2)	-	64 (6)
Total (N)	2977	1562	240	16	1086

Table 37: Most severe symptoms ever experienced across all foods reported, by child's hypersensitivity

Most severe symptoms reported	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Breathing	1889 (25)	746 (26)	153 (21)	12 (15)	930 (25)
Skin	1763 (23)	808 (28)	136 (18)	9 (12)	774 (21)
Gastrointestinal	2090 (28)	699 (24)	364 (49)	41 (53)	944 (26)
Mouth/throat/ear	965 (13)	382 (13)	49 (7)	8 (10)	504 (14)
Other	856 (11)	254 (8)	43 (6)	8 (10)	532 (14)
Total (N)	7563	2889	745	78	3684

Table 38: Time period in which symptoms usually start, by child's hypersensitivity

Time symptoms usually start after eating the reported foods	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Less than 5 mins	400 (27)	282 (49)	25 (13)	4 (15)	81 (13)
5 to 30 mins	480 (33)	166 (29)	95 (48)	5 (19)	211 (34)
30 mins to 1 hour	284 (19)	48 (8)	38 (19)	5 (19)	188 (30)
1 to 2 hours	193 (10)	30 (5)	19 (10)	3 (11)	81 (13)
More than 2 hours	104 (7)	24 (4)	21 (11)	4 (15)	48 (8)
Don't know	51 (3)	29 (5)	2 (1)	6 (22)	9 (1)
Total (N)	1462	579	200	27	618

Table 39: Diagnosis method for all foods, by child's food hypersensitivity

Diagnosis method	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Healthcare professional's diagnosis	395 (21)	142 (18)	70 (33)	4 (15)	174 (22)
Skin prick test	463 (25)	267 (33)	26 (12)	3 (11)	158 (20)
Blood test (antibodies for specified food)	425 (23)	194 (24)	23 (11)	12 (44)	190 (24)
Food challenge	179 (9)	71 (9)	18 (8)	-	82 (10)

Diagnosis method	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Not formally diagnosed but noticed symptoms	260 (14)	62 (8)	71 (33)	3 (11)	117 (15)
Complementary alternative therapist	56 (3)	12 (1)	2 (1)	1 (4)	41 (5)
Don't know/can't remember	25 (1)	6 (1)	3 (1)	1 (4)	9 (1)
Other	82 (4)	55 (7)	2 (1)	3 (11)	18 (2)
Total (N)	1885	809	215	27	789

Table 40: Frequency of reactions to first food in the previous 12 months

Frequency of reactions	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Once	279 (19)	99 (17)	23 (12)	6 (23)	147 (24)
Twice	300 (21)	98 (17)	47 (24)	4 (15)	141 (23)
Between 3 and 6 times	288 (20)	95 (16)	56 (28)	6 (23)	125 (21)
Between 7 and 10 times	112 (8)	17 (3)	18 (9)	1 (4)	74 (12)
More than 10 times	84 (6)	30 (5)	25 (13)	3 (12)	24 (4)
They haven't reacted to this food in the last year	350 (24)	229 (39)	25 (13)	5 (19)	81 (13)
Don't know	33 (2)	12 (2)	3 (2)	1 (4)	12 (2)
Total (N)	1446	580	197	26	604

Table 41: Where parents report their child's most recent experience of an adverse reactions to foods occurred, by hypersensitivity

Where reaction occurred	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Home	715 (52)	348 (64)	141 (73)	9 (39)	191 (33)
School	189 (14)	61 (11)	20 (10)	3 (13)	103 (18)
Work	145 (10)	14 (3)	9 (5)	4 (17)	93 (16)
Family and friends house	137 (10)	29 (5)	10 (5)	4 (17)	93 (16)
Public transport	51 (4)	6 (1)	2 (1)	1 (4)	40 (7)
Eating out	64 (5)	39 (7)	2 (1)	-	22 (4)
Other	58 (4)	35 (6)	5 (3)	2 (9)	7 (3)
Can't remember	23 (2)	11 (2)	3 (2)	-	15 (1)
Total (N)	1382	543	192	23	587

Table 42: Who treated childrens' most recent reactions, reported by parents, across hypersensitivities

Who treated reaction	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
I treated the reaction myself	710 (45)	366 (59)	123 (57)	11 (42)	192 (29)
My child treated the reaction themselves	292 (19)	36 (6)	52 (24)	7 (27)	186 (28)
They had medical help for their reaction	360 (23)	148 (24)	26 (12)	3 (12)	178 (26)
Someone else helped them to treat the reaction	127 (8)	26 (4)	7 (3)	3 (12)	91 (14)

