Subgroups and Intervention Effects in Infants at Risk for Peanut Allergy: A Re-analysis of Publicly Available Clinical Trial Data

Sandra Andorf
sandra.andorf@cchmc.org

Cincinnati Children's
changing the outcome together

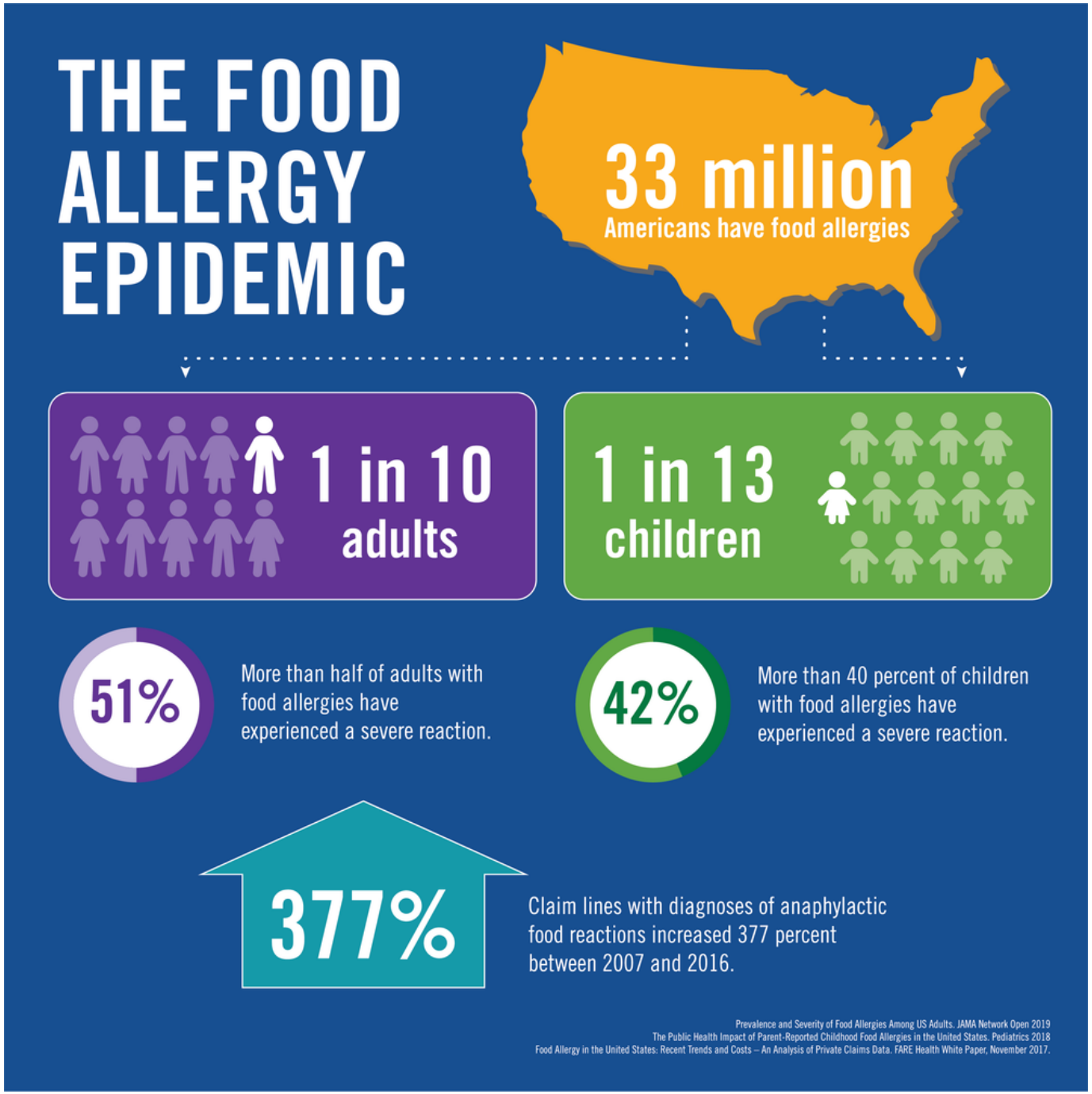
University of CINCINNATI

5/16/2024

Outline

- Food allergy and the LEAP trial

- Secondary analysis of the LEAP trial
  - Baseline model with limit of detection (LOD) adjustment
  - Sensitivity analysis: Baseline model without LOD adjustment
  - Modeling based on baseline and 12-month data
  - Summary



- ~3 million patients visit the emergency room each year in the US because of their food allergy
- Around 2% of US children have a peanut allergy

Figure source: FARE Food Allergy Research & Education

https://www.foodallergy.org/resources/facts-and-statistics

Cincinnati Children's changing the outcome together | University of CINCINNATI

Diagnosis and management of IgE-mediated food allergy

- Skin prick test (SPT) wheal diameter
- Serum food-specific IgE levels
- Specific IgE against individual allergens (components)

- Management options:
  - Avoidance
  - Oral immunotherapy

What about prevention?

Assessment of risk for food allergy development in infancy

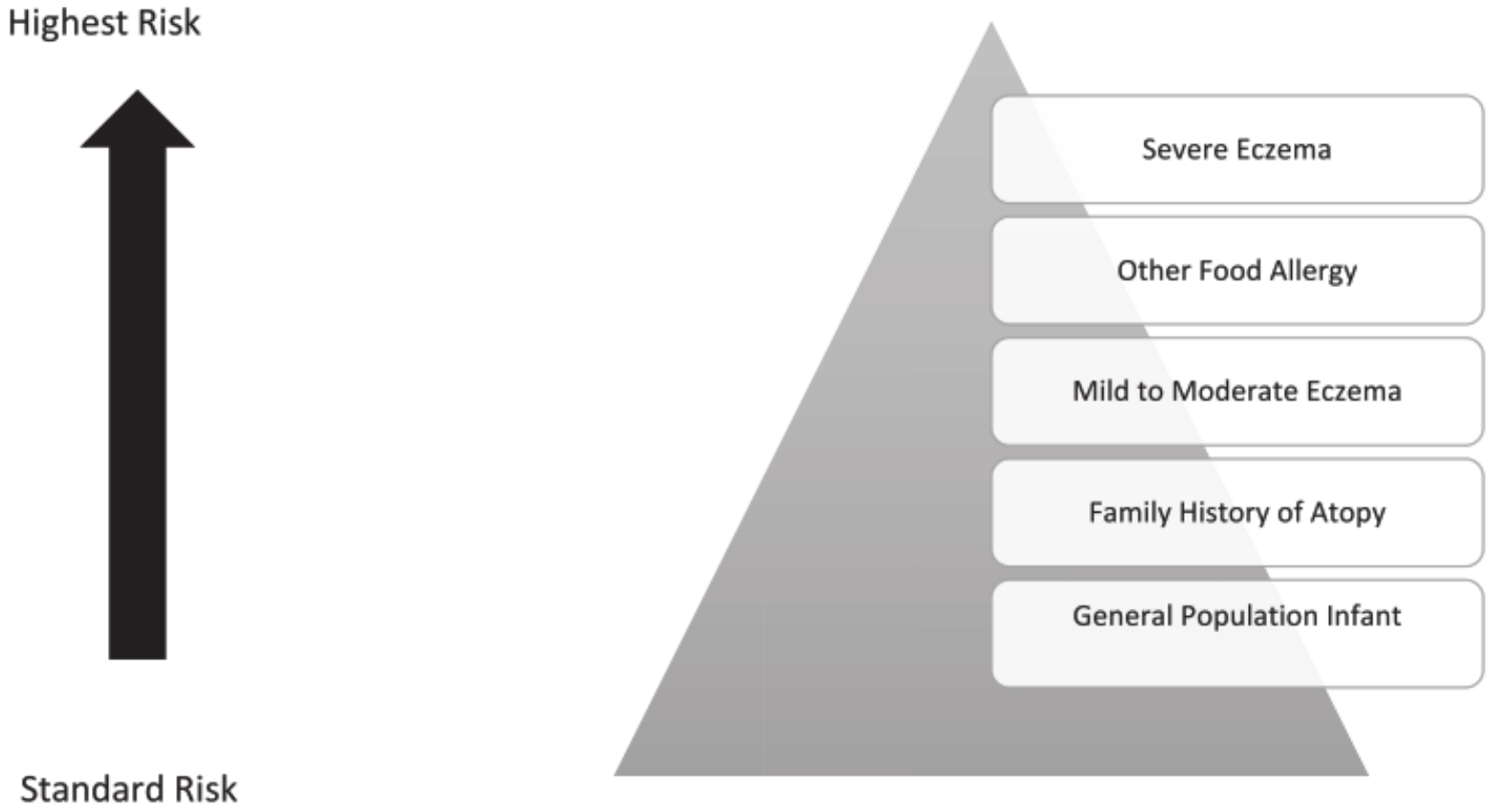


Image Credit: Fleischer et al. A Consensus Approach to the Primary Prevention of Food Allergy Through Nutrition: Guidance from the American Academy of Allergy, Asthma, and Immunology; American College of Allergy, Asthma, and Immunology; and the Canadian Society for Allergy and Clinical Immunology. *J Allergy Clin Immunol Pract*. 2020; 9(1): 22-43.
Adapted from AAAAI Teaching Slides.

Cincinnati Children's changing the outcome together | University of CINCINNATI

Why is severe eczema a risk factor?

