

# Preventing Allergies in Practice

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## Faculty Disclosure

<input checked="" type="checkbox"/>	Nothing to disclose
<input type="checkbox"/>	Yes, as follows:

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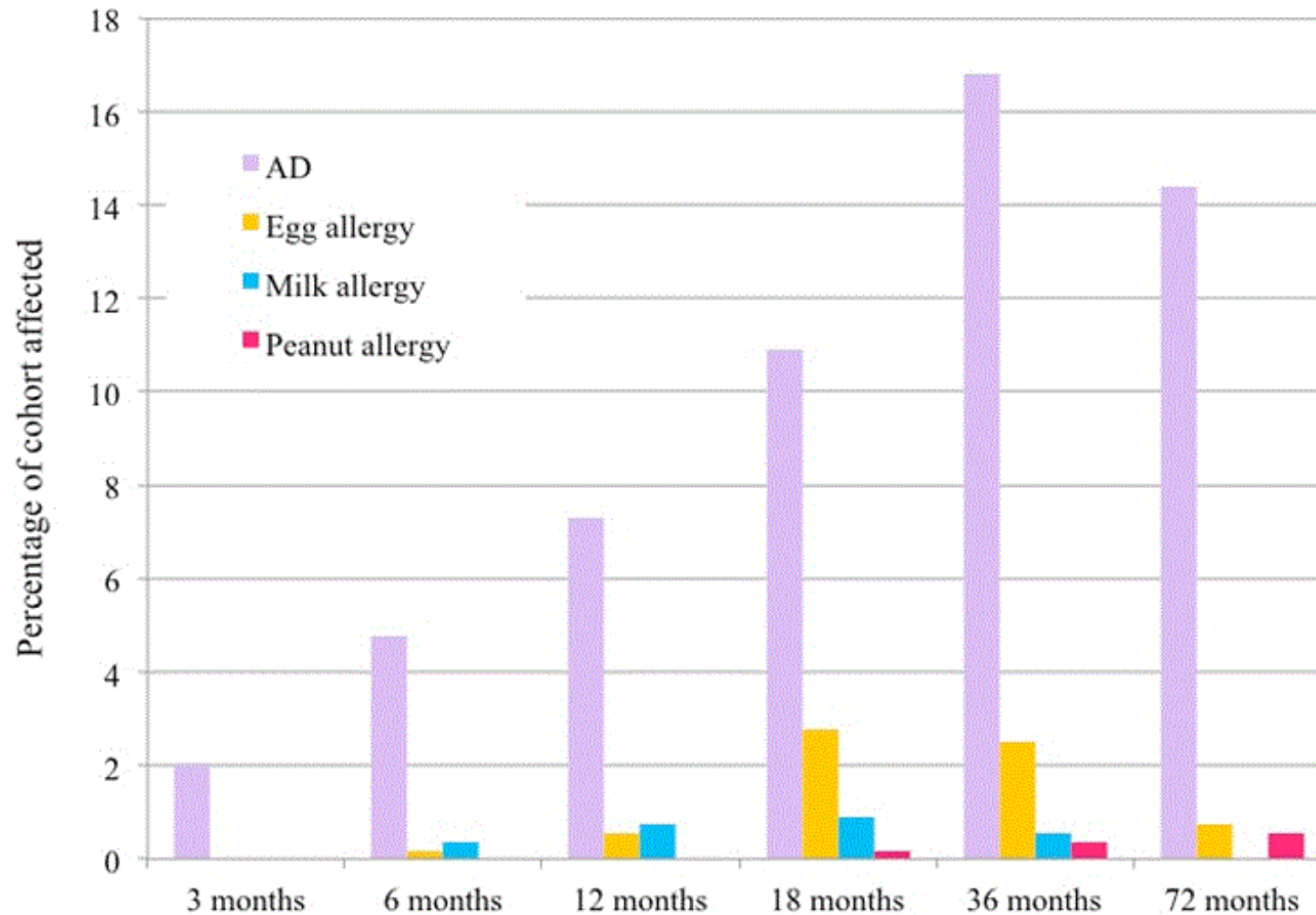
## Off-Label Product Use

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<input type="checkbox"/>	No
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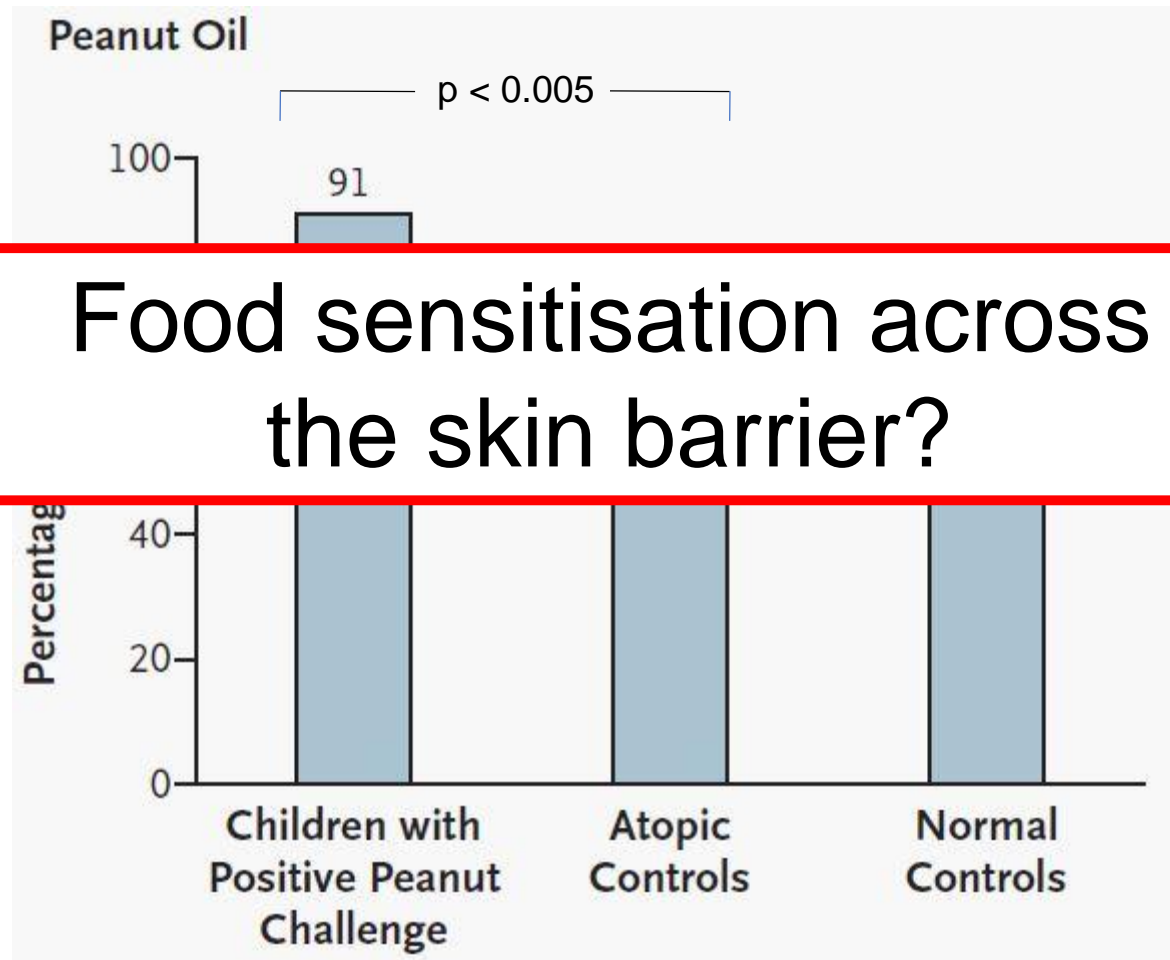
# Key Points

- Why do babies develop food allergy?
- Regular consumption of peanut can prevent peanut allergy
- Prioritising peanut
- Eczema as a target group
- Pathway
- Intervention
- Assessing a pathway for babies