Who treated reaction	All adults N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
They have not reacted to this food before	45 (3)	28 (5)	2 (1)	2 (8)	13 (2)
Can't remember	38 (2)	13 (2)	6 (3)	-	12 (2)
Total	1572	617	216	26	272

Table 43: Experience of anaphylaxis across all foods reported

Experience of anaphylaxis	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	657 (47)	223 (41)	28 (15)	3 (12)	391 (66)
No	645 (46)	263 (48)	159 (83)	22 (85)	181 (30)
Not sure	97 (7)	64 (12)	4 (2)	1 (4)	22 (4)
Total (N)	1399	550	191	26	594

Table 44: Experience of anaphylaxis in the last 12 months, across all foods reported

Experience of anaphylaxis in the last 12 months	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	488 (35)	118 (21)	20 (11)	3 (13)	338 (57)
No	825 (59)	389 (71)	160 (85)	20 (83)	232 (39)
Not sure	79 (6)	43 (8)	9 (5)	1 (4)	21 (4)
Total (N)	1392	550	189	24	591

Table 45: Frequency of hospital admissions for children, as reported by their parents

Frequency of admission for those admitted to hospital	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Haven't been admitted in the last 12 months	162 (23)	109 (50)	10 (25)	1 (25)	40 (9)
Once	185 (26)	56 (26)	13 (33)	1 (25)	114 (27)
Twice	177 (25)	40 (18)	13 (33)	1 (25)	121 (28)
Between 3 and 6 times	108 (15)	7 (3)	3 (8)	1 (25)	93 (22)
Between 7 and 10 times	46 (7)	1 (*)	-	-	42 (10)
More than 10 times	16 (2)	2 (1)	-	-	14 (3)
Don't know	6 (1)	3 (1)	1 (3)	-	1 (*)
Total (N)	700	218	40	4	425

Table 46: Admission to hospital for a child's first time reaction to a food, reported by parents

Admission to hospital for first reaction to food	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	539 (79)	164 (76)	28 (70)	3 (75)	336 (82)
No	144 (21)	53 (24)	12 (30)	1 (25)	75 (18)
Total (N)	683	217	40	4	411

Table 47: Frequency of parents' households eating out or getting food to takeaway, by child's hypersensitivity

Frequency	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
At least once a day	24 (4)	8 (2)	4 (3)	2 (10)	9 (8)
5-6 times a week	34 (5)	9 (3)	5 (3)	-	19 (16)
3-4 times a week	43 (7)	14 (4)	4 (3)	1 (5)	22 (18)
Once or twice a week	119 (18)	64 (19)	30 (19)	5 (25)	18 (15)
Once a fortnight	127 (19)	69 (20)	36 (23)	5 (25)	17 (14)
Once a month	123 (19)	68 (20)	36 (23)	3 (15)	12 (10)
Less than once a month	139 (21)	83 (24)	34 (22)	4 (20)	14 (12)
Never	37 (6)	24 (7)	7 (4)	-	4 (3)
Don't know	7 (1)	1 (8)	1 (1)	-	4 (3)
Total (N)	653	340	157	20	119

Table 48: How comfortable parent respondents feel about asking a member of staff for information about the food they are selling when eating out, because of a concern about their child's food hypersensitivity, by child's hypersensitivity

Level of comfort asking for information	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly comfortable	433 (72)	231 (74)	114 (77)	12 (63)	70 (65)
Not very or not at all comfortable	126 (21)	62 (20)	22 (15)	5 (26)	32 (30)
Varies from place to place	35 (6)	18 (6)	10 (7)	2 (11)	4 (4)
Don't know	8 (1)	2 (1)	3 (2)	-	1 (1)
Total (N)	602	313	149	19	107

Table 49: Confidence that written information provided when eating out allows the identification of foods that cause their child a bad or unpleasant physical reaction, by child's food hypersensitivity

Level of confidence in information provided	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly confident	390 (65)	201 (64)	110 (73)	10 (53)	64 (60)
Not very or not at all confident	148 (25)	79 (25)	24 (16)	6 (32)	34 (32)
Varies from place to place	53 (9)	31 (10)	11 (7)	3 (16)	8 (7)
Don't know	13 (2)	3 (1)	5 (3)	-	1 (1)
Total (N)	604	314	150	19	107