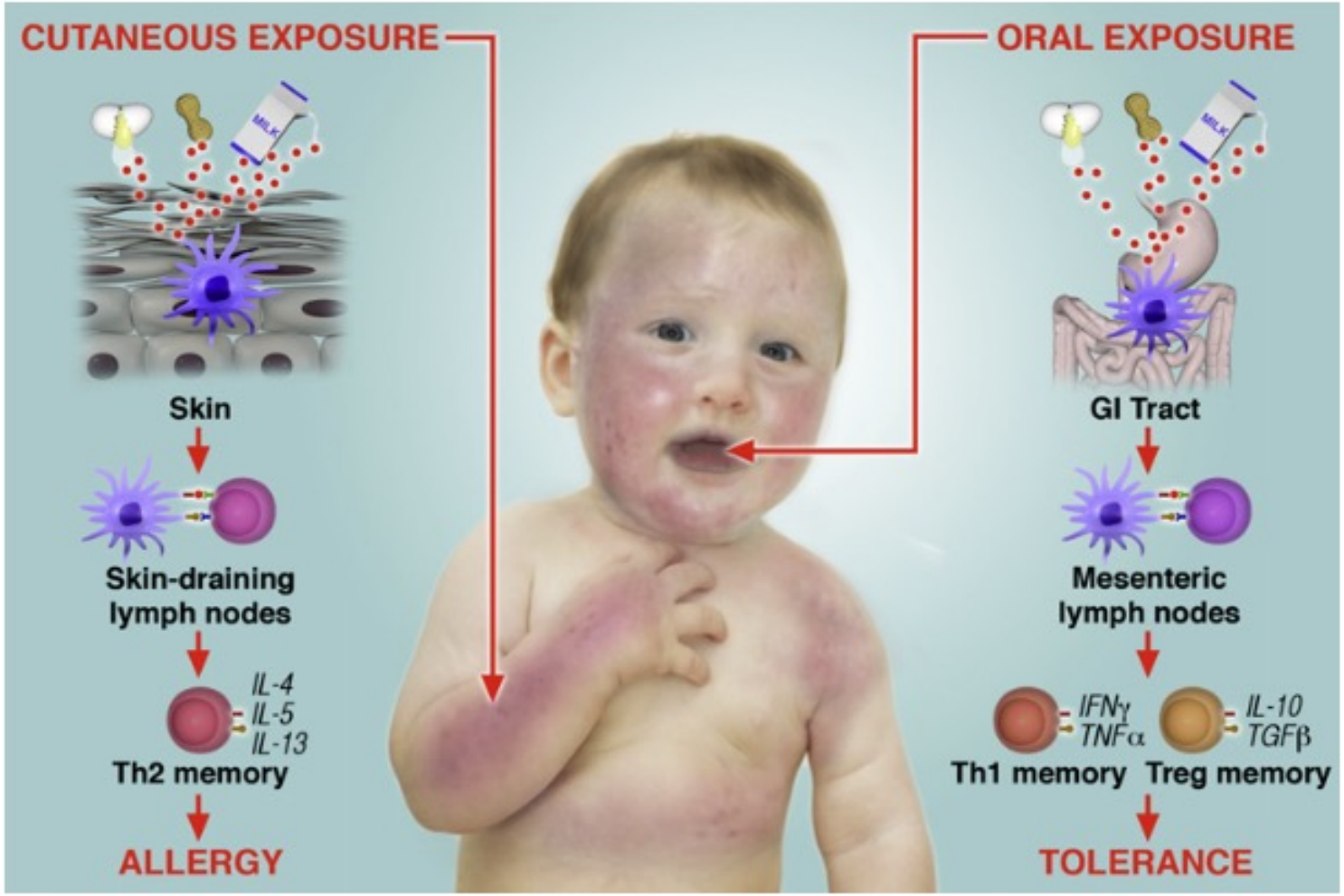


Image Credit: Lack, G. Epidemiologic risks for food allergy. *J Allergy Clin Immunol*. 2008; 121(6): 1331-1336.
Adapted from AAAAI Teaching Slides.

Cincinnati Children's changing the outcome together | University of CINCINNATI

The LEAP (Learning Early About Peanut allergy) study

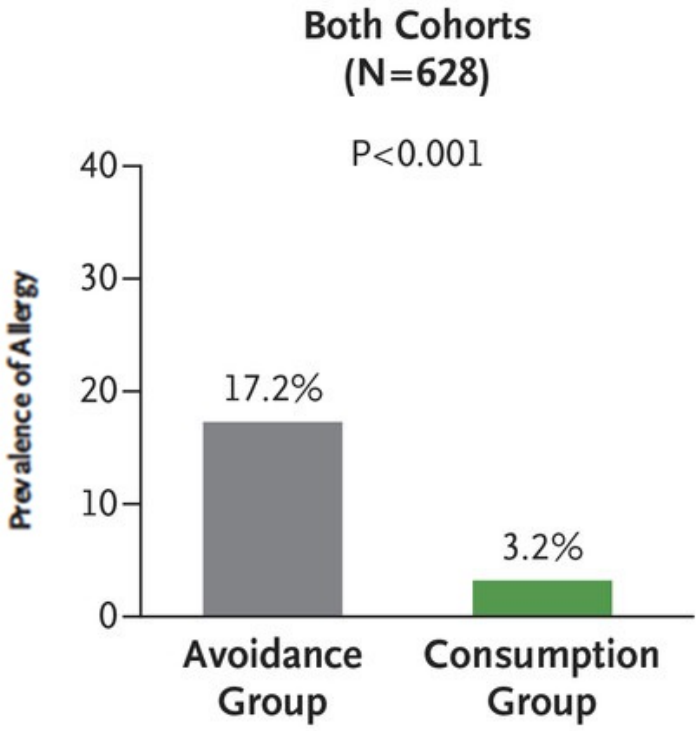
Du Toit *et al*., N Engl J Med 2015; 372:803-813

- 640 children; between 4 and 11 months of age
- At high risk for peanut allergy (existing egg allergy and/or severe eczema)
- Peanut skin prick test wheal <=4 mm

- Two groups:
  - Consumption: Consumed a peanut containing snack (equivalent to 6 grams of peanut protein each week)
  - Avoidance: Did not ingest peanut-containing foods

- Primary outcome: Peanut allergy status at 60 months of age

Significant reduction in peanut allergy prevalence with early introduction



Among high-risk infants, regular peanut consumption starting in the first 11 months of life results in a marked reduction in the prevalence of peanut allergy at 5 years of age.

Du Toit *et al.*, N Engl J Med 2015; 372:803-813

Cincinnati Children's changing the outcome together | University of Cincinnati

Studies support early introduction of egg and peanut as a means of prevention

Key Points

Question Does the timing of allergenic food introduction to infants affect their risk of developing allergic or autoimmune disease?

Findings There was moderate-certainty evidence that early introduction of egg (from 4-6 months) or peanut (from 4-11 months) was associated with reduced risk of egg or peanut allergy, respectively. There was low- to very low-certainty evidence that early fish introduction was associated with reduced allergic sensitization and rhinitis and high-certainty evidence that timing of gluten introduction was not associated with risk of celiac disease.

Meaning Early introduction of egg or peanut to infants was associated with a reduced risk of egg or peanut allergy.

Ierodiakonou, D. *et al.* Timing of Allergenic Food Introduction to the Infant Diet and Risk of Allergic or Autoimmune Disease A Systematic Reivew and Meta-analysis. *JAMA*. 2016; 316(11): 1181-1192.

Hesitancy of early peanut introduction by caregivers

- Guidance from the American Academy of Allergy, Asthma, and Immunology; American College of Allergy, Asthma, and Immunology; and the Canadian Society for Allergy and Clinical Immunology:
  Introduce peanut-containing products to all infants, irrespective of their relative risk of developing peanut allergy, starting around 6 months of life, though not before 4 months of life.
- NIAID Addendum Guidelines: Infants with severe eczema or egg allergy should introduce by 4-6 months of age with testing prior; Infants with mild to moderate eczema should introduce around 6 months of age; All other infants can introduce peanut foods freely.
- **The acceptability of early peanut introduction remains unclear on the part of caregivers.**
- In a survey, only 31% of caregivers showed willingness to introduce peanut before or at 6 months of age, with 40% of caregivers showing willingness to introduce peanut after 11 months of age.
- The Enquiring About Tolerance (EAT) trial had a below 50% adherence rate to the protocol for high-dose consumption due to feeding difficulties and symptoms with food consumption.

Fleischer *et al., J Allergy Clin Immunol Pract*. 2020; 9(1): 22-43
Abrams *et al*., *J Allergy Clin Immunol Pract*, 2022; 10(1):71-77
Greenhawt *et al., Ann Allergy Asthma Immunol,* 2018; 120(6):620-625
Togias *et al., J Pediatr Nurs*. 2017; 32:91-98
Perkin *et al., J Allergy Clin Immunol*, 2019; 144(6):1595-1605

Outline

- Food allergy and the LEAP trial

- Secondary analysis of the LEAP trial
  - Baseline model with limit of detection (LOD) adjustment
  - Sensitivity analysis: Baseline model without LOD adjustment
  - Modeling based on baseline and 12-month data
  - Summary

Secondary analysis of data from LEAP – objectives

- Determine risk subgroups within infants at high risk for peanut allergy according to their predicted probability of developing peanut allergy if avoiding peanut.

Defining the window of opportunity and target populations to prevent peanut allergy

Graham Roberts, DM,[a] Henry T. Bahnson, MPH,[b] George Du Toit, MB, BCh,[c] Colin O'Rourke, MS,[b] Michelle L. Sever, PhD,[d] Erica Brittain, PhD,[e] Marshall Plaut, MD,[e] and Gideon Lack, MB, BCh, FRCPCH[c]

Southampton, Isle of Wight, and London, United Kingdom; Seattle, Wash; Wilmington and Durham, NC; and Bethesda, Md

…and more

Received: 17 March 2022 | Revised: 4 November 2022 | Accepted: 7 November 2022

DOI: 10.1111/all.15597

Allergy EAACI WILEY

ORIGINAL ARTICLE

Early introduction of peanut reduces peanut allergy across risk groups in pooled and causal inference analyses

Kirsty Logan[1] | Henry T. Bahnson[2] | Alyssa Ylescupidez[2] | Kirsten Beyer[3] | Johanna Bellach[3] | Dianne E. Campbell[4] | Joanna Craven[1] | George Du Toit[1] | E. N. Clare Mills[5] | Michael R. Perkin[6] | Graham Roberts[7] | Ronald van Ree[8] | Gideon Lack[1]

Secondary analysis of data from LEAP – objectives

- Determine risk subgroups within infants at high risk for peanut allergy according to their predicted probability of developing peanut allergy if avoiding peanut.

- Estimate the intervention effect of early introduction of peanut for these risk subgroups.

CLINICAL & EXPERIMENTAL ALLERGY
TRUSTED EVIDENCE IN ALLERGY

ORIGINAL ARTICLE | Open Access

Risk subgroups and intervention effects among infants at high risk for peanut allergy: A model for clinical decision making

Yuxiang Li, Ashley Devonshire, Bin Huang, Sandra Andorf

First published: 19 January 2024 | https://doi.org/10.1111/cea.14452

Yuxiang Li
Biostatistics and Epidemiology

Bin Huang
Biostatistics and Epidemiology

Ashley Devonshire
Allergy and Immunology

Cincinnati Children's changing the outcome together | University of CINCINNATI

LEAP individual participant data availability

ImmPort Shared Data
Your site for searching and downloading shared data

SDY660 - LEAP ITN032AD: Induction of Tolerance through Early Introduction of Peanut in High-Risk Children, LEAP-On ITN049AD: The Persistence of Oral Tolerance Induction to Peanut and Its Immunological Basis

Download | HL7 FHIR

Summary | Design | Adverse Event | Assessment | Interventions | Medications | Substance | Demographics | Lab Tests | Mechanistic Assays | Study Files

Summary

Accession	SDY660
Title	LEAP ITN032AD: Induction of Tolerance through Early Introduction of Peanut in High-Risk Children, LEAP-On ITN049AD: The Persistence of Oral Tolerance Induction to Peanut and Its Immunological Basis
DOI	10.21430/M3SFPACKA3
Brief Description	ITN032AD: This study will evaluate whether early exposure to peanuts promotes tolerance and provides protection from developing peanut allergy in children who are allergic to eggs or who have severe eczema. ITN049AD: This study will evaluate persistent tolerance to peanut by assessing the effect of 12 months of cessation of peanut consumption after 5 years of consumption versus continued avoidance of peanut.
Research	Atopy/Allergy

www.immport.org

Immune Tolerance Network TrialShare Clinical Trials Research Portal
INNOVATION · COLLABORATION
A clinical research consortium funded by NIAID

ITN032AD

Leap
Learning Early About Peanut Allergy

LEAP: INDUCTION OF TOLERANCE THROUGH EARLY INTRODUCTION OF PEANUT IN HIGH-RISK CHILDREN

This is a randomized controlled trial in which children at high risk for peanut allergy (as demonstrated by eczema, egg allergy, or both) are enrolled. Participants are stratified based on skin prick test (SPT) results for peanut into those with a wheal diameter of 0 mm (SPT-negative stratum), and those with a wheal diameter of 1, 2, 3, or 4 mm (SPT-positive). Participants in each stratum are randomly assigned to receive a peanut-containing snack or to avoid peanut. The group assigned to receive a peanut-containing snack will eat at least 2 g of peanut protein three times per week until 60 months of age. The prevalence of peanut allergy at that time is compared between the peanut consumption and the avoidance groups.