# Which comes first, eczema *or* food allergy?

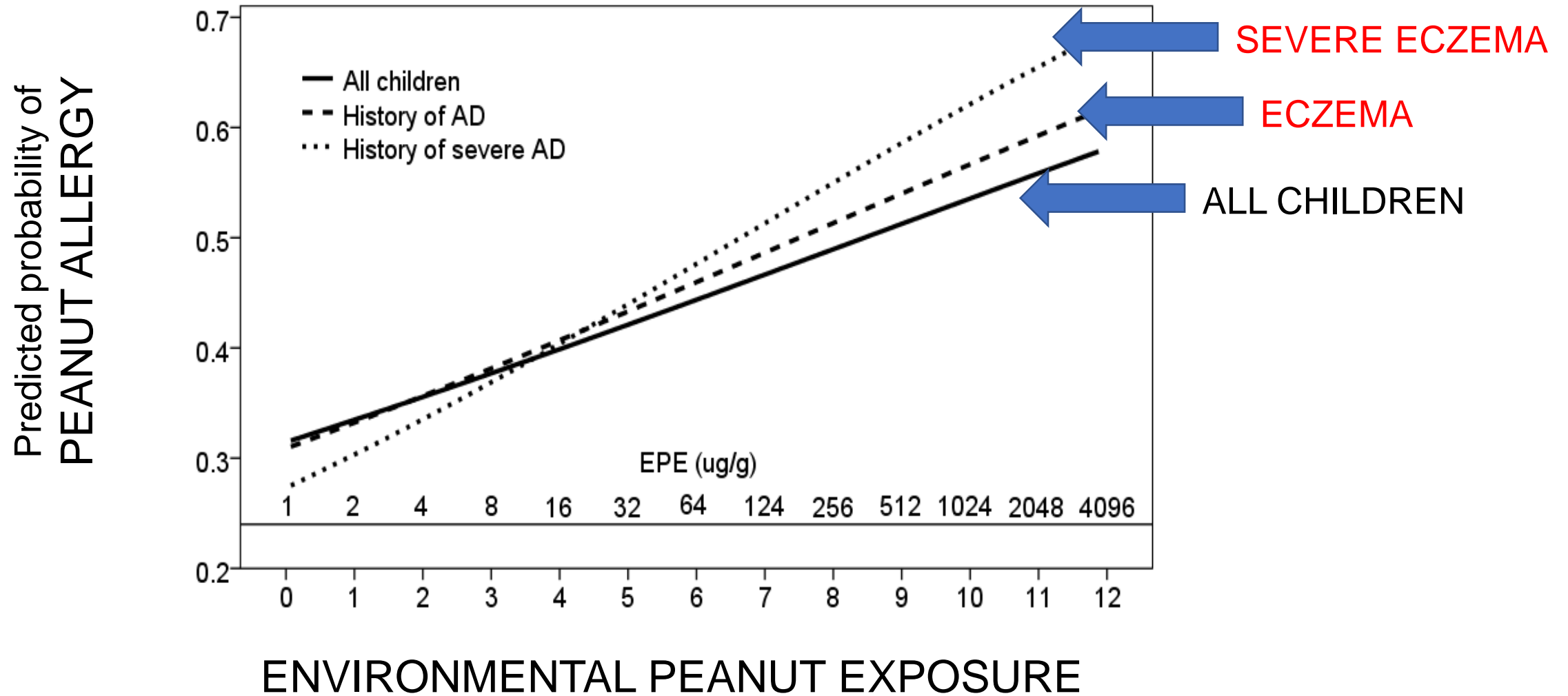


# Arachis oil-based cream use ↑ in infants who develop peanut allergy



Food sensitisation across the skin barrier?

# Environmental peanut dust predicts allergy, especially amongst eczema



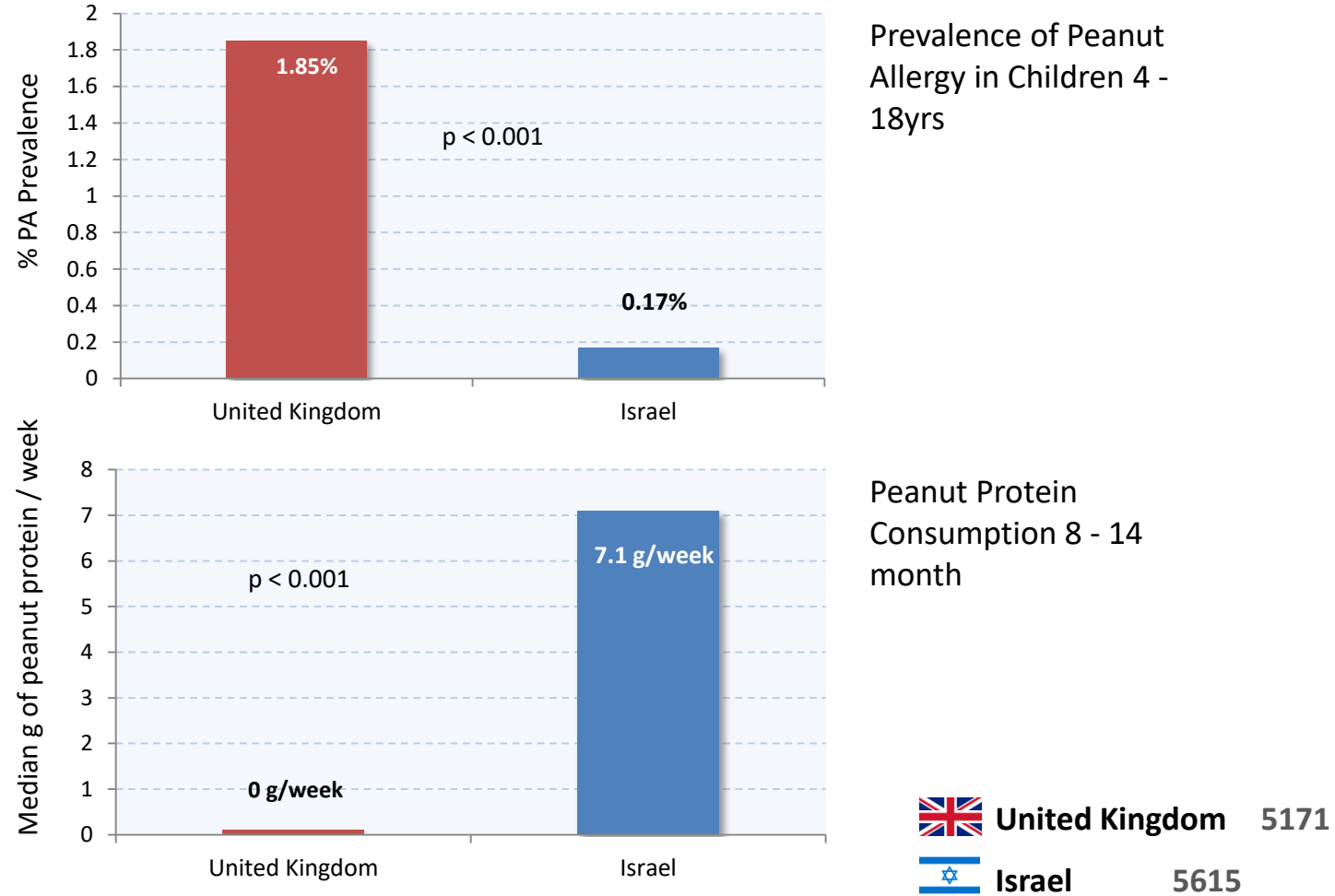
# Early consumption of peanuts in infancy is associated with a low prevalence of peanut allergy



## Methods

- **5171** Jewish school children in UK and **5615** Jewish school children in Israel were compared for food allergies and atopy.
- Questionnaire based assessment of peanut allergy validated by challenges.
- Infant weaning for peanut and other foods was determined in infants using a validated FFQ.