Table 50: Confidence that information provided verbally by staff when eating out allows the identification of foods that cause their child a bad or unpleasant physical reaction, by child's food hypersensitivity

Level of confidence in information provided verbally by staff	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly confident	335 (55)	158 (50)	108 (72)	5 (26)	60 (55)
Not very or not at all confident	206 (34)	118 (38)	31 (21)	9 (47)	44 (40)
Varies from place to place	55 (9)	35 (11)	8 (5)	5 (26)	4 (4)
Don't know	10 (2)	3 (1)	3 (2)	-	1 (1)
Total (N)	606	314	150	19	109

Table 51: Frequency that parent respondents report their child being served a food that they may react to in the last 12 months, despite reviewing available information, by child's hypersensitivity

Frequency of being offered allergens	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Once	139 (23)	78 (25)	28 (19)	5 (26)	26 (24)
Twice	87 (14)	35 (11)	22 (15)	-	26 (24)
Between 3- 6 times	58 (10)	15 (5)	14 (9)	2 (11)	24 (22)
Between 7 -10 times	8 (1)	3 (1)	-	2 (11)	3 (3)
More than 10 times	3 (1)	2 (1)	1 (1)	-	-
This hasn't happened in the last 12 months	309 (51)	181 (58)	84 (56)	10 (53)	29 (27)
Total	604	314	149	19	108

Table 52: Comparisons for parents taking part at both Wave 1 and Wave 2

Wave	All parents N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Wave 1	793	496 (50)	156 (20)	39 (5)	95 (12)
Wave 2	750	399 (53)	176 (23)	21 (3)	134 (18)
Both waves	77	51 (66)	7 (9)	8 (10)	9 (12)

Annex C – Children (8-17 years) with food hypersensitivities

Table 53: Ethnicity, by food hypersensitivity

Ethnicity	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
White British/Irish	300 (86)	118 (84)	123 (88)	28 (97)	15 (71)
Mixed/multiple ethnicity	18 (5)	7 (5)	7 (5)	1 (3)	2 (10)
Asian (Indian, Chinese, Bangladeshi, Pakistani) background	17 (5)	10 (7)	4 (3)	-	1 (5)
Black British/African/Caribbean	10 (3)	4 (3)	5 (4)	-	1 (5)
Arab	1 (*)	-	-	-	1 (5)
Other ethnic group	1 (*)	-	-	-	1 (5)
Total (N)	347	139	139	29	21

Table 54: Region by food hypersensitivity

Region	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Scotland	27 (8)	10 (7)	14 (10)	1 (3)	-
Northern Ireland	4 (1)	1 (1)	2 (1)	-	1 (5)
Wales	20 (6)	4 (3)	8 (6)	4 (14)	4 (19)
North East of England	14 (4)	5 (4)	4 (3)	2 (7)	1 (5)
North West of England	48 (14)	18 (3)	22 (16)	5 (17)	2 (10)

Region	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Yorkshire and the Humber	33 (9)	16 (11)	11 (8)	2 (7)	-
East of England	30 (9)	7 (5)	16 (12)	2 (7)	1 (5)
East Midlands	25 (7)	13 (9)	8 (6)	3 (10)	-
West Midlands	26 (7)	14 (10)	9 (6)	3 (10)	-
London	50 (14)	29 (21)	14 (10)	2 (7)	4 (19)
South West of England	24 (7)	11 (8)	8 (6)	2 (7)	2 (10)
South East of England	48 (14)	13 (9)	23 (17)	3 (10)	6 (29)
Total (N)	359	141	139	29	21

Table 55: All foods child respondents reacted to (no limit on numbers reported), by hypersensitivity