VIEW STUDY LEAP
VIEW STUDY AT CLINICALTRIALS.GOV

MANUSCRIPTS AND ABSTRACTS

J Allergy Clin Immunol 2019
Association of Staphylococcus aureus colonization with food allergy occurs independently of eczema severity
J Allergy Clin Immunol. 2019 May 29. pii: S0091-6749(19)30611-6
Tsilochristou O, George du Toit, Peter H. Sayre, Graham Roberts, Kaitie Lawson, Michelle L. Sever, Henry T. Bahnson, Suzana Radulovic, Monica Basting, Marshall Plaut, Gideon Lack
PUBMED

Journal of Allergy and Clinical Immunology 2019
The MALT1 locus and peanut avoidance in the risk for peanut allergy.
J Allergy Clin Immunol. 2019 Jun;143(6):2326-2329
Alexandra Winters, Henry T. Bahnson, Ingo Ruczinski,, Meher P. Boorgula, Claire Malley, MS, Ali R. Keramati, MD, Sameer Chavan,, David Larson, Karen Cerosaletti, Peter H. Sayre, Marshall Plaut, George Du Toit, Gideon Lack, Kathleen C. Barnes, Gerald T. Nepom, Rasika A. Mathias, for the Immune Tolerance Network LEAP Study Team.
PUBMED

www.itntrialshare.org

Step 0: Download raw data of the LEAP trial from ITN TrialShare (ID: ITN032AD)

Step 0: Download raw data of the LEAP trial from ITN TrialShare (ID: ITN032AD)

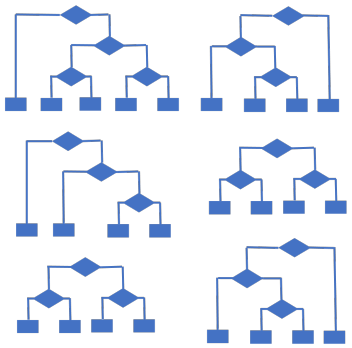
Step 1: Predict risk subgroups in infants at high risk of peanut allergy

Avoidance arm

n=314 participants

Input variables
Age
Sex
Peanut sIgE
Ara h 1 sIgE
Ara h 2 sIgE
Ara h 3 sIgE
Ara h 8 sIgE
…

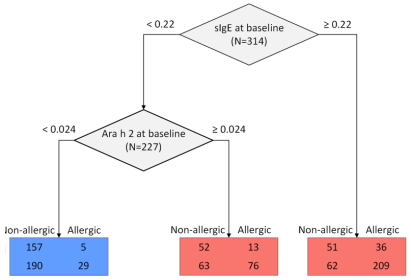
Random forest



Important variables

Peanut sIgE
Ara h 2 sIgE

Decision tree (CART model)

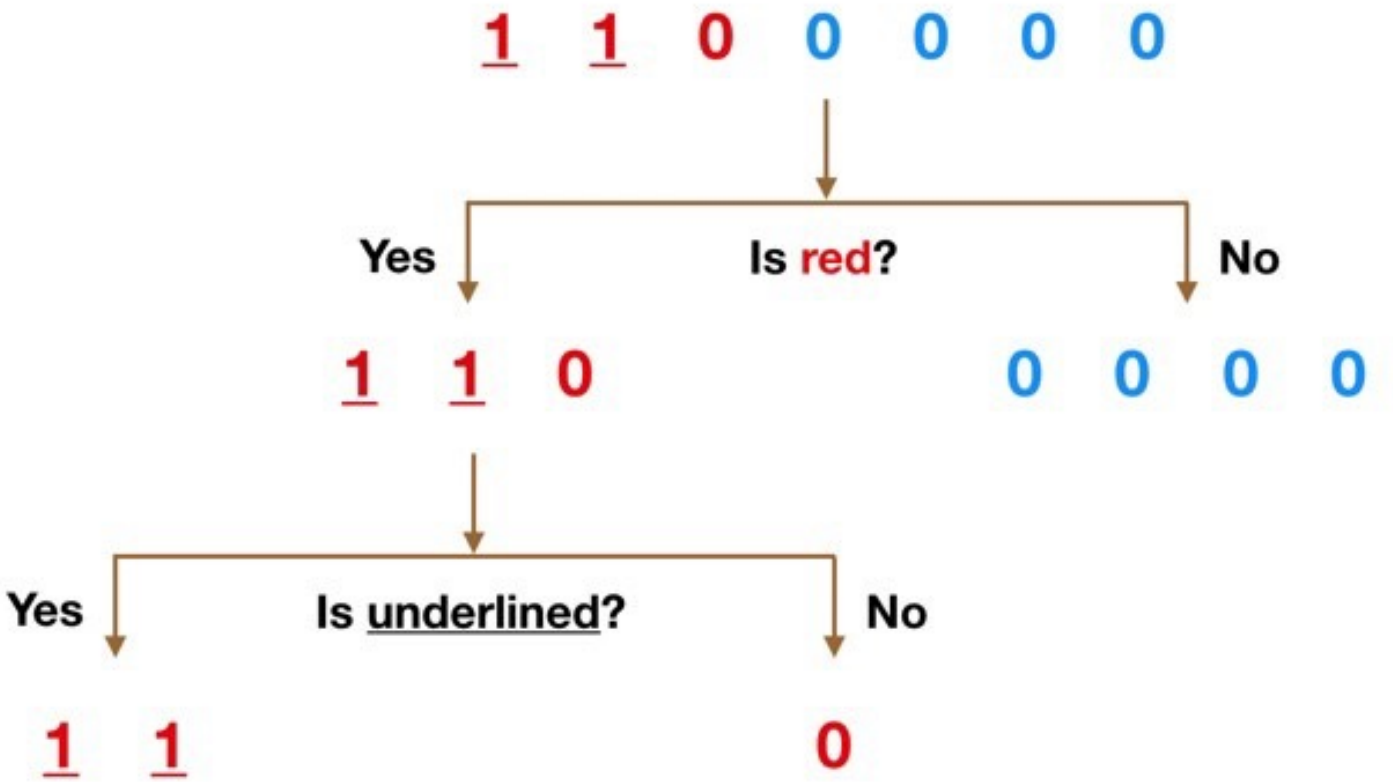


Step 2: Estimate the intervention effect per risk subgroup

Estimate averaged intervention treatment effect for each risk subgroup using stabilized inverse probability weighting (sIPW).

Intervention arm
i.e., peanut consumption arm.
n=307 participants

Introduction to Decision Trees



Main advantages:

- Interpretable
- Can handle both numeric and categorical data

Main disadvantage:

- Prone to overfitting

One approach to reduce the likelihood of overfitting is pruning the tree. Reducing the depth of the tree (more on this later).

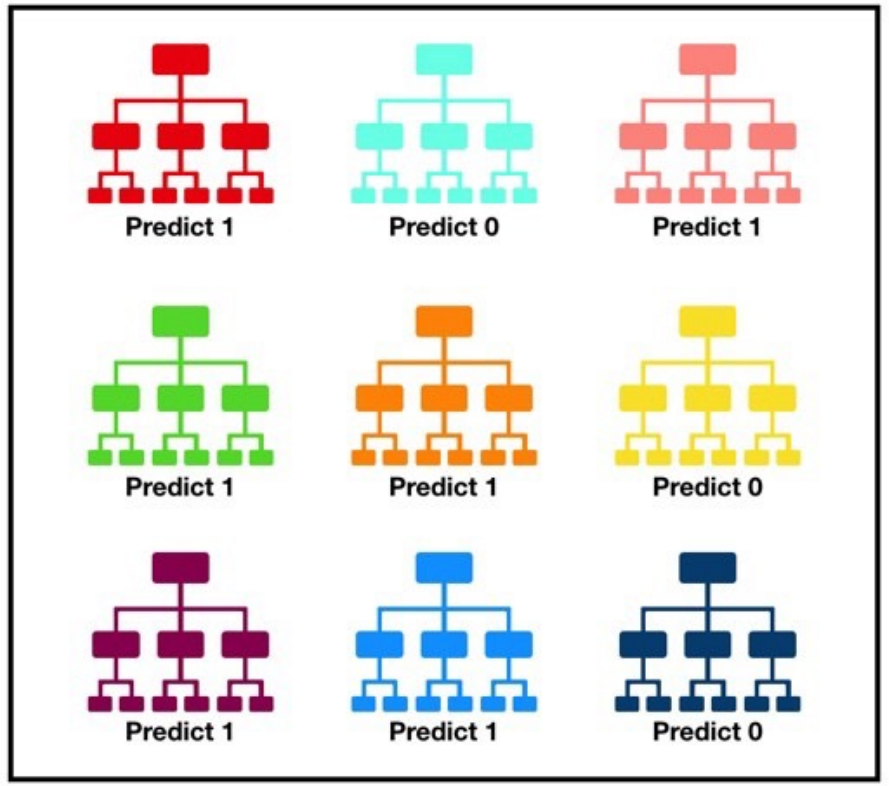
Graphs from: https://towardsdatascience.com/understanding-random-forest-58381e0602d2

Introduction to Random Forest

- An ensemble of individual decision trees

- A low correlation between trees is achieved during training by:
  1. Bagging (Bootstrap Aggregation): For each individual tree, samples from the dataset are randomly selected with replacement
  2. Feature Randomness: For each node split, only a random subset of features/variables is considered

- Main advantages:
  - Reduced risk of overfitting
  - Easy to determine variable importance
- Main disadvantage:
  - Not easily interpretable (compared to a single tree)



Graphs from: https://towardsdatascience.com/understanding-random-forest-58381e0602d2

Outline

- Food allergy and the LEAP trial

- Secondary analysis of the LEAP trial
  - Baseline model with limit of detection (LOD) adjustment
  - Sensitivity analysis: Baseline model without LOD adjustment
  - Modeling based on baseline and 12-month data
  - Summary

Demographics and clinical characteristics of the avoidance arm

Variable	Non-allergic	Allergic	P*	Overall
N	**260**	**54**		314
Sex, male, no. (%)	164 (63.1)	39 (72.2)	0.262	203 (64.6)
Race, no. (%)			0.002	
White	207 (79.6)	31 (57.4)		238 (75.8)
Asian	6 (2.3)	5 (9.3)		11 (3.5)
Black	20 (7.7)	6 (11.1)		26 (8.3)
Mixed	27 (10.4)	12 (22.2)		39 (12.4)
Age, month (median [IQR])	7.80 [6.47, 9.11]	7.84 [5.96, 8.85]	0.49	7.82 [6.42, 9.10]
SPT-positive Stratum, no. (%)	33 (12.7)	18 (33.3)	<0.001	51 (16.2)
Eczema, no. (%)	225 (86.5)	52 (96.3)	0.073	277 (88.2)
Egg allergy, no. (%)	160 (61.5)	43 (79.6)	0.018	203 (64.6)
peanut sIgE at baseline, kU/L (median [IQR])	0.02 [0.00, 0.13]	0.43 [0.08, 2.35]	<0.001	0.03 [0.00, 0.31]
Ara h 1 at baseline, kU/L (median [IQR])	0.00 [0.00, 0.00]	0.03 [0.00, 0.13]	<0.001	0.00 [0.00, 0.02]
Ara h 2 baseline, kU/L (median [IQR])	0.00 [0.00, 0.04]	0.04 [0.03, 0.12]	<0.001	0.00 [0.00, 0.04]
Ara h 3 at baseline, kU/L (median [IQR])	0.00 [0.00, 0.02]	0.02 [0.00, 0.08]	<0.001	0.00 [0.00, 0.02]
Ara h 8 at baseline, kU/L (median [IQR])	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.012	0.00 [0.00, 0.00]
Ara h 9 at baseline, kU/L (median [IQR])	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.01	0.00 [0.00, 0.00]
peanut sIgG4 at baseline, μg/L (median [IQR])	70.00 [70.00, 70.00]	70.00 [70.00, 70.00]	0.005	70.00 [70.00, 70.00]
Peanut wheal at baseline mm (median [IQR])	0.00 [0.00, 0.00]	0.00 [0.00, 2.00]	<0.001	0.00 [0.00, 0.00]