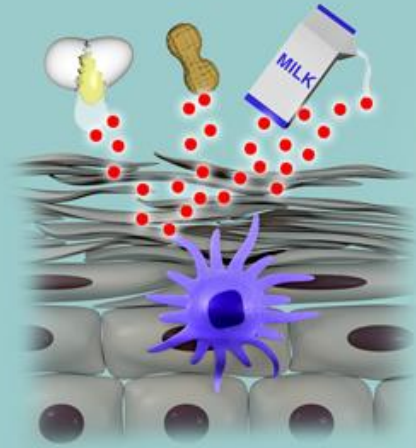
# Early consumption of peanuts in infancy is associated with a low prevalence of peanut allergy



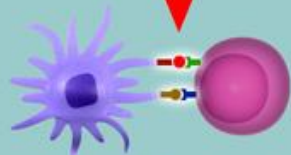


# DUAL ALLERGEN EXPOSURE HYPOTHESIS

## CUTANEOUS EXPOSURE



Skin



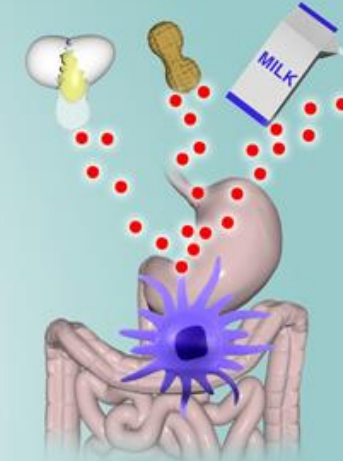
Skin-draining lymph nodes



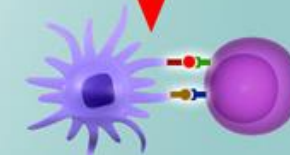
Th2 memory

**ALLERGY**

## ORAL EXPOSURE



GI Track

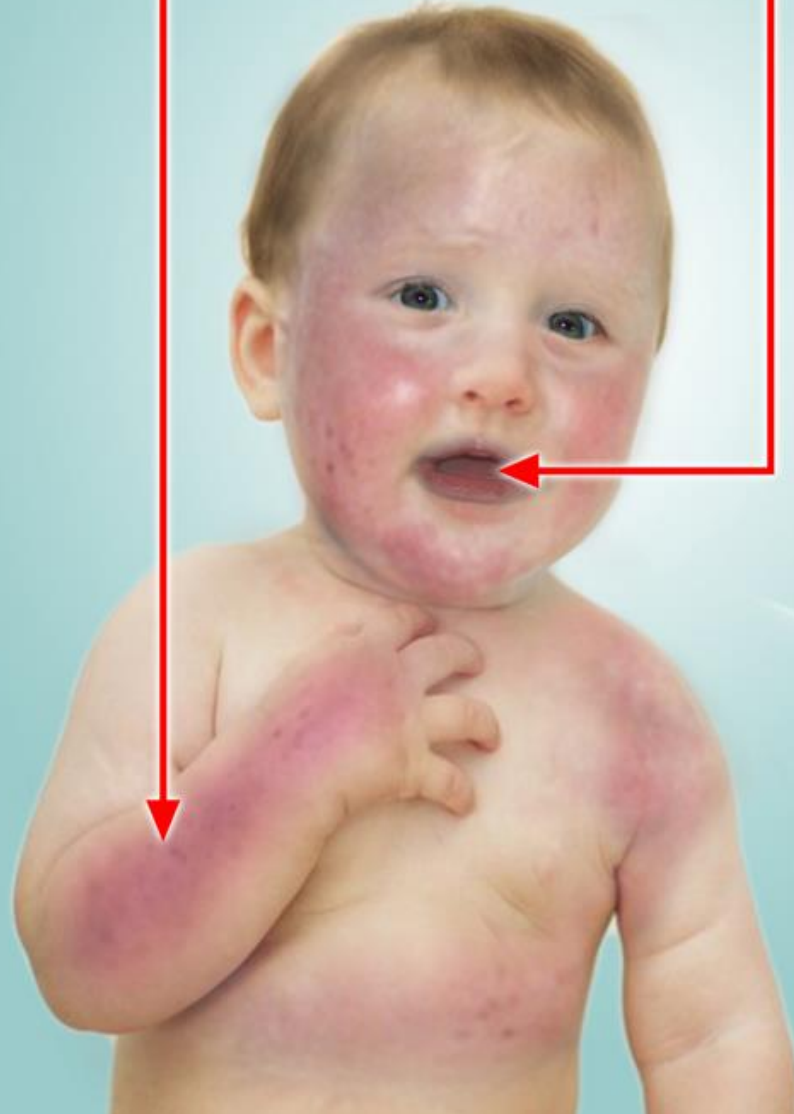


Mesenteric lymph nodes

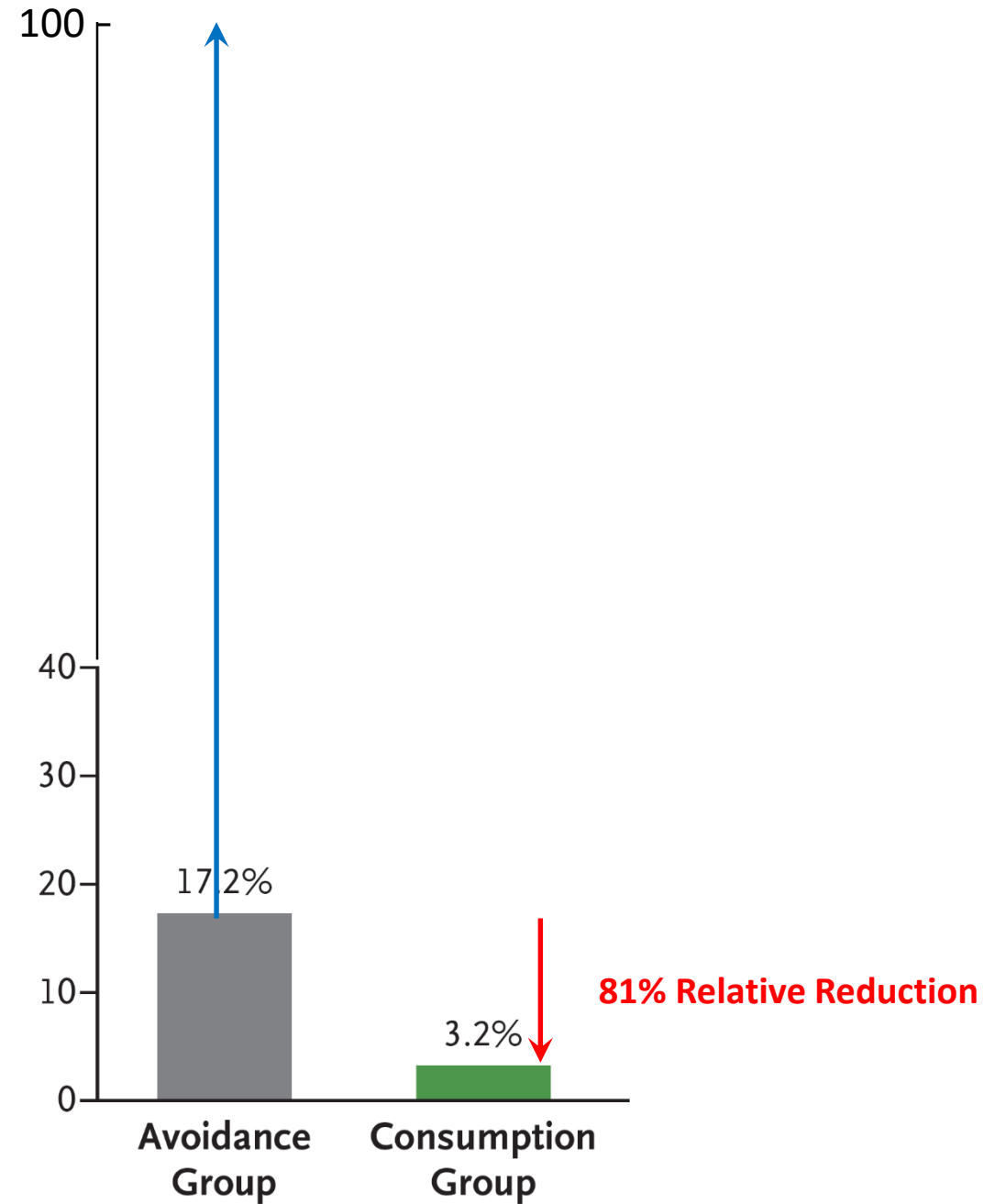
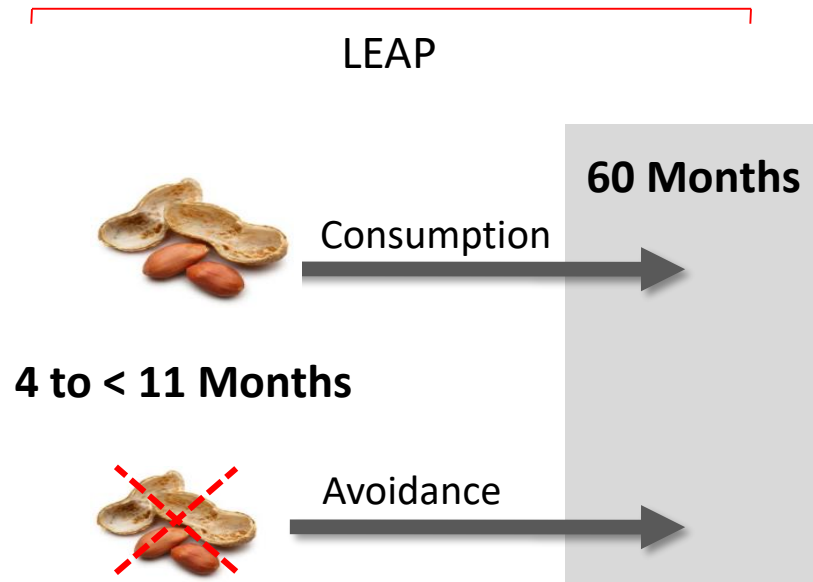


