

[Session1. 코로나 팬데믹 이후 무엇이 달라졌나?]

# 코로나 팬데믹 이후 소아 알레르기질환의 변화

안강모

성균관 의대 소아청소년과

2024 KAAACI 교육강좌 (2024.3.17)



## 코로나 팬데믹 이후 소아알레르기질환의 변화

안 강 모

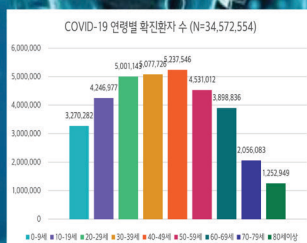
성균관 의과대학 삼성서울병원 소아청소년과 교수  
AAIR 편집위원장

## 이해관계 선언

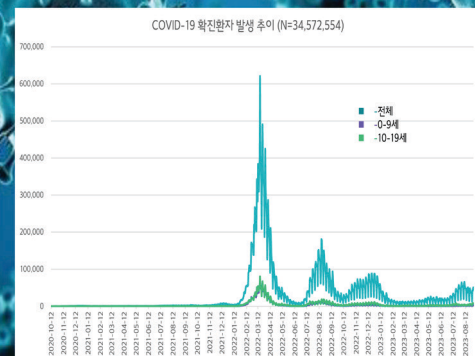
- 이용주, 김효빈, 지혜미, 이은, 서동인, 김지현, 전유훈, 이소연, 양현중, 김우경, 안강모 (저자전부)는 본 발표 내용에서 다음과 같은 이해관계의 내용이 있음을 밝힙니다.
- 본 연구는 질병관리청 연구용역사업 연구비를 지원받아 수행되었습니다(2021-11-034). 그 외 다른 이해관계에서 문제가 없음을 밝힙니다.

### COVID-19 국내 발생 현황 (2020.1.20-2023.8.31)

누적인원(명)	국내발생(명)	해외유입(명)	사망(명)
34,572,554	34,492,629	79,925	35,605



### COVID-19 국내 발생 현황 (2020.1.20-2023.8.31)



**The International Study of Asthma and Allergies in Childhood**

**ISAAC News**

**Phase One Individual data released**

The ISAAC Phase One and Three summary data which has now been published in ISAAC website papers is publicly available on the ISAAC website.

<http://www.isaac.ac.uk/phaseone/individualdata>

**Phase One and Three summary data released for all centres**

The ISAAC Phase One and Three summary data which has now been published in ISAAC website papers is publicly available for all 227 Phase Three centres at <http://www.isaac.ac.uk/phaseone/summarydata> and for all 100 Phase One centres at <http://www.isaac.ac.uk/phaseone/summarydata>

**Auckland Medical Research Foundation Public Lecture**

Professor Peter Taylor will be invited to contribute an editorial in The International Journal of Tuberculosis and Lung Disease (IJTLD), as part of his ISAAC Day.

<http://www.isaac.ac.uk/phaseone/summarydata>

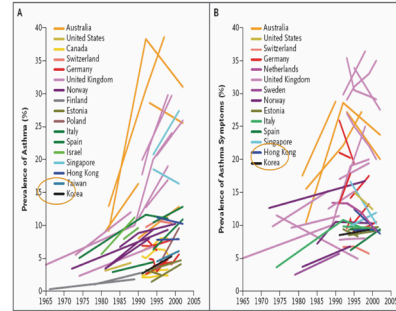
**ISAAC Editorial in The IUTLD**

Professor Peter Taylor was invited to contribute an editorial in The International Journal of Tuberculosis and Lung Disease (IJTLD), as part of his ISAAC Day.

<http://www.isaac.ac.uk/phaseone/summarydata>

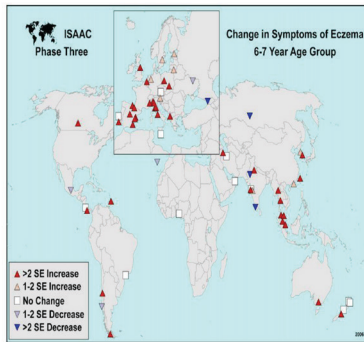
**Latest ISAAC Newsletter**

## Changes in the prevalence of diagnosed asthma and asthma symptoms over time in children and young adults



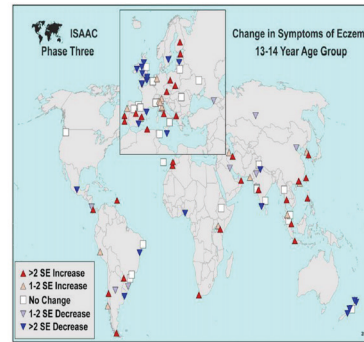
(New Engl J Med 2006;355:2226-35)