All foods reacted to	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Celery	30 (3)	7 (1)	7 (3)	5 (8)	10 (11)
Cereals containing gluten (wheat, rye, barley or oats)	72 (8)	17 (3)	28 (11)	18 (28)	6 (7)
Crustaceans (such as prawns, crabs, scampi or lobsters)	37 (4)	17 (3)	10 (4)	2 (3)	6 (7)
Eggs	81 (8)	32 (6)	25 (10)	11 (17)	9 (10)
Fish	43 (5)	22 (4)	6 (2)	2 (3)	10 (11)
Lupin	12 (1)	6 (1)	1 (*)	2 (3)	3 (3)
Milk	103 (11)	24 (5)	57 (22)	5 (8)	9 (10)
Molluscs (such as mussels, snails, squid, whelks, clams or oysters)	15 (2)	4 (1)	9 (4)	1 (2)	1 (1)
Mustard	17 (2)	5 (1)	3 (1)	3 (5)	4 (4)
Peanuts	71 (7)	57 (12)	12 (5)	-	1 (1)
Tree nuts: Almond	50 (5)	35 (7)	9 (4)	1 (2)	4 (4)
Tree nuts: Hazelnuts	47 (5)	34 (7)	4 (2)	2 (3)	6 (7)
Tree nuts: Brazil nuts	38 (4)	30 (6)	5 (2)	-	2 (2)
Tree nuts: Walnuts	40 (4)	31 (6)	4 (2)	2 (3)	2 (2)
Tree nuts: Cashew nuts	45 (5)	34 (7)	4 (2)	3 (5)	3 (3)
Tree nuts: Pecans	42 (4)	29 (6)	7 (3)	1 (2)	4 (4)
Tree nuts: Macadamia nuts	39 (4)	29 (6)	4 (2)	2 (3)	2 (2)
Tree nuts: Pistachios	43 (5)	31 (6)	7 (3)	-	4 (4)
Sesame seed	18 (2)	9 (2)	4 (2)	1 (2)	4 (4)
Soybeans	17 (2)	7 (1)	7 (3)	1 (2)	-
Sulphur dioxide	10 (1)	2 (*)	5 (2)	1 (2)	2 (2)
Fruit	38 (4)	21 (4)	13 (5)	-	-
Vegetables	20 (2)	7 (1)	10 (4)	1 (2)	-
Other	27 (3)	5 (1)	16 (6)	1 (2)	-
Total (N)	955	495	257	65	92

Table 56: All foods resulting in adverse reactions, by food hypersensitivity

Food resulting in adverse reaction	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
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Celery	15 (3)	-	4 (3)	4 (11)	2 (3)
Cereals containing gluten (wheat, rye, barley or oats)	50 (11)	5 (3)	25 (16)	16 (46)	4 (7)
Crustaceans (such as prawns, crabs, scampi or lobsters)	18 (4)	11 (7)	4 (3)	-	3 (5)
Eggs	42 (10)	17 (11)	18 (11)	2 (6)	4 (7)
Fish	34 (8)	19 (12)	7 (4)	2 (6)	5 (8)
Lupin	3 (1)	1 (1)	-	-	2 (3)
Milk	78 (18)	12 (8)	53 (33)	3 (9)	4 (7)
Molluscs (such as mussels, snails, squid, whelks, clams or oysters)	8 (2)	1 (1)	3 (2)	2 (6)	2 (3)
Mustard	4 (1)	1 (1)	1 (1)	1 (3)	1 (2)
Peanuts	52 (12)	45 (28)	7 (4)	-	-
Tree nuts	57 (13)	20 (13)	6 (4)	4 (11)	26 (43)
Sesame seed	8 (2)	2 (1)	-	-	6 (10)
Soy bean	6 (1)	3 (2)	2 (1)	-	-
Sulphur dioxide and sulphites	4 (1)	-	2 (1)	-	-
Fruit	30 (7)	16 (10)	12 (8)	-	-
Vegetables	5 (1)	2 (1)	3 (2)	-	-
Other	26 (6)	4 (3)	13 (8)	1 (3)	2 (3)
Total (N)	440	159	160	35	61

Table 57: All symptoms usually experienced for all foods, according to hypersensitivity group

Symptoms	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Breathing	640 (25)	315 (30)	147 (19)	50 (30)	113 (26)
Skin	586 (23)	288 (28)	149 (20)	41 (17)	96 (22)
Gastrointestinal	868 (34)	205 (20)	394 (52)	110 (45)	109 (25)
Mouth/throat/ear	299 (12)	162 (16)	48 (6)	22 (9)	63 (14)
Other	183 (7)	67 (6)	26 (3)	23 (9)	60 (14)
Total N	2576	1037	764	246	441

Table 58: Gastrointestinal symptoms experienced for all foods reported, according to hypersensitivity