Th1 memory Treg memory

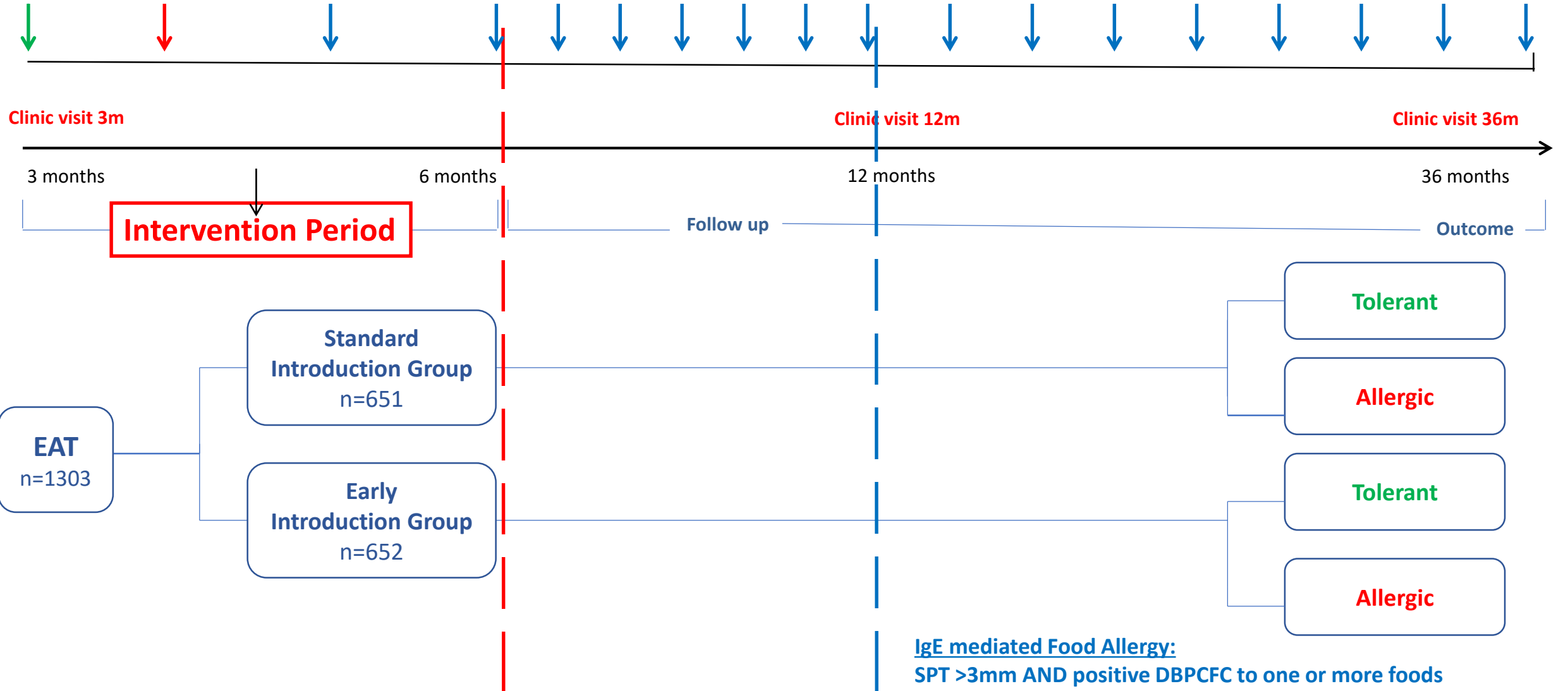
**TOLERANCE**



# LEAP Study



# EAT design



# Per-protocol Adherence: Individual Foods

Food	Total weekly Guideline Amount (2g allergen protein twice weekly)	% per-protocol adherent* (3g allergen protein per week)
Milk	2 small pots (40-60g) of yoghurt	85.2
Peanut	3 rounded teaspoons peanut butter	61.9
Fish	2 x fish fingers or ¼ fish fillet (25g)	60.0
Sesame	3 teaspoons tahini paste	52.3
Egg	1 small egg	43.1
Wheat	2 wheat based biscuit cereal	39.1