Cincinnati Children's changing the outcome together | University of CINCINNATI

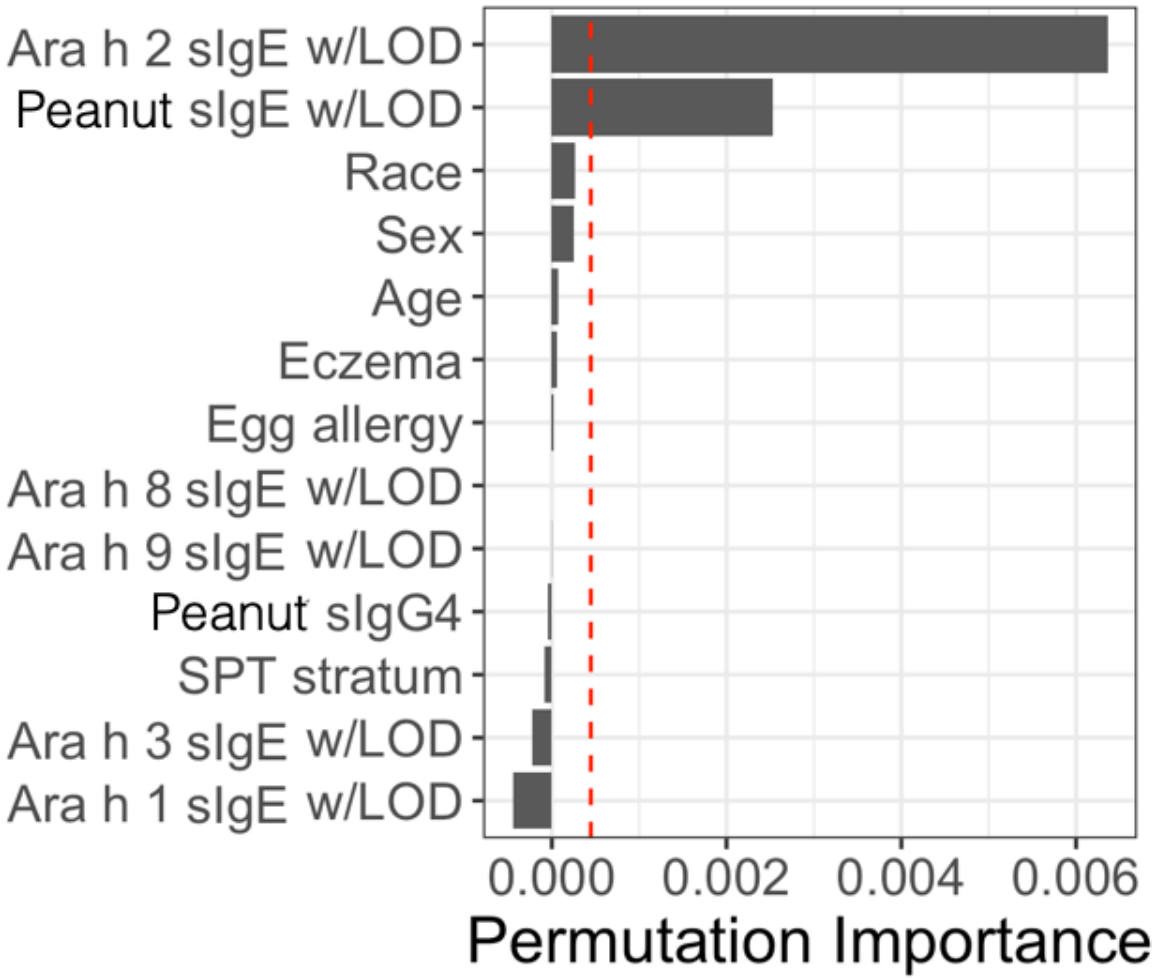
Variables presented to the random forest for variable selection

Demographic variables	Age, sex, race
Blood biomarkers	Peanut sIgE, peanut specific IgG_4, sIgE to Ara h 1, Ara h 2, Ara h 3, Ara h 8, and Ara h 9
Clinical variables	Severe eczema status, egg allergy status, skin prick test (SPT) stratum

Baseline model with Limit Of Detection (LOD) adjustment

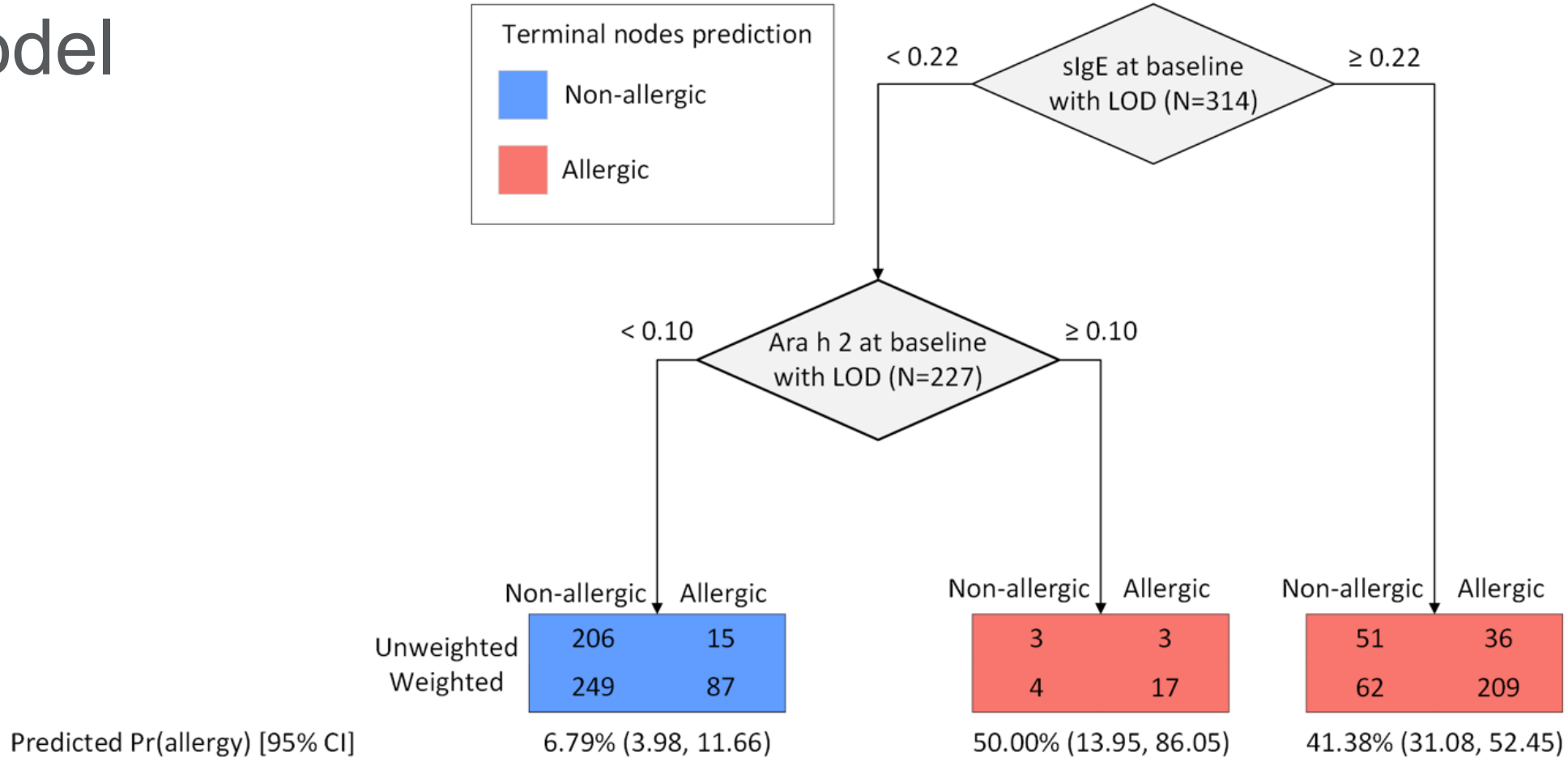
- In clinical practice, laboratories usually measure sIgE to peanut and peanut components with LOD of <0.09 kU/L.
- For the clinical trial, lower levels were measured.
- To create a model considering the LOD used in clinical practice, we replaced all values <0.09 kU/L for peanut sIgE and IgE to the components with 0.045 kU/L.

Random forest: Important variables



Cincinnati Children's changing the outcome together | University of CINCINNATI

CART model



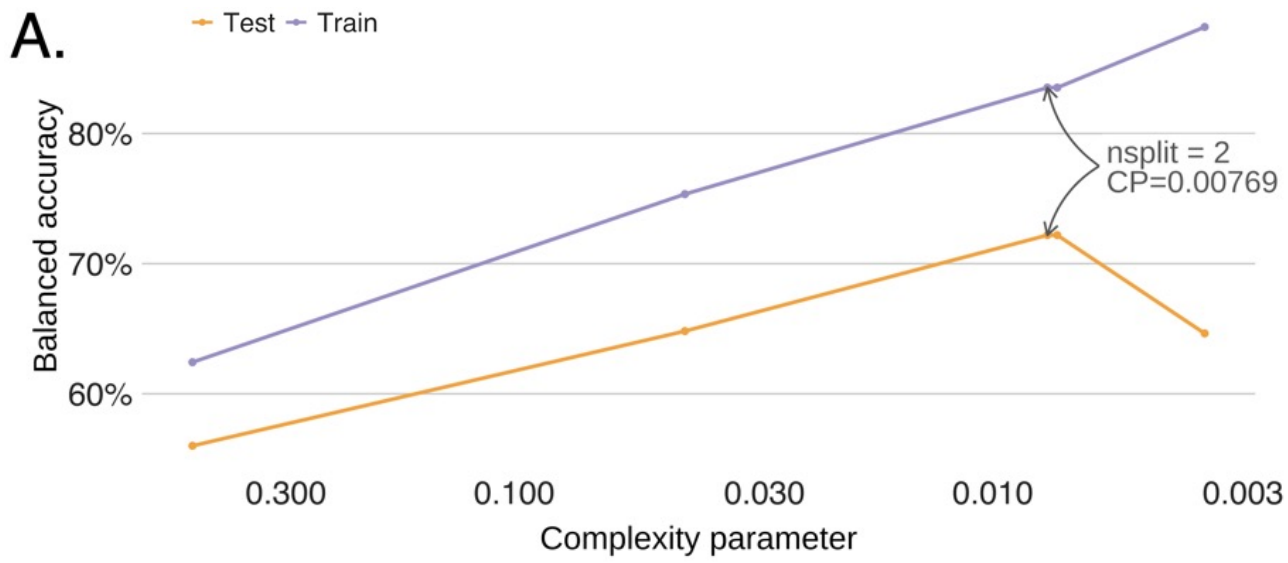
Developed on case-weighted data because of the class imbalance:

- Only about 17% (54/314) of the participants were determined allergic at 60 months of age
- Each class was weighted by the inverse of the proportion of that class

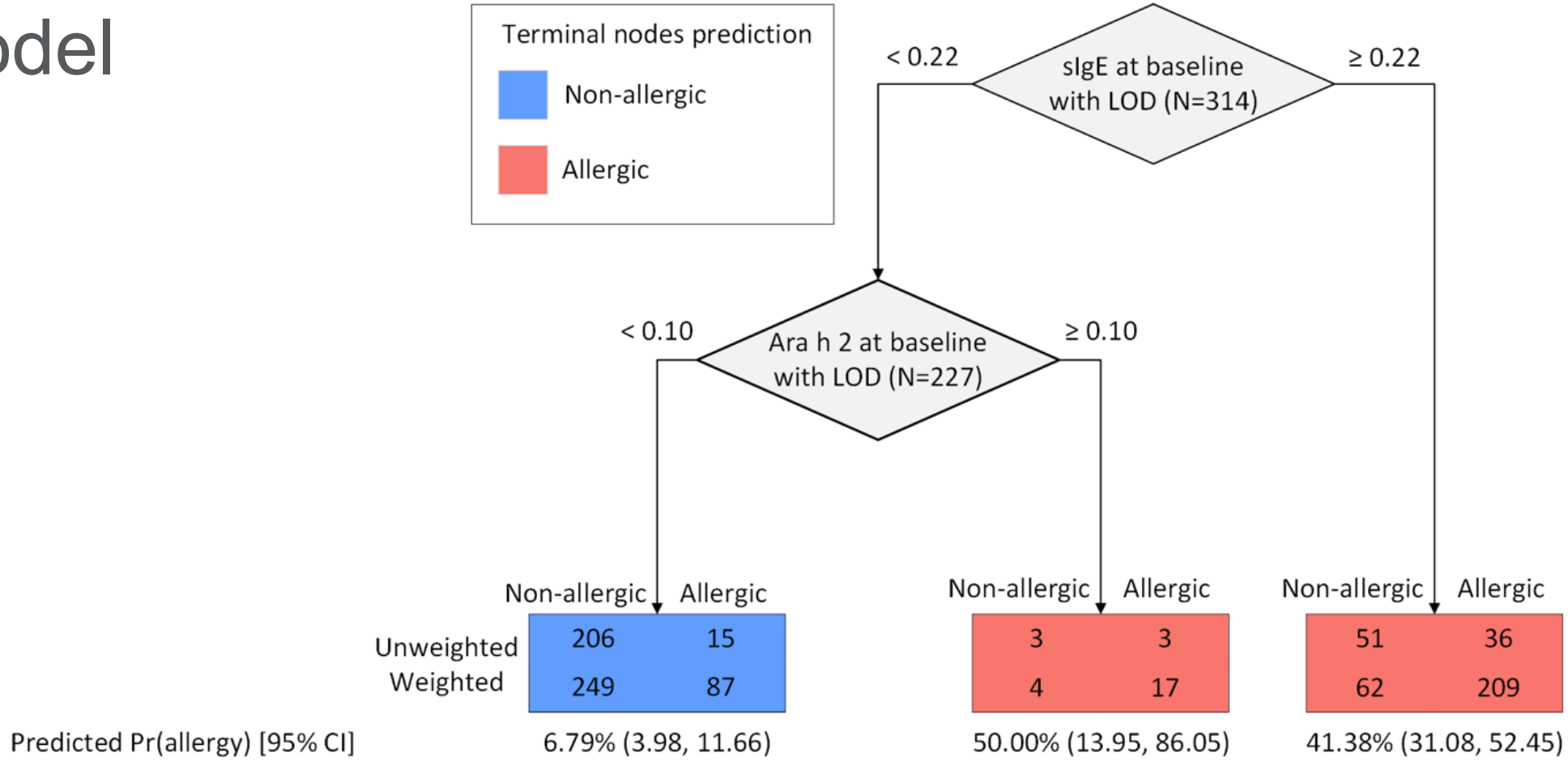
sIgE values in kU/L. CART pruned based on complexity parameter from 10-fold cross validation.

Classification and regression tree (CART) pruning

- A complete tree is grown and then pruned to obtain the optimal tree
- Based on the largest complexity parameter with the highest average balanced accuracy of the test sets from 10-fold cross-validation



CART model

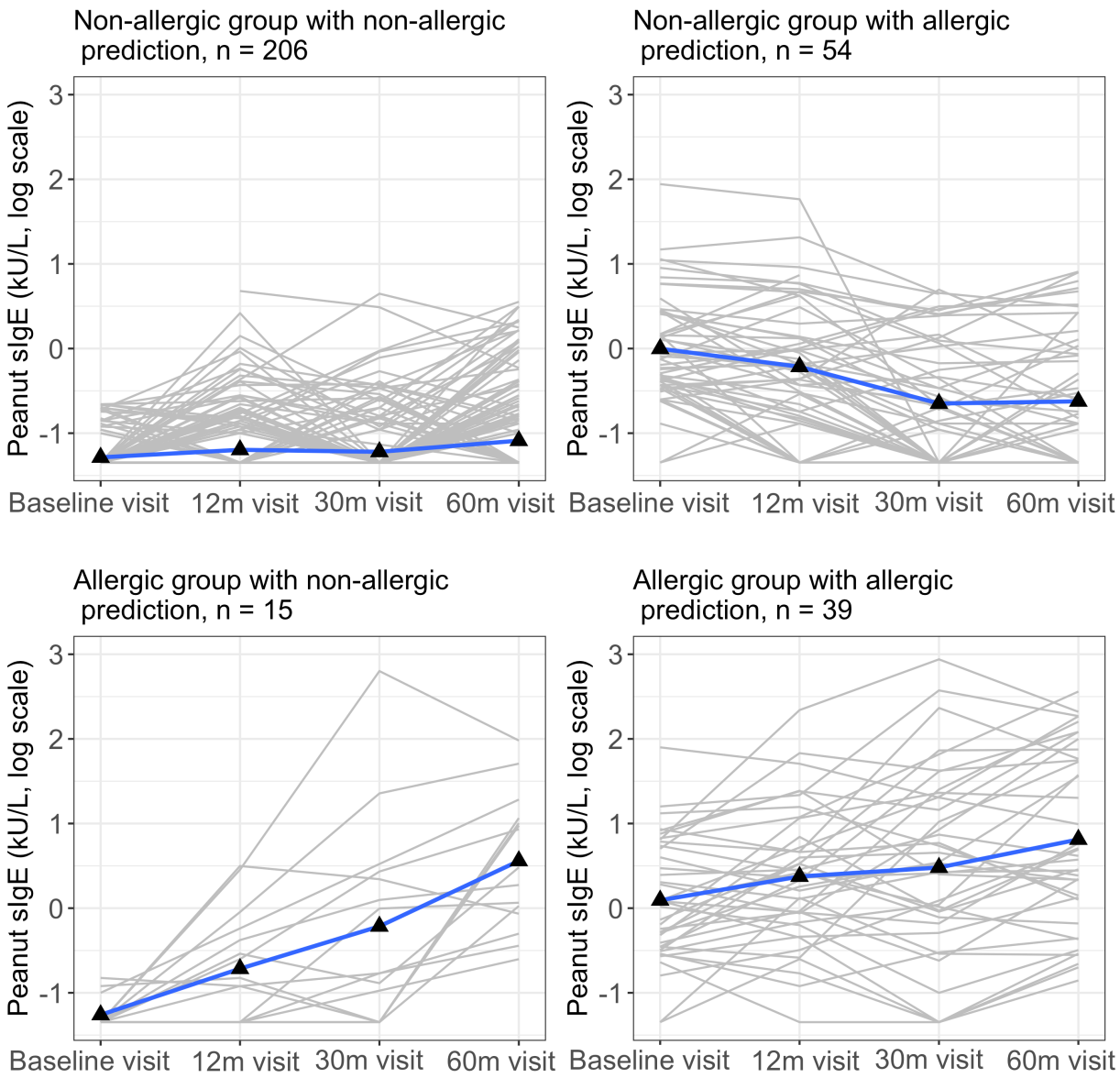


Developed on case-weighted data because of the class imbalance:

- Only about 17% (54/314) of the participants were determined allergic at 60 months of age
- Each class was weighted by the inverse of the proportion of that class

sIgE values in kU/L. CART pruned based on complexity parameter from 10-fold cross validation.

Peanut sIgE trajectory for each cell in the confusion matrix for participants in the avoidance arm



Step 0: Download raw data of the LEAP trial from ITN TrialShare (ID: ITN032AD)

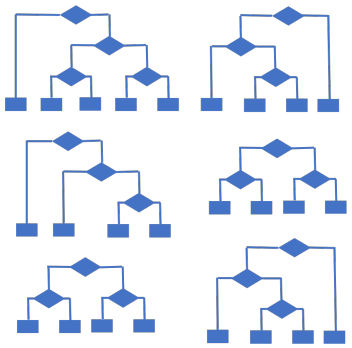
Step 1: Predict risk subgroups in infants at high risk of peanut allergy

Avoidance arm

n=314 participants

Input variables
Age
Sex
Peanut sIgE
Ara h 1 sIgE
Ara h 2 sIgE
Ara h 3 sIgE
Ara h 8 sIgE
…

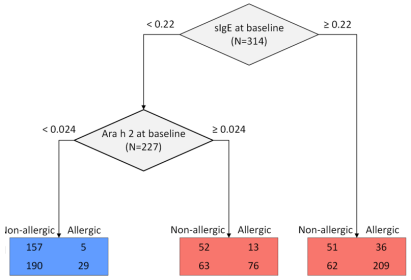
Random forest



Important variables

Peanut sIgE
Ara h 2 sIgE

Decision tree (CART model)



Step 2: Estimate the intervention effect per risk subgroup

Estimate averaged intervention treatment effect for each risk subgroup using stabilized inverse probability weighting (sIPW).