## World maps of flexural eczema symptoms in the last year showing changes in the prevalence of eczema symptoms for 6-7-year-olds



(J Allergy Clin Immunol 2008;121:947-54)

## World maps of flexural eczema symptoms in the last year showing changes in the prevalence of eczema symptoms for 13-14-year-olds



(J Allergy Clin Immunol 2008;121:947-54)

## ISAAC: National Coordinator (PI)

<b>1995 Lee SI</b> Dpt of Pediatrics, Samsung Medical Center, Sungkyunkwan University School of Medicine	<b>2000 Lee HB</b> Dpt of Pediatrics, Hanyang University College of Medicine	<b>2010 Kwon HJ</b> Dpt of Preventive Medicine, Dankook University College of Medicine	<b>2022 Kim WK</b> Dept of Pediatrics, Inje University College of Medicine
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## Purpose of survey

1995	• Phase one • Nationwide, Prevalence (Asthma, AR, AD), SPT
2000	• Phase two, Phase three • Nationwide, Prevalence (Asthma, AR, AD), Risk factor analysis
2010	• Phase three • Nationwide, Prevalence (Asthma, AR, AD, FA), Risk factor analysis, SPT
2022	• Phase three • Nationwide, Prevalence (Asthma, AR, AD, FA), Risk factor analysis

## 소아청소년 알레르기질환의 전국적 역학조사 비교

	1995	2000	2010	2022
지역	서울, 지방8개 도시 (안산, 울산, 수원, 창원, 청주, 춘천, 전주) (urban/rural 기준)		서울, 부산, 대구, 인천, 광주, 대전, 울산, 강원, 충북, 충남, 전북, 전남, 경북, 제주 (권역, 도시 규모(인구 및 인구비율), 아파트 가구비율 등 기준)	
Sampling	Random sampling		Stratified two-stage cluster sampling	
대상자 연령	초등1-6학년, 중1-3학년		초등1학년, 중1학년	초등 1, 4학년, 중1학년
대상자 숫자	초 25,117명, 중 14,946명	초 27,831명, 중 15,214명	초 4,000명, 중 4,000명	초 8,000명, 중 4,000명
검사 (SPT, PFT, etc.)	yes	no	yes	no
현장 연구 수행	연구자	연구자	연구자	의뢰기관

## 2022년 ISAAC : 목적 및 범위

- 연구자: 이용주, 김효빈, 지혜미, 이은, 서동인, 김지현, 전유훈, 이소연, 양현중, 안강모, 김우경
- 전국 규모의 소아청소년 알레르기질환 역학조사를 시행함으로써 대표성 있고 국제적으로 비교 가능한 지표 산출
- 검사 시행 없이 설문지를 기초로 하되, 전문 설문조사 기관 (한국갤럽) 을 활용하여 역학조사 시행
- 추후 국민건강보험공단의 자료와 연계하여 분석하기 위한 데이터베이스 구축

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## Methods

- September and October in 2022
- 4,000 students from elementary schools (1<sup>st</sup> grade), 4,000 students from elementary schools (4<sup>th</sup> grade) and 4,000 students from middle schools (1<sup>st</sup> grade)
- Stratified two-stage cluster sampling design
  - School stratification: geographic regions, the type of school location (metropolitan cities, urban areas, rural areas), the proportion of households residing in apartment complexes
  - 1<sup>st</sup> stage (school sampling): using a systematic probability proportional to size sampling procedure, with the number of classes in the school serving as the measure of size
  - 2<sup>nd</sup> stage (class sampling): random sampling of two classes within each sample school

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## Methods (모집단 현황)

(2020년 자료)