**\*Consumed 75% of total weekly amount**



# Baseline EAT @3 months; similar to your clinic?

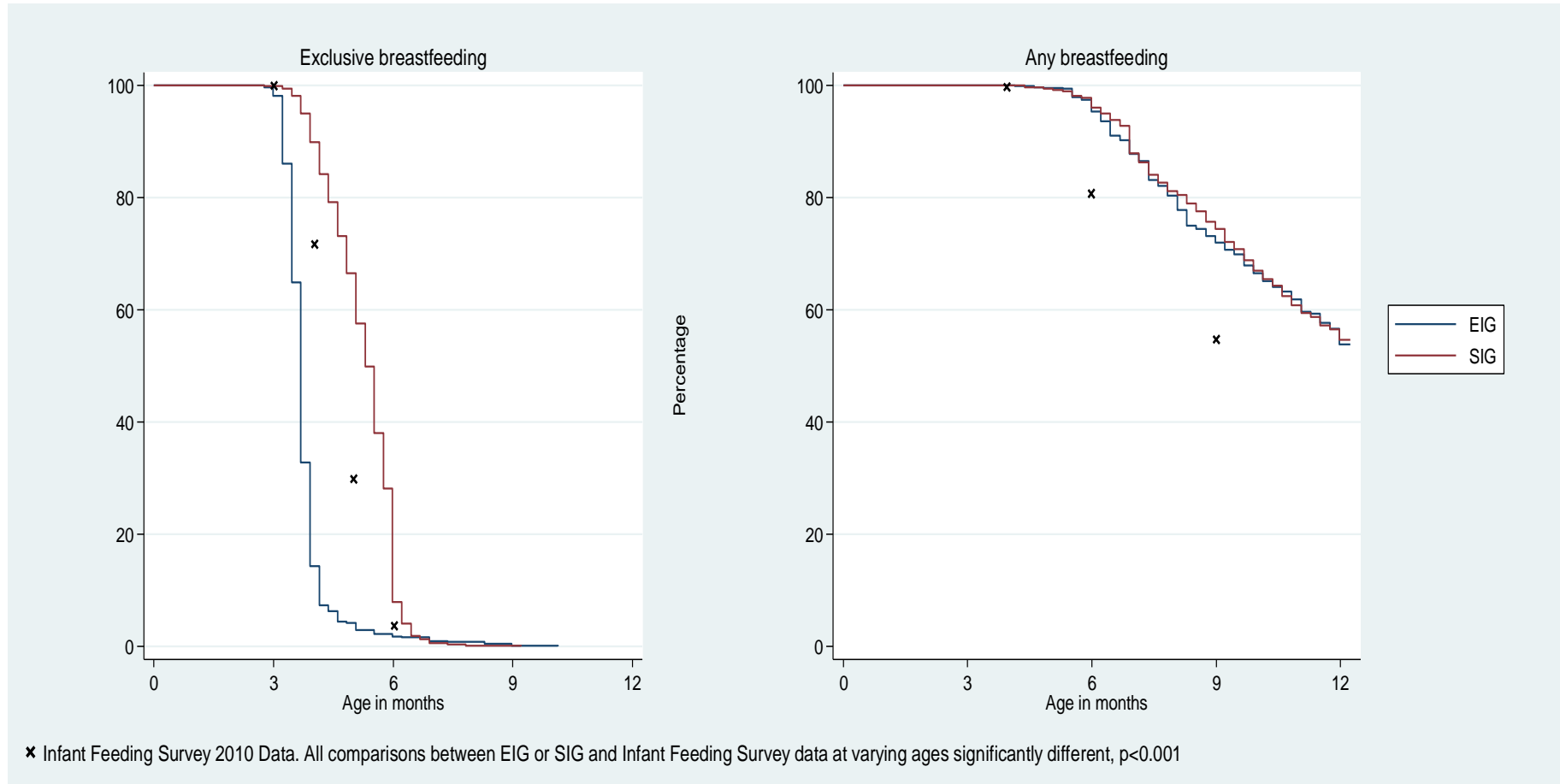
- Visible eczema 24.4%
- Parental history of atopy (any eczema, asthma or hay fever) 81.9%
- Prevalence of SPT >0 mm 5.1% (33/652);
  - Nine children sensitized to cow's milk (SPT range, 2.5-7 mm)
  - 9 to peanut (SPT range 1-4 mm)
  - 24 to (raw) egg (SPT range, 1.75-16 mm)
  - none to sesame
  - 1 to cod (SPT range, 2.75 mm)
  - 2 to wheat (SPT range 1.5-2.25 mm)
- Eight children were sensitized to 2 or more foods

# Seven IDs Challenge +ve Food Allergy at Enrolment

ID	Food	FC symptoms	FC treatment	Reaction dose
1	Egg	Itchy rash	Antihistamines	Egg - dose 1 (0.1g)
2	Milk	≥3 hives	No treatment	Milk - dose 1 (0.1g)
3	Peanut	Rash, ≥3 hives and scratching	Antihistamines	Peanut - dose 1 (0.1g)
3	Milk	≥3 hives	No treatment	Milk - dose 1 (0.1g)
4	Egg	Mild abdominal pain*	No treatment	Egg - safety dose 1 (0.01g)
4	Milk	≥3 hives	No treatment	Milk - dose 1 (0.1g)
5	Egg	≥3 hives	No treatment	Egg - dose 1 (0.1g)
6	Peanut	Vomiting and scratching	No treatment	Peanut - dose 4 (1.2g)
6	Milk	≥3 hives	Antihistamines	Milk - dose 3 (0.5g)
7	Wheat	≥3 hives	Antihistamines	Wheat - dose 1 (0.1g)

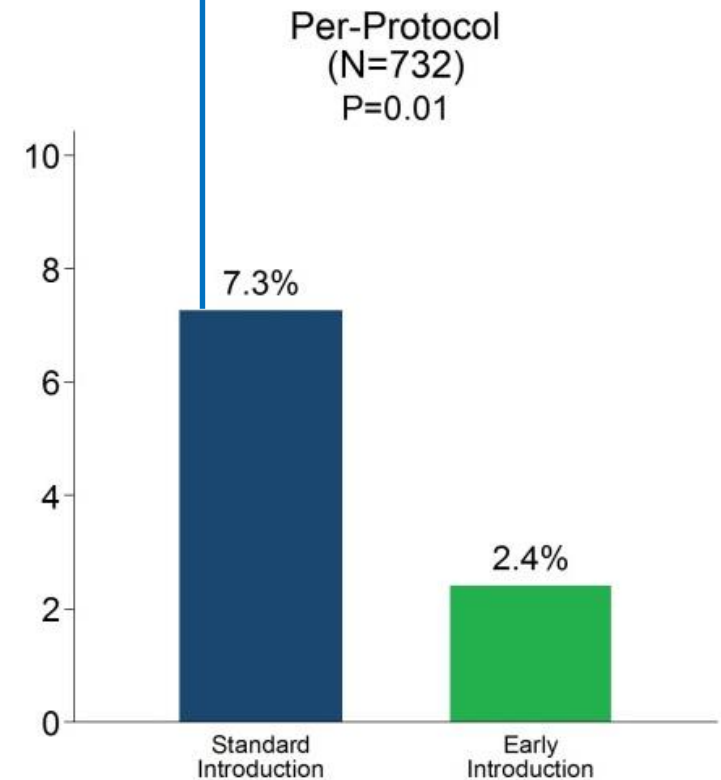
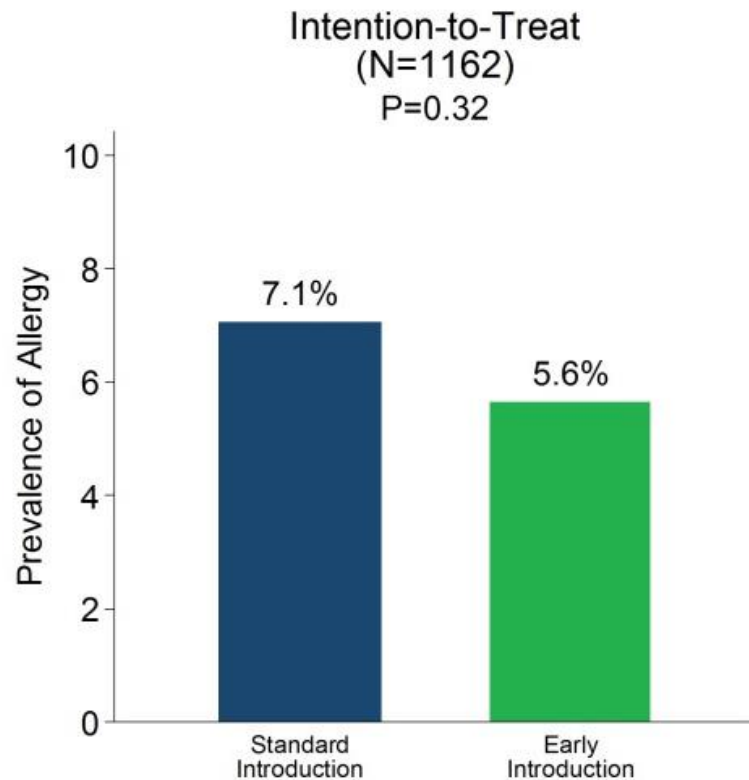
\*Indeterminate result: refused to return for repeat challenge

# EAT Study Breastfeeding Rates Between Groups



Perkin M, Logan K et al. Enquiring about tolerance (EAT) study: Feasibility of an allergenic food introduction regimen. 2016 JACI