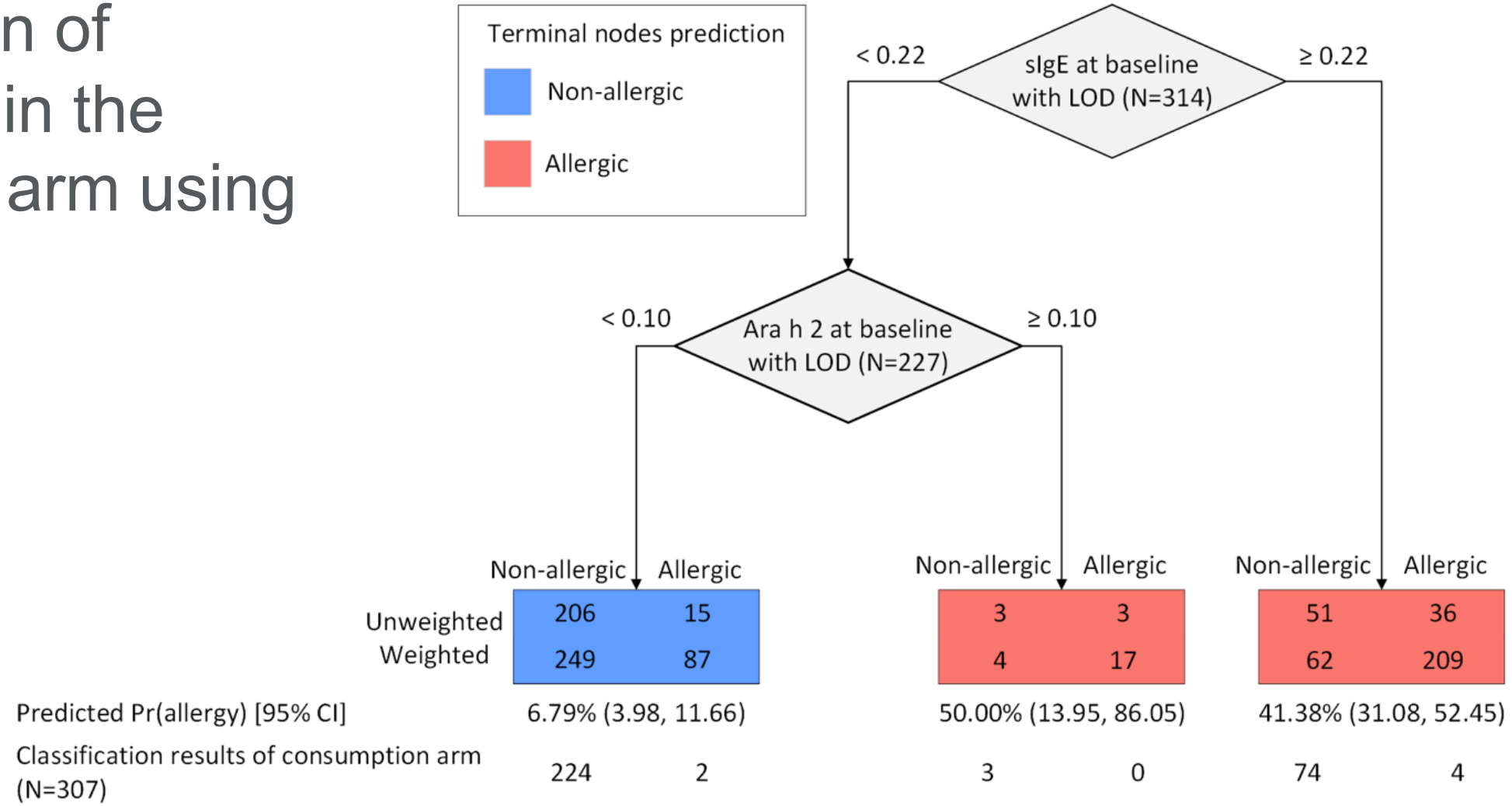
Intervention arm
i.e., peanut consumption arm.
n=307 participants

Baseline demographics and clinical characteristics of the intervention arm

Variable	Non-allergic	Allergic	P*	Overall
N	**301**	**6**		307
Sex, male, no. (%)	165 (54.8)	3 (50.0)	1	168 (54.7)
Race, no. (%)			<0.001	
White	214 (71.1)	4 (66.7)		218 (71.0)
Asian	19 (6.3)	0 (0.0)		19 (6.2)
Black	22 (7.3)	0 (0.0)		22 (7.2)
Mixed	46 (15.3)	1 (16.7)		47 (15.3)
Missing	0 (0.0)	1 (16.7)		1 (0.3)
Age, month (median [IQR])	7.75 [6.18, 9.00]	7.08 [5.60, 9.71]	0.789	7.75 [6.18, 9.03]
SPT-positive Stratum, no. (%)	40 (13.3)	1 (16.7)	1	41 (13.4)
Eczema, no. (%)	269 (89.4)	6 (100.0)	0.866	275 (89.6)
Egg allergy, no. (%)	191 (63.5)	4 (66.7)	1	195 (63.5)
peanut sIgE, kU/L (median [IQR])	0.03 [0.00, 0.20]	0.94 [0.06, 6.55]	0.052	0.03 [0.00, 0.23]
Ara h 1 sIgE, kU/L (median [IQR])	0.00 [0.00, 0.02]	0.02 [0.00, 0.06]	0.192	0.00 [0.00, 0.02]
Ara h 2 sIgE, kU/L (median [IQR])	0.02 [0.00, 0.04]	0.02 [0.00, 0.06]	0.799	0.02 [0.00, 0.04]
Ara h 3 sIgE, kU/L (median [IQR])	0.00 [0.00, 0.02]	0.05 [0.01, 0.16]	0.02	0.00 [0.00, 0.02]
Ara h 8 sIgE, kU/L (median [IQR])	0.00 [0.00, 0.00]	0.00 [0.00, 0.03]	0.021	0.00 [0.00, 0.00]
Ara h 9 sIgE, kU/L (median [IQR])	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.446	0.00 [0.00, 0.00]
peanut sIgG4, μg/L (median [IQR])	70.00 [70.00, 70.00]	70.00 [70.00, 77.37]	0.032	70.00 [70.00, 70.00]
Peanut wheal, mm (median [IQR])	0.00 [0.00, 0.00]	1.50 [0.00, 3.75]	0.747	0.00 [0.00, 0.00]

Cincinnati Children's changing the outcome together | University of CINCINNATI

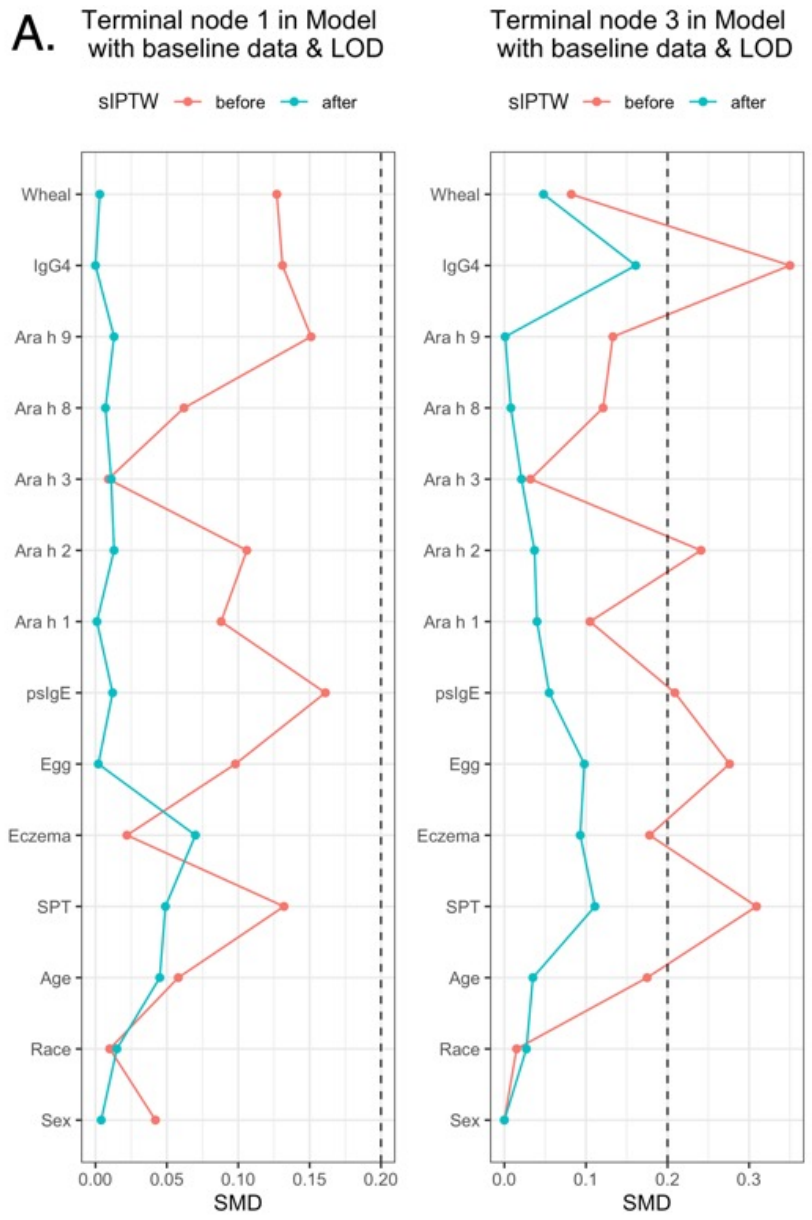
Classification of participants in the intervention arm using the CART



sIgE values in kU/L.

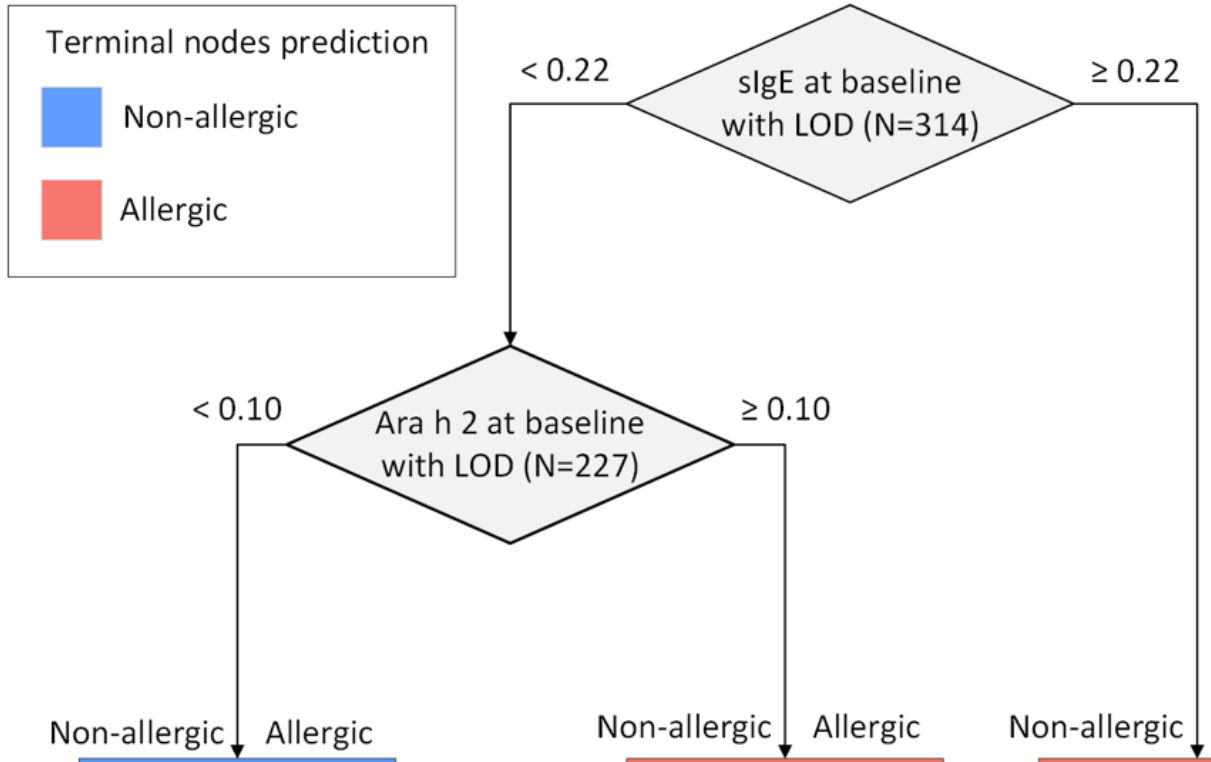
Estimating intervention effects for each risk subgroup

Contrast between the proportion of peanut allergy had the participants in both arms received or not received the intervention by applying stabilized inverse probability weighting (sIPW) to ensure covariate balance.