	초등학교			중학교	
	학교 수	학생 수 (1학년)	학생 수 (4학년)	학교 수 (1학년)	학생 수 (1학년)
서울	602	64,677	69,256	386	73,483
부산	304	24,795	25,968	170	26,414
대구	230	19,322	20,749	124	22,201
인천	253	24,830	26,389	136	27,709
광주	154	13,538	14,738	91	15,540
대전	148	12,607	13,407	88	14,554
울산	120	10,850	11,344	64	11,634
세종	49	4,879	4,929	24	4,588
경기	1,297	121,480	128,355	638	131,720
강원	347	11,186	12,517	163	13,441
충북	258	13,320	14,580	127	14,953
충남	410	18,988	20,310	184	20,709
전북	420	14,432	16,276	210	17,361
전남	428	14,240	15,762	248	16,431
경북	473	20,648	21,466	259	22,346
경남	505	29,984	32,286	264	33,258
제주	113	6,394	6,768	45	6,966
전국	6,111	426,170	455,080	3,221	473,308

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## Methods (표본추출)

시/도	목표 표본				완료 표본			
	초등학교	초등학교	중학교	중학교	초등학교	초등학교	중학교	중학교
	학교 수	학생 수 (초1)	학생 수 (초4)	학교 수	학생 수 (초1)	학생 수 (초4)	학교 수	학생 수 (중1)
서울	21	420	420	10	400	21	397	446
부산	13	260	260	6	240	14	258	264
대구	11	220	220	6	240	13	289	275
인천	13	260	260	6	240	13	256	255
광주	10	200	200	5	200	10	203	215
대전	9	180	180	5	200	12	221	220
울산	8	160	160	4	160	8	131	181
세종	6	120	120	3	120	7	91	108
경기	28	560	560	14	560	30	660	679
강원	9	180	180	5	200	11	181	203
충북	9	180	180	5	200	10	179	176
충남	11	220	220	6	240	13	217	252
전북	10	200	200	6	240	10	223	214
전남	10	200	200	5	200	10	215	198
경북	12	240	240	6	240	10	203	203
경남	14	280	280	7	280	14	273	288
제주	6	120	120	4	160	7	147	144
총합계	200	4,000	4,000	103	4,120	213	4,144	4,321
						103	4,387	

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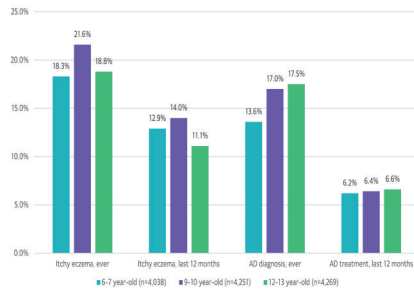
## Methods

- Questionnaires describing basic demographic information, including age, sex, region, urbanization, and monthly income of the family
- Statistical analysis
  - SAS version 9.1
  - Sampling weights for this study to take into account differential selection probabilities, non-response and post-stratification
  - Weighted prevalence rates and 95% confidence intervals were calculated using the SURVEYFREQ procedure

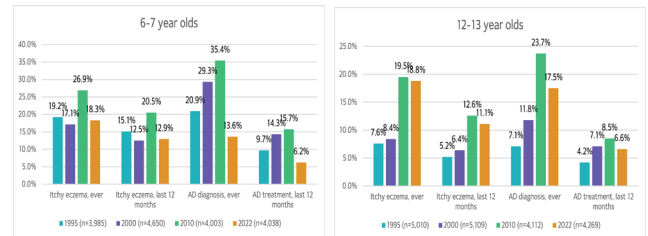
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## Prevalence of AD in 2022



## Prevalence change in AD between 1995 and 2022



## Time trends in the prevalence of AD in Korean children according to age (Allergy Asthma Immunol Res 2022;14(1):123-130)

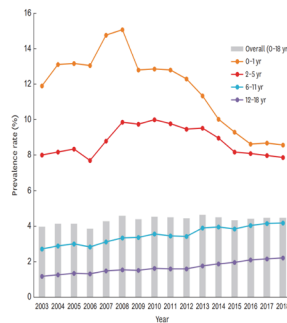


Fig. 1. Time trends in the prevalence of AD in Korean children aged 18 years and under from 2003 to 2018. The change in AD prevalence in each age group from 2003 to 2018 was observed in the following age groups: overall (0-18 years), 0-1 year, 2-5 years, 6-11 years and 12-18 years. AD, atopic dermatitis.