# EAT RESULTS: Prevalence of Allergy to One or More Foods

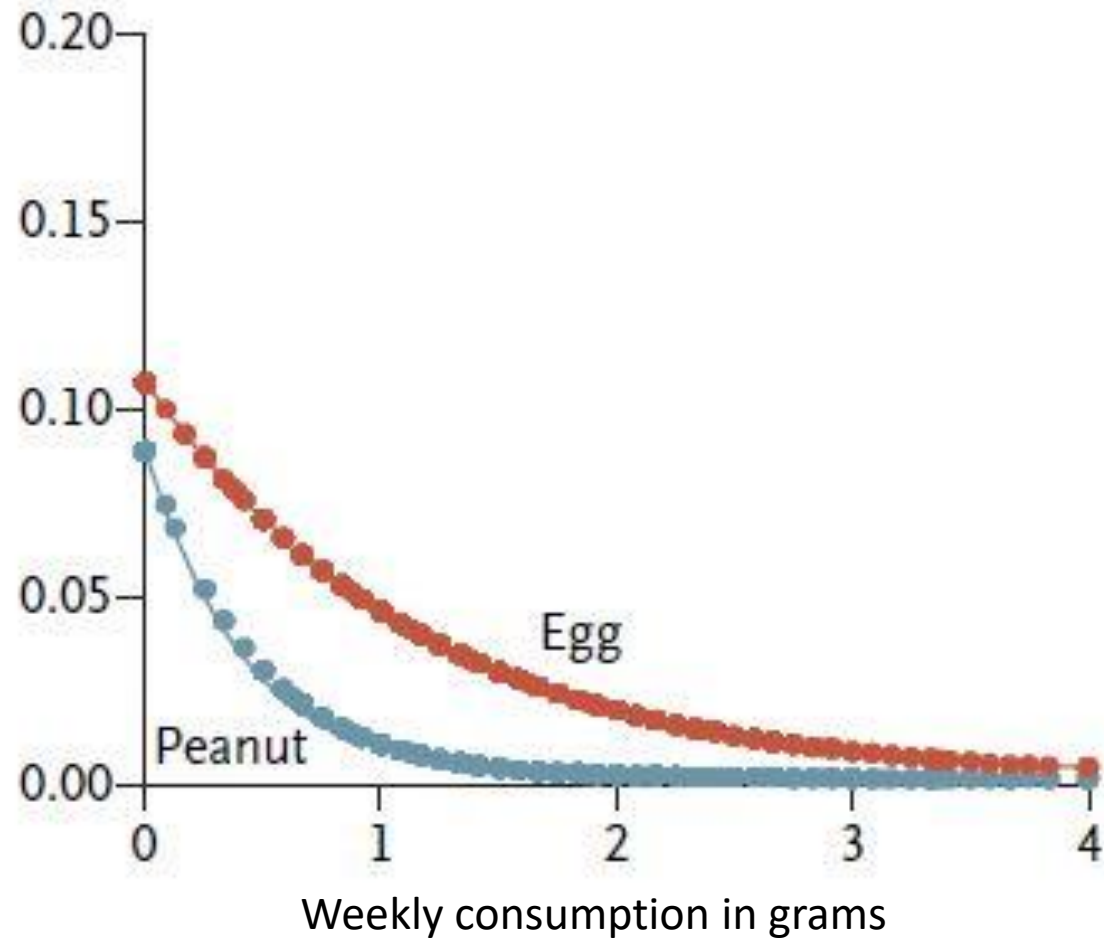


Intention to treat; 20% Non-signif drop

Per Protocol - 67% Significant drop



Eating more peanut protects more against peanut allergy  
Eating more egg protects more against egg allergy



# EAT Risk Factors for allergy & poor consumption

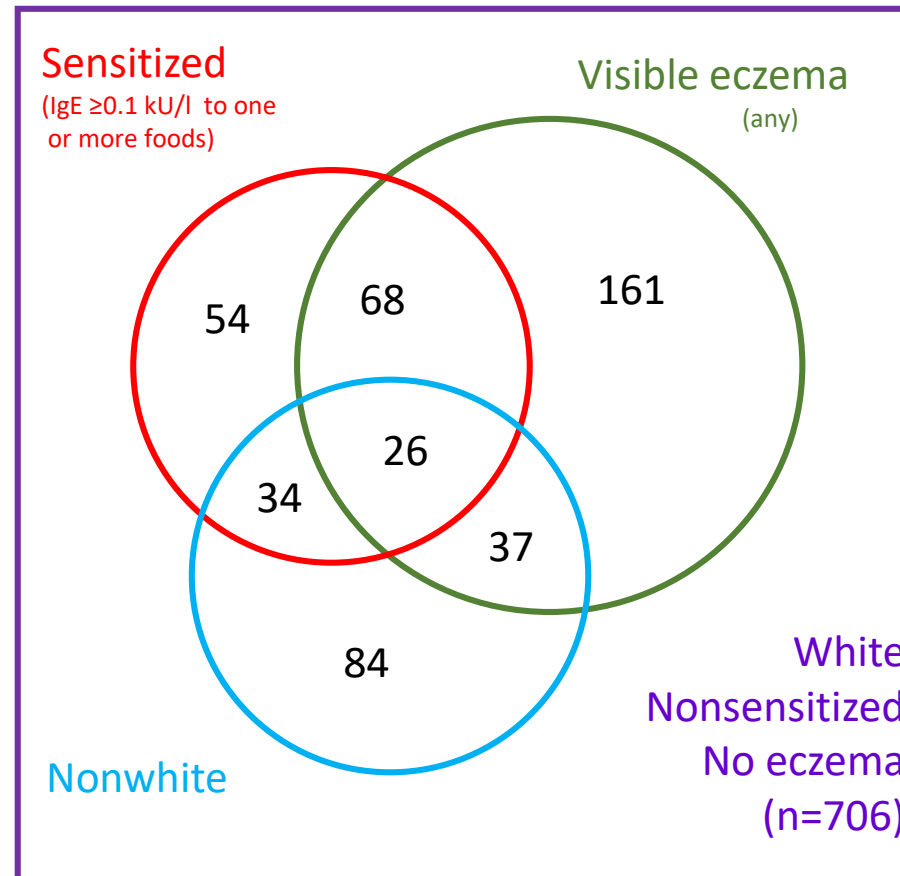
**Table S5. Logistic Modelling and Dominance Analysis of Factors Influencing the Primary Outcome**

	Primary outcome 6.4% (74/1161)		Primary outcome dominance analysis	
	OR (95% CI)	p value	Dominance statistic	Rank
Study group (early-introduction group)	0.75 (0.46-1.24)	0.26	1.5%	6
Ethnicity (non-white)	2.09 (1.19-3.66)	0.01	11.3%	2
Visible eczema at 3m visit	6.09 (3.67-10.1)	<0.001	72.4%	1
Maternal atopy	1.49 (0.86-2.59)	0.15	3.4%	4
Maternal education (≤18 years)	0.58 (0.28-1.23)	0.16	2.7%	5
Siblings (any)	1.95 (1.11-3.42)	0.02	8.9%	3

**Table S14. Logistic Modelling and Dominance Analysis of Factors Influencing Early-Introduction Group Non-Adherence**

	EIG non-adherence 56.6% (286/505)		EIG dominance analysis	
	OR (95% CI)	p value	Dominance statistic	Rank
Ethnicity (non-white)	2.21 (1.18-4.14)	0.01	27.4%	1
Visible eczema at 3m visit	1.38 (0.87-2.19)	0.18	10.9%	4
New onset eczema (4-6m)	1.35 (0.75-2.41)	0.32	3.8%	7
Maternal atopy	1.23 (0.84-1.79)	0.29	5.1%	5
Maternal education (≤18 years)	1.12 (0.68-1.83)	0.66	0.5%	13
Maternal smoking	0.78 (0.27-2.28)	0.65	1.4%	11
Caesarean delivery	1.21 (0.80-1.83)	0.38	3.9%	6
Sex (female)	1.21 (0.84-1.75)	0.39	3.3%	8
Siblings (any)	1.10 (0.76-1.61)	0.70	1.6%	10
QOL psychological domain (>median)	0.69 (0.47-1.00)	0.05	17.8%	3
Skin-prick test positive at 3m visit	1.01 (0.39-2.60)	0.98	0.6%	12
Any symptoms to EIG foods(4-6m)	1.70 (1.02-2.86)	0.04	22.2%	2
Any symptoms to other foods (4-6m)	1.34 (0.53-3.35)	0.54	1.7%	9