SMD: standardized mean difference

Estimating intervention effects for each risk subgroup



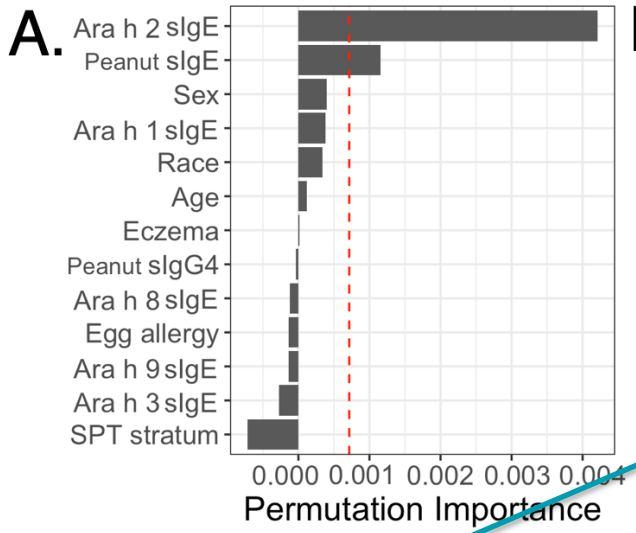
	Non-allergic	Allergic	Non-allergic	Allergic	Non-allergic	Allergic
Unweighted	206	15	3	3	51	36
Weighted	249	87	4	17	62	209
Predicted Pr(allergy) [95% CI]	6.79% (3.98, 11.66)		50.00% (13.95, 86.05)		41.38% (31.08, 52.45)	
Classification results of consumption arm (N=307)	224	2	3	0	74	4
Proportion of allergic participants if two arms received intervention [95% CI]	0.88% (0.15, 3.51)		0.00% (0.00, 69.00)		3.88% (1.02, 11.58)	
Proportion of allergic participants if two arms did not receive intervention [95% CI]	7.37% (4.44, 11.81)		50.00% (13.95, 86.05)		44.29% (33.65, 55.45)	
Intervention effect [95% CI]	-6.49% (-11.00, -2.55)		-50.00% (-86.05, -27.85)		-40.41% (-51.93, -27.28)	

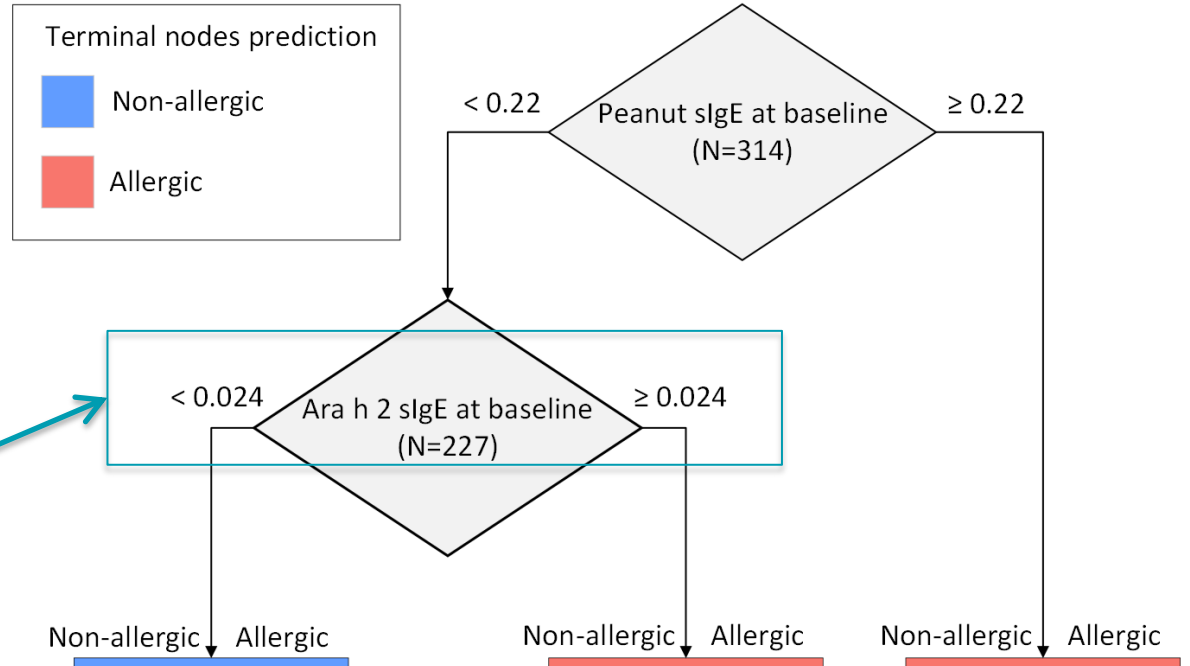
Outline

- Food allergy and the LEAP trial

- Secondary analysis of the LEAP trial
  - Baseline model with limit of detection (LOD) adjustment
  - Sensitivity analysis: Baseline model without LOD adjustment
  - Modeling based on baseline and 12-month data
  - Summary

Sensitivity analysis: Baseline data model without LOD adjustment

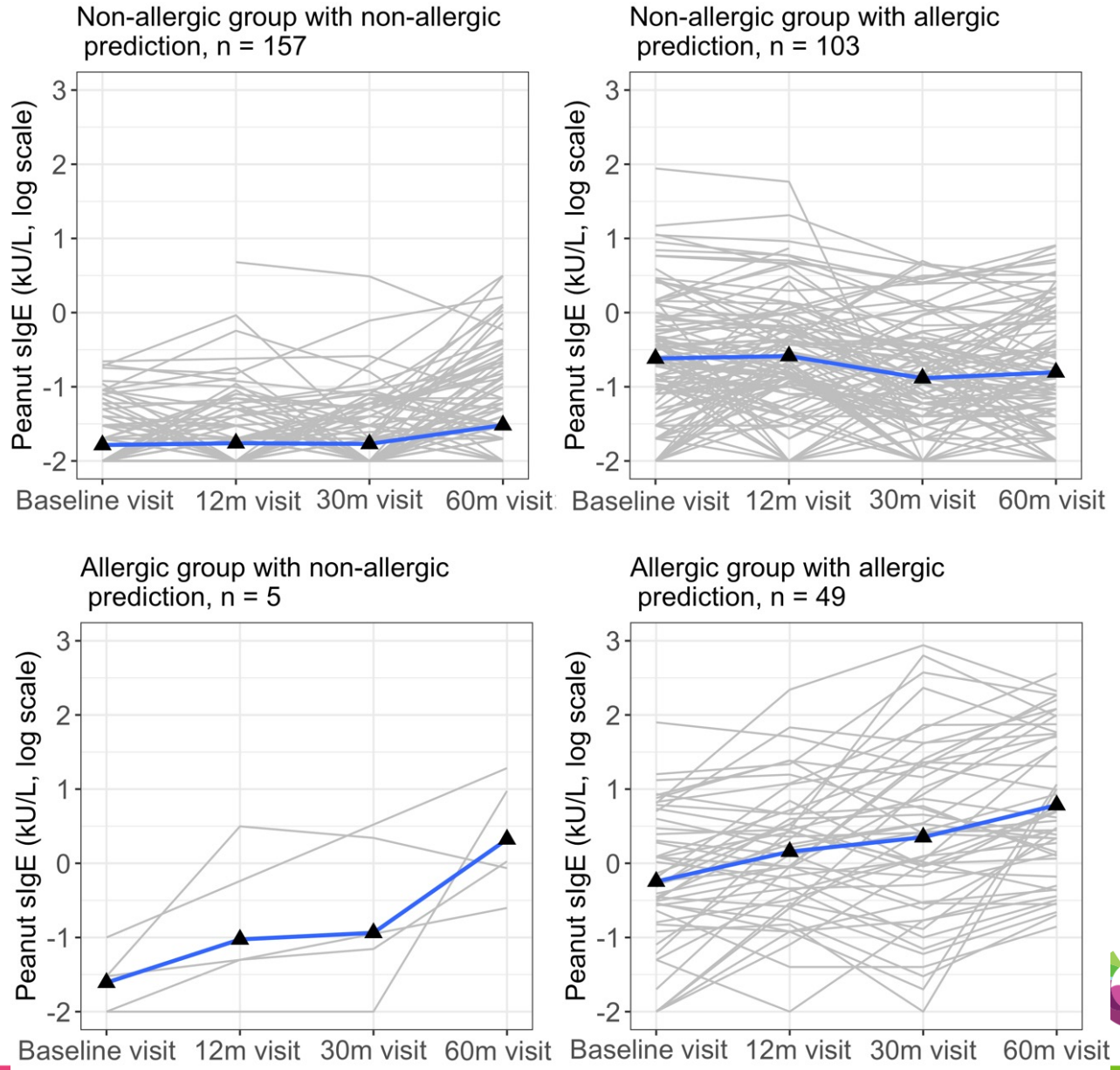




In the baseline model with limit of detection adjustment, the split was at 0.1 kU/L Ara h 2 sIgE

	Non-allergic	Allergic	Non-allergic	Allergic	Non-allergic	Allergic
Unweighted	157	5	52	13	51	36
Weighted	190	29	63	76	62	209
Predicted Pr(allergy) [95% CI]	3.09% (1.14, 7.43)		20.00% (11.48, 32.12)		41.38% (31.08, 52.45)	
Classification results of consumption arm (N=307)	151	2	76	0	74	4
Proportion of allergic participants if both arms received intervention [95% CI]	1.31% (0.22, 5.19)		0.00% (0.00, 62.70)		3.83% (1.01, 11.42)	
Proportion of allergic participants if both arms did not receive intervention [95% CI]	3.49% (1.40, 7.87)		20.66% (12.09, 32.65)		44.26% (33.60, 55.45)	
Intervention effect [95% CI]	-2.18% (-6.69, 2.23)		-20.66% (-32.65, -10.04)		-40.43% (-51.97, -27.34)	

Peanut sIgE trajectory for each cell in the confusion matrix for participants in the avoidance arm