Gastrointestinal symptoms reported	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Bloated stomach	128 (15)	21 (10)	74 (19)	15 (14)	8 (7)
Abdominal pain/stomach cramps	157 (18)	35 (17)	84 (21)	20 (18)	10 (9)
Heart burn	62 (7)	20 (10)	15 (4)	3 (3)	21 (19)
Sickness/vomiting	212 (24)	74 (36)	70 (18)	28 (25)	29 (27)
Diarrhoea	134 (15)	30 (15)	72 (18)	15 (14)	11 (10)
Blood in stool	19 (2)	2 (1)	2 (1)	5 (5)	9 (8)
Dehydration	22 (3)	5 (2)	3 (1)	5 (5)	8 (7)
Loss of weight/malnutrition	19 (2)	4 (2)	4 (1)	5 (5)	4 (4)
Excessive wind	55 (6)	7 (3)	36 (9)	5 (5)	5 (5)

Gastrointestinal symptoms reported	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Irritable bowel symptoms	60 (7)	7 (3)	34 (9)	9 (8)	4 (4)
Total (N)	868	205	394	110	109

Table 59: Breathing symptoms and anaphylaxis experienced for all foods reported, according to hypersensitivity

Breathing symptoms reported	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Cough/sneezing	85 (13)	45 (13)	12 (8)	4 (8)	21 (18)
Runny nose	99 (15)	31 (9)	27 (18)	11 (22)	23 (19)
Irritable/itchy nose	97 (15)	44 (13)	28 (19)	7 (14)	18 (15)
Congested nose	47 (7)	25 (7)	12 (8)	7 (14)	13 (11)
Wheezing	93 (14)	51 (15)	20 (13)	6 (12)	15 (13)
Tight chest	97 (15)	58 (17)	23 (15)	6 (12)	9 (8)
Breathless	85 (13)	47 (14)	19 (13)	6 (12)	10 (8)
Asthma	37 (6)	24 (7)	6 (4)	3 (5)	4 (3)
Anaphylaxis	28 (4)	18 (5)	3 (2)	1 (2)	6 (5)
Total (N)	668	343	150	51	119

Table 60: Most severe symptoms ever experienced for all foods, by hypersensitivity group

Most severe symptoms reported	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Breathing	457 (24)	191 (28)	100 (18)	44 (25)	108 (26)
Skin	421 (22)	201 (30)	104 (18)	29 (16)	82 (20)
Gastrointestinal	626 (33)	137 (20)	289 (51)	64 (36)	108 (26)
Mouth/throat/ear	232 (12)	99 (15)	49 (9)	18 (10)	54 (13)
Other	168 (9)	49 (7)	26 (5)	23 (313)	67 (16)
Total (N)	1895	677	568	178	519

Table 61: Time period in which symptoms usually start, by hypersensitivity

Time symptoms usually start after eating the reported food	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Less than 5 mins	102 (23)	53 (34)	32 (20)	2 (6)	12 (20)
5 to 30 mins	178 (41)	75 (48)	64 (40)	11 (31)	18 (30)
30 mins to 1 hour	80 (18)	16 (10)	35 (22)	10 (29)	14 (23)
1 to 2 hours	37 (9)	4 (3)	13 (8)	9 (26)	8 (13)
More than 2 hours	27 (6)	3 (2)	12 (8)	1 (3)	7 (11)
Don't know	11 (3)	4 (3)	3 (2)	2 (6)	2 (3)
Total N	435	155	159	35	61

Table 62: Diagnosis method, by hypersensitivity

Diagnosis method	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
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Healthcare professional's diagnosis	82 (15)	38 (19)	25 (13)	8 (17)	10 (15)
Skin prick test	77 (14)	44 (22)	15 (8)	4 (9)	12 (18)
Blood test	86 (16)	34 (17)	14 (7)	18 (39)	18 (26)
Food challenge	44 (8)	16 (8)	17 (9)	3 (7)	6 (9)
No formally diagnosed but noticed symptoms themselves	111 (21)	25 (12)	62 (31)	3 (7)	14 (21)
Caregiver told me I reacted to it	105 (20)	35 (17)	54 (27)	4 (9)	7 (10)
Don't know/can't remember	21 (4)	7 (3)	8 (4)	1 (2)	1 (1)
Other	11 (2)	3 (1)	2 (1)	5 (11)	-
Total (N)	537	202	197	46	68