# Efficacy of the EAT study among infants at high risk of developing food allergy



Distribution of enrolment  
(3 months of age) risk factors  
(n=1170)

**Visible eczema:**  
(moderate SCORAD 15 to <40)

- EIG 22.6% versus SIG 46.7% developed any food allergy\*
- EIG 16.1% versus SIG 43.3% developed an egg allergy\*

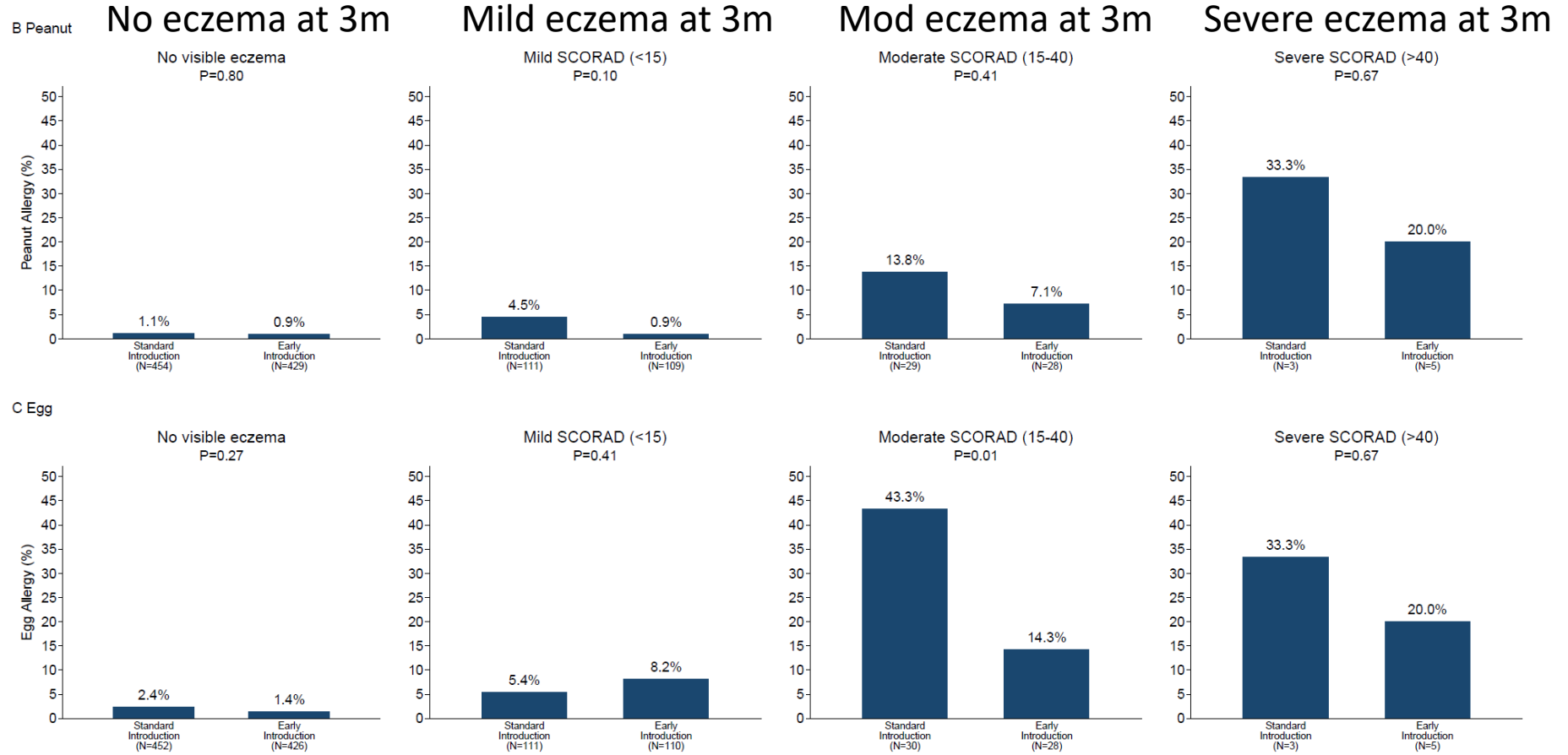
\*p<0.05

EIG: Early Introduction Group  
SIG: Standard Introduction Group

**Peanut allergy**

Efficacy of EAT according to eczema

**Egg allergy**

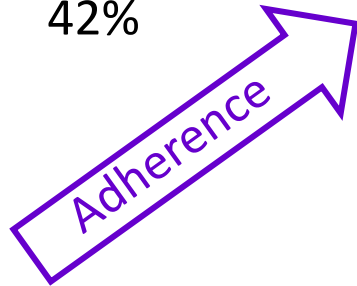


# Factors influencing adherence in a trial of early introduction of allergenic food

**EAT**  
Enquiring About Tolerance



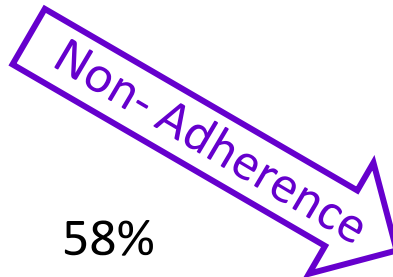
42%



Enrollment factors:

- Older maternal age
- Non-white ethnicity
- Lower maternal quality of life

58%



Post-Enrollment factors:

- Parent reported IgE type symptoms
- Early reported feeding difficulties

Unrelated to adherence

- Enrollment eczema
- Enrollment sensitization



# Challenges experienced with the early introduction and sustained consumption of allergenic foods in the EAT study: a qualitative analysis

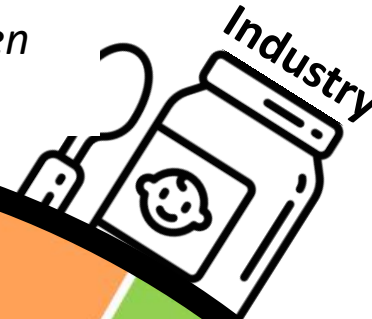
## Practice

*My baby seems to get very constipated when he eats egg, so I have not been giving him the guideline amounts*

*Very difficult to get egg white into smooth consistency*

## Policy

*Becoming fussy with food. Struggling to get food into her, both intervention foods and others. No 2 days are the same at present*



## Theme 2:

### Concerns about Reactions

*My baby has developed eczema and ? rattling noise when breathing is wheezing or to do with a cold*

*My only worry is that I might be feeding my baby too much food and he is not having much milk as a result*

## Theme 1: Infant Refusal



*Baby ill with chest infection and then stomach bug, consequently he had a very low appetite*

## Theme 3: Practical Problems





To eat  
or not to eat...