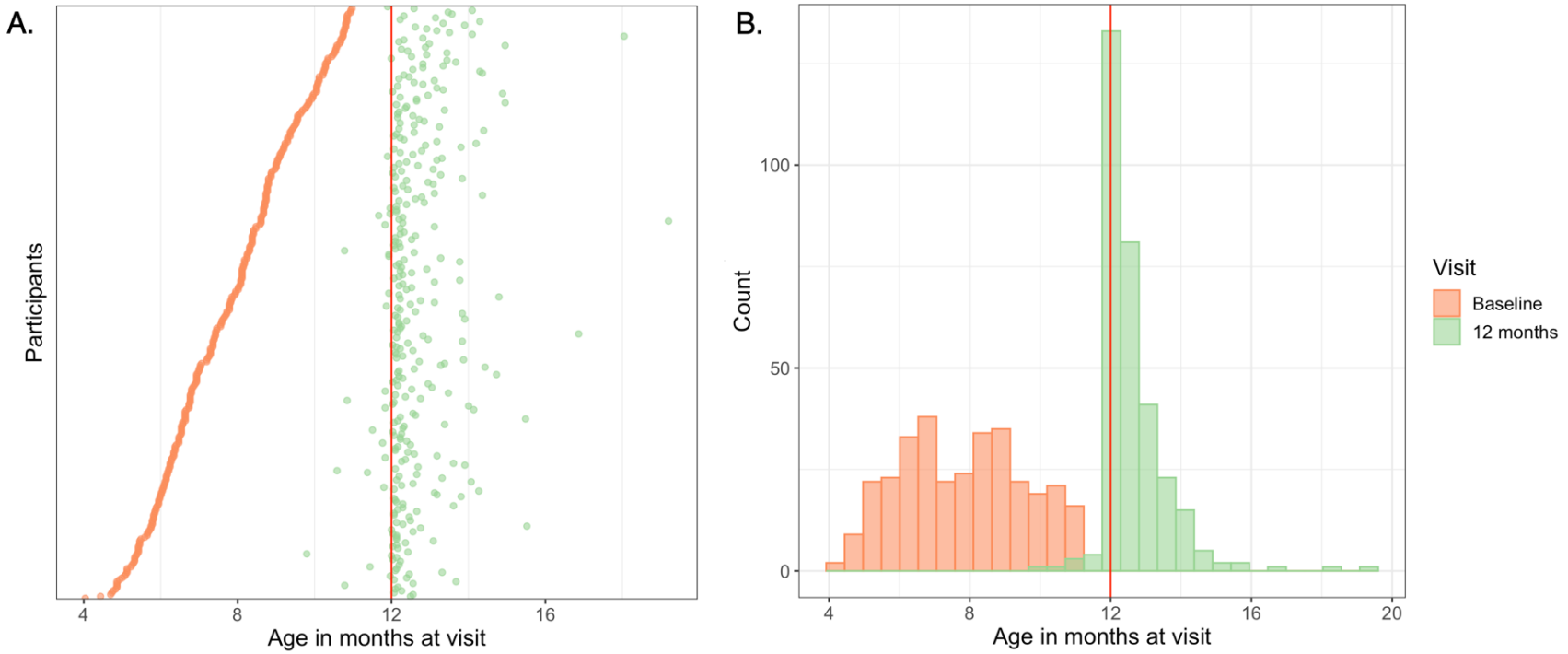


Outline

- Food allergy and the LEAP trial

- Secondary analysis of the LEAP trial
  - Baseline model with limit of detection (LOD) adjustment
  - Sensitivity analysis: Baseline model without LOD adjustment
  - Modeling based on baseline and 12-month data
  - Summary

Baseline and 12-months model: Age considerations

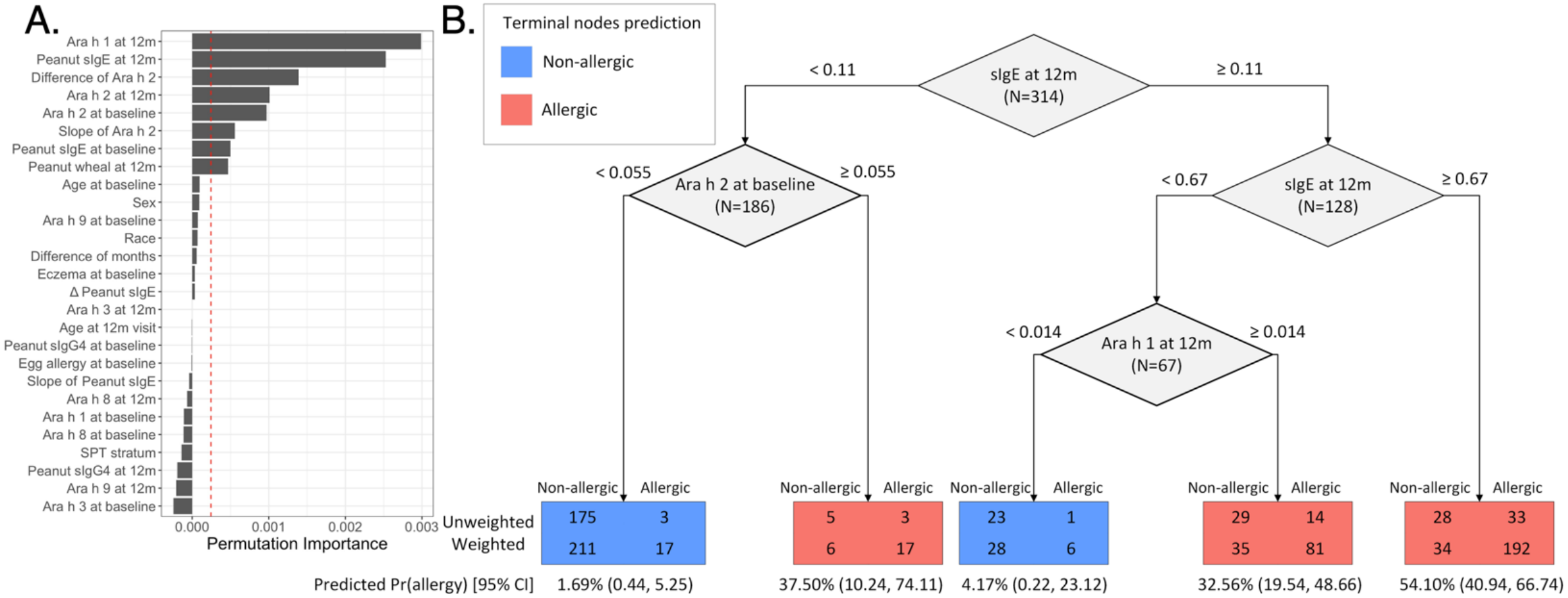


Additional variables to those at baseline and 12-months:

- time in months between baseline visit and 12-month visit
- difference between peanut sIgE measured at baseline visit and 12-month visit
- difference between IgE to Ara h 2 measured at baseline visit and 12-month visit
- slope of peanut sIgE
- slope of IgE to Ara h 2

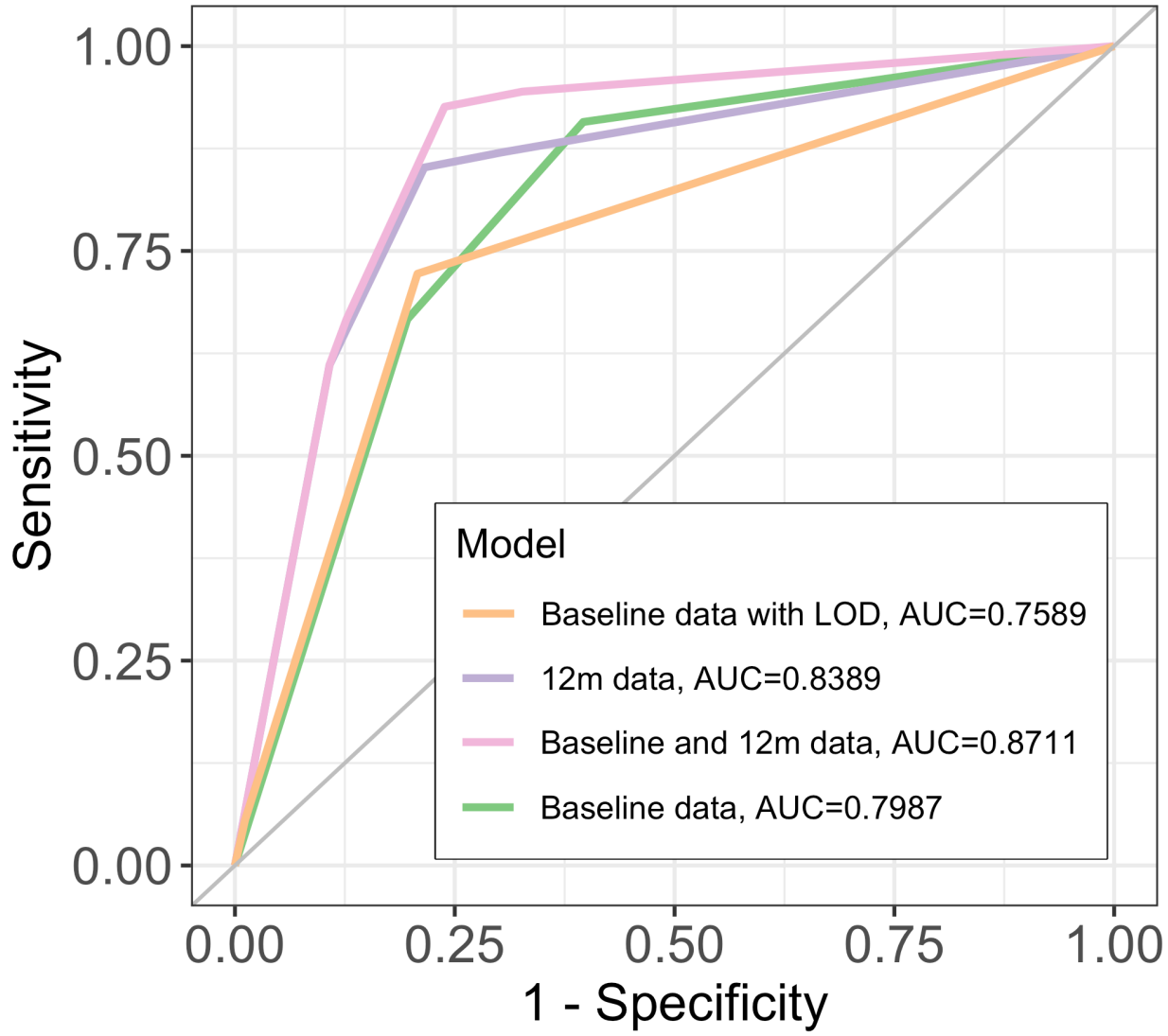
Cincinnati Children's changing the outcome together | University of CINCINNATI

Baseline and 12-months model: Variable selection and CART



Cincinnati Children's changing the outcome together | University of CINCINNATI

Using a greater LOD for sIgE values leads to a reduced AUC when modeling the baseline data



Cincinnati Children's changing the outcome together | University of CINCINNATI

Summary

- Utilized publicly available data of infants at high-risk for peanut allergy from the LEAP trial to determine risk subgroups and estimated the intervention effect of early peanut introduction for each risk subgroup.
- Infants with baseline peanut sIgE ≥0.22 kU/L benefited the most from the early introduction of peanut with an absolute reduction of 40% for the risk of peanut allergy at age 60 months.
- The intervention effects were significant across all risk subgroups in our model using real-world limit of detections for sIgE.
- These results are relevant for further risk assessment and clinical decision-making, including to address early dietary peanut introduction hesitancy.

Limitations and considerations

- These models were built on and apply only to infants as eligible for the LEAP trial (i.e. infants at high risk for developing peanut allergy).
- Limited number of infants with peanut allergy at 60 months of age.
- A prevention study like the LEAP trial has smaller intervention effects due to the dilution effect.
- Only peanut allergy at 60 months of age can be predicted with the given data.

Questions?

Acknowledgments

- Bin Huang
- Yuxiang Li
- Ashley Devonshire
- Tingting Qiu
- Justin Schwartz

We thank the study investigators for making the individual participant level data from the LEAP trial available on ITN TrialShare

Funding: NIH (UH2AI145837, 2KL2TR001426-05A1), CCHMC RIP

Cincinnati Children's changing the outcome together | University of CINCINNATI