Table 63: Frequency of reactions to all foods in the previous 12 months

Frequency of reactions	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Once	88 (21)	34 (22)	20 (13)	5 (15)	24 (41)
Twice	107 (25)	44 (28)	31 (20)	9 (27)	17 (29)
Between 3 and 6 times	82 (19)	19 (12)	42 (27)	9 (27)	9 (15)
Between 7 and 10 times	23 (5)	5 (3)	10 (6)	5 (15)	3 (5)
More than 10 times	41 (10)	9 (6)	25 (16)	3 (9)	1 (2)
I haven't reacted to this food in the last year	72 (17)	41 (26)	22 (14)	1 (3)	3 (5)
Don't know	16 (4)	3 (2)	7 (4)	1 (3)	2 (3)
Total (N)	429	155	157	33	59

Table 64: Where children reported experiencing their most recent adverse reaction, by hypersensitivity

Where reaction occurred	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Home	237 (58)	76 (51)	117 (76)	16 (52)	15 (28)
School	63 (15)	33 (22)	10 (7)	7 (23)	9 (17)
Work	11 (3)	3 (2)	1 (1)	1 (3)	6 (11)
Family and friends house	52 (13)	16 (11)	12 (8)	4 (13)	17 (31)
Public transport	8 (2)	2 (1)	1 (1)	1 (3)	4 (7)
Eating out	24 (6)	12 (8)	10 (7)	1 (3)	1 (2)
Other	7 (2)	4 (3)	-	-	2 (4)
Can't remember	9 (2)	3 (2)	2 (1)	1 (3)	-
Total (N)	411	149	153	31	54

Table 65: Who treated childrens' reactions across hypersensitivities

Who treated reaction	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
I treated the reaction myself	166 (36)	52 (31)	72 (44)	12 (30)	15 (22)
I had medical help for the reaction	115 (25)	51 (31)	18 (11)	11 (28)	32 (47)

Who treated reaction	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Someone else helped me to treat the reaction	143 (31)	49 (29)	61 (38)	11 (28)	16 (24)
I have not reacted to this food before	14 (3)	4 (2)	3 (2)	3 (8)	4 (6)
Can't remember	25 (5)	11 (7)	8 (5)	3 (8)	1 (1)
Total	463	167	162	40	68

Table 66: Experience of anaphylaxis, across all foods reported by children

Experience of anaphylaxis	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	145 (35)	62 (41)	22 (14)	9 (28)	45 (28)
No	234 (56)	72 (48)	120 (78)	21 (66)	6 (11)
Not sure	38 (9)	16 (11)	12 (8)	2 (6)	5 (9)
Total (N)	417	150	154	32	56

Table 67: Experience of anaphylaxis in the last 12 months, across all foods reported by children

Experience of anaphylaxis in the last 12 months	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	98 (24)	32 (22)	16 (11)	9 (29)	35 (64)
No	285 (71)	107 (74)	126 (85)	20 (65)	17 (31)
Not sure	19 (5)	5 (3)	6 (4)	2 (6)	3 (5)
Total (N)	402	144	148	31	55

Table 68: Frequency of emergency hospital admissions because of an adverse reaction, reported by children

Frequency of admission for those admitted to hospital	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Haven't been admitted in the last 12 months	33 (23)	22 (37)	6 (22)	3 (30)	2 (5)
Once	44 (30)	18 (31)	7 (26)	3 (30)	12 (29)
Twice	32 (22)	10 (17)	7 (26)	2 (20)	11 (26)
Between 3 and 6 times	17 (12)	2 (3)	4 (15)	2 (20)	9 (21)
Between 7 and 10 times	9 (6)	1 (2)	1 (4)	-	7 (17)
More than 10 times	5 (3)	3 (5)	1 (4)	-	1 (2)
Don't know	5 (3)	3 (5)	1 (4)	-	-
Total (N)	145	59	27	10	42

Table 69: Admission to hospital for a child's first time reaction to a food

Admission to hospital for first reaction to food	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple food hypersensitivities N (%)
Yes	120 (86)	50 (86)	24 (92)	7 (70)	33 (85)
No	20 (14)	8 (14)	2 (8)	3 (30)	6 (15)
Total (N)	140	58	26	10	39

Table 70: Frequency of eating out or getting food to take away from a restaurant or other food outlet, by hypersensitivity

Frequency	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
At least once a day	10 (3)	4 (3)	2 (1)	1 (3)	3 (16)
5-6 times a week	15 (4)	5 (4)	3 (2)	-	5 (26)
3-4 times a week	33 (10)	17 (13)	8 (6)	2 (7)	6 (32)
Once or twice a week	82 (24)	36 (26)	34 (25)	8 (28)	-
Once a fortnight	51 (15)	16 (12)	21 (16)	8 (28)	4 (21)
Once a month	65 (19)	24(18)	35 (26)	3 (10)	1 (5)
Less than once a month	60 (18)	26 (19)	22 (16)	7 (24)	-
Never	16 (5)	6 (4)	7 (5)	-	-
Don't know	6 (2)	2 (1)	3 (2)	-	-
Total (N)	338	136	135	29	19