# Number Needed to Treat

$$\text{Number Needed to Treat} = \frac{1}{(\text{Untreated incidence} - \text{treated incidence})}$$

~~EAT~~

$$\text{Number Needed to Treat} = \frac{1}{(\text{Untreated is } 2.8\% - \text{treated } 0.2\%)} = 42$$

~~LEAP~~

$$\text{Number Needed to Treat} = \frac{1}{(\text{Untreated is } 17.2\% - \text{treated is } 3.2\%)} = 7$$



Efficacy of EAT according to eczema

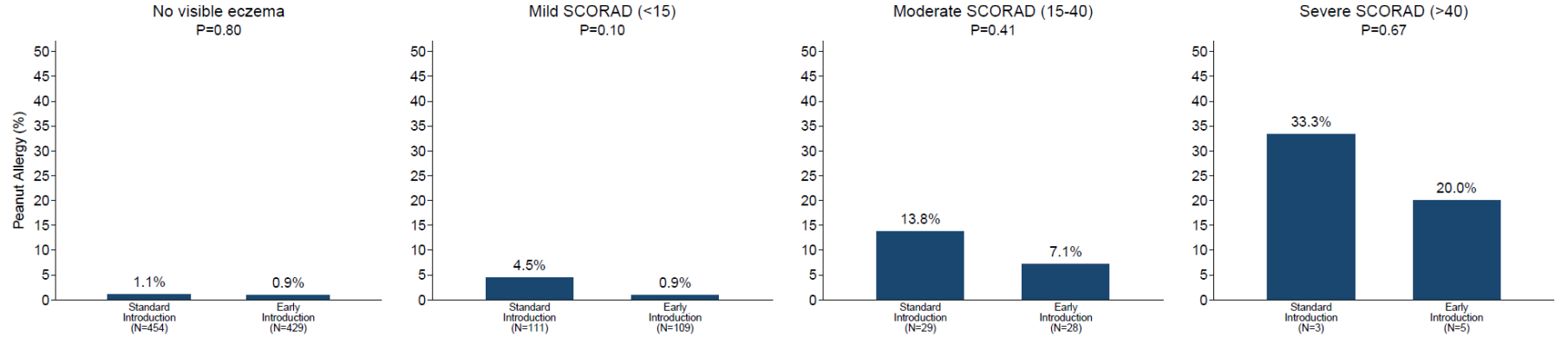
Peanut allergy

No eczema at 3m

Mild eczema at 3m

Mod eczema at 3m

Severe eczema at 3m



NNT -- 500

27.8

15

7.5

Incidence PA treated -- 0.9%

0.9%

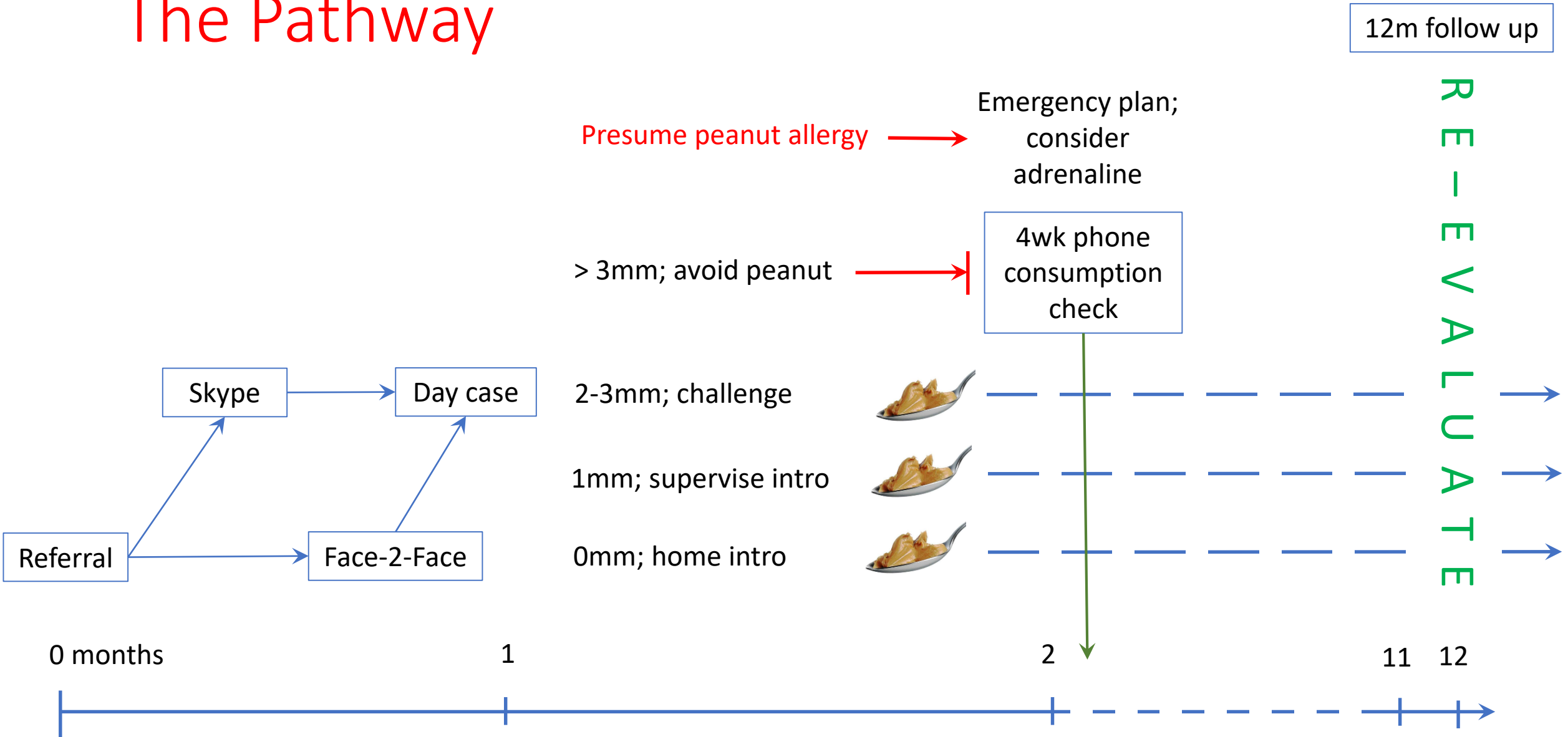
7.1%

20.0%

# How should a pathway for babies be designed?

- Age group; any baby under 1 year
- Access; ensure multiple referral and access points
- Timing; quick first appointment and reassess SPT if older than 7 days
- Assessment; SPT peanut and peanut butter, validated eczema exam
- Intervention; LEAP
- Support; written, verbal, reference, email and phone information
- Follow up; 4 weeks and 1 year
- Outcomes; continued consumption
- Key performance indicators; target babies, uptake, consumption, % oral tolerance failures, patient experience, number of other foods introduced

# The Pathway



# Tailoring support for introducing peanut

- Home introduction advice, written information and email contact
- Supervised introduction; single 12 gram portion in consultation
  - Usually peanut butter from spoon
  - Monitor for one hour after
- Challenge; 12 gram cumulative dose – 3 to 4 portions
- Follow up telephone consultation after 4 weeks
- Offer repeat skin prick test + / - supervised introduction if symptoms

# THREE HEAPED TEASPOONS (OR PACKET PORTIONS) PER WEEK

## Commercial packet portions

### 1.5 teaspoons of peanut powder



### 8 gram Heaped Teaspoon of peanut butter

8 grams per week confers  
significant protection



.... for at least one year, and preferably for the first five years of life.

# Steps in preventing peanut allergy

- Early recognition of risk factors
- Are parents concerned baby may develop peanut allergy?
- Do other family members have peanut allergy?
- Would parents be happy for baby to eat peanut regularly at home?
- SPT
- ? Challenge
- ? Refer peanut immunotherapy study

# Possible performance indicators

- What balance of babies are referred and engage?
  - Age
  - Eczema history and severity
  - Ethnicity
  - Maternal age
  - Other food allergies
- Safety; number of anaphylaxis in hospital and at home
- Uptake of intervention (at one month) and consumption at 12 months
- % oral tolerance failures
- Patient experience
- Number of other foods introduced

# Acknowledgements

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- Joanna Craven
- Mary Feeney
- Charlotte Stedman
- George du Toit



# Key Points

- Why do babies develop food allergy?
- Regular consumption of peanut can prevent peanut allergy
- Prioritising peanut
- Eczema as a target group
- Pathway
- Intervention
- Assessing a pathway for babies