Table 71: How comfortable child respondents feel asking a member of staff for information about the food they are selling when eating out, by food hypersensitivity

Level of comfort asking for information	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly comfortable	179 (56)	84 (65)	63 (50)	16 (57)	9 (50)
Not very or not at all comfortable	89 (28)	31 (24)	36 (29)	6 (21)	7 (39)
Varies from place to place	26 (8)	7 (5)	15 (12)	1 (4)	2 (11)
Don't know	23 (7)	8 (6)	11 (9)	2 (7)	-
Total (N)	317	130	125	28	28

Table 72: Confidence that written information provided when eating out allows identification of foods that cause a bad or unpleasant physical reaction, by food hypersensitivity

Level of confidence in information provided	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly confident	198 (63)	85 (66)	77 (61)	17 (63)	8 (44)
Not very or not at all confident	75 (24)	29 (23)	29 (23)	7 (26)	8 (44)
Varies from place to place	19 (6)	6 (5)	10 (8)	-	2 (11)
Don't know	24 (8)	9 (7)	10 (8)	3 (11)	-
Total (N)	316	129	126	27	18

Table 73: Confidence that information provided verbally by staff when eating out allows identification of foods that cause a bad or unpleasant physical reaction, by hypersensitivity

Level of confidence in information provided	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Very or fairly confident	188 (59)	88 (67)	66 (52)	16 (57)	10 (56)

Level of confidence in information provided	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Not very or not at all confident	75 (24)	24 (19)	33 (26)	8 (29)	8 (45)
Varies from place to place	25 (8)	8 (6)	15 (12)	1 (4)	-
Don't know	30 (9)	11 (9)	13 (10)	3 (11)	-
Total (N)	318	129	127	28	18

Table 74: Frequency of children respondents being offered a food in the last 12 months, which may result in an adverse reaction, despite checking the available information

Frequency of being offered food	All children N (%)	Food allergy N (%)	Food intolerance N (%)	Coeliac disease N (%)	Multiple hypersensitivities N (%)
Once	65 (20)	24 (18)	24 (19)	10 (34)	5 (28)
Twice	46 (14)	20 (15)	13 (10)	3 (10)	8 (44)
Between 3- 6 times	28 (9)	8 (6)	12 (10)	4 (14)	2 (11)
Between 7 -10 times	8 (3)	2 (2)	1 (1)	3 (10)	2 (11)
More than 10 times	3 (1)	2 (2)	-	1 (3)	-
This hasn't happened in the last 12 months	169 (53)	74 (57)	76 (60)	8 (28)	1 (6)
Total	319	130	126	29	18

Table 75: Summary of significant predictors of Quality of Life for each FH-specific group (only the models with significant predictors)

Predictor	Adult with FA	Adult with FI	Adult with CD	Parent-proxy for teen with FA	Child with FA	Teen with FA	Child with FI
Long-term condition	P	P					
Physical and mental health condition	P	P					
Asthma	P						
Eczema	P						
Greater number of foods	sP, 2	P	P, 2				
Greater severity	P, 2	P, 2	P	sP, 2	P	sP, 2	P
Prescribed an AAI	P			P			
Anaphylaxis	P			P			
Hospital admission	P						
Reaction to food in last 12 months		P					
Frequency of eating out	P				P		
Frequency of checking information before choosing where to eat	P,2	P,2	P,2	P		P	sP, 2
Frequency of checking information before ordering	P	P, 2					
Frequency of asking staff for information	P, 2	sP, 2		P		P	

Predictor	Adult with FA	Adult with FI	Adult with CD	Parent-proxy for teen with FA	Child with FA	Teen with FA	Child with FI
Being served a dish containing an allergen that participants may have a reaction to in the last 12 months	P, 2	P	P, 2				
Comfort in asking staff for information	P	P, 1	sP, 1				P
Confidence in written information	P		P, 1				
Confidence in verbal information	P	P	P		sP, 1		

- P = predictor
- sP = strongest predictor
- 1 = Better QoL
- 2 = Worse QoL