## Time trends in the prevalence of AD in Korean children according to age (Allergy Asthma Immunol Res 2022;14(1):123-130)

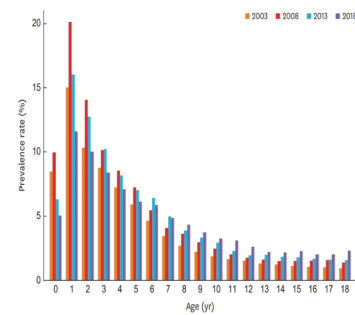


Fig. 2. Comparison of the prevalence of AD by age among the years 2003, 2008, 2013 and 2018. The decreasing rate of AD prevalence by age was different between the years. The prevalence of AD in 2018 was the lowest in infants, whereas it became the highest in school-aged children and adolescents. AD, atopic dermatitis.

## Time trends in the prevalence of AD in Korean children according to age (Allergy Asthma Immunol Res 2022;14(1):123-130)

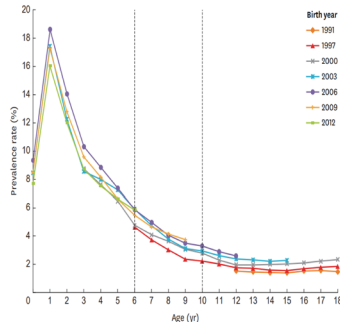
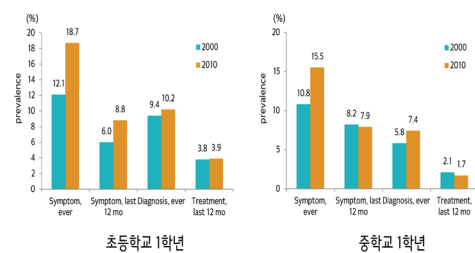


Fig. 3. Comparison of the prevalence of AD by age among children born in 1989, 1997, 2000, 2003, 2006, 2009 and 2012. The prevalence of AD during infancy was different according to the birth year, whereas this difference changed at school age. The decreasing rate of AD prevalence in recently born children was slower than that in children born before 2006. AD, atopic dermatitis.

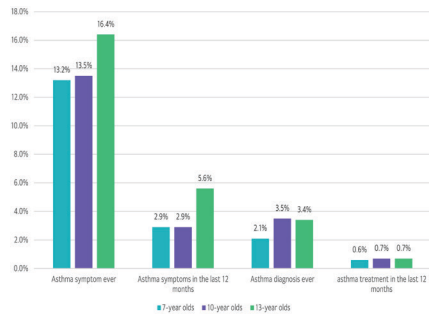
## 2000-2010년 어린이 청소년에서의 알레르기질환 유병률

### 전국 천식 유병률



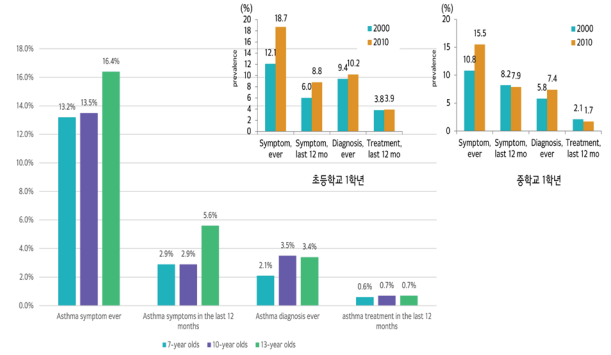
이은, 서동인 등 (2023 KAPARD 추계학술대회)

## Prevalence of Asthma in 2022



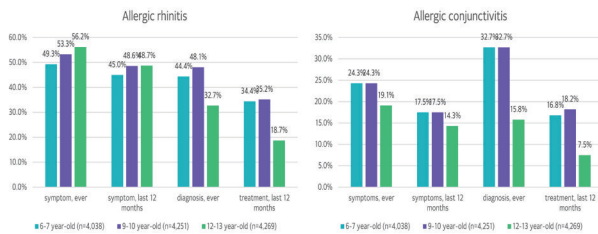
이은, 서동인 등 (2023 KAPARD 추계학술대회)

## Prevalence of Asthma in 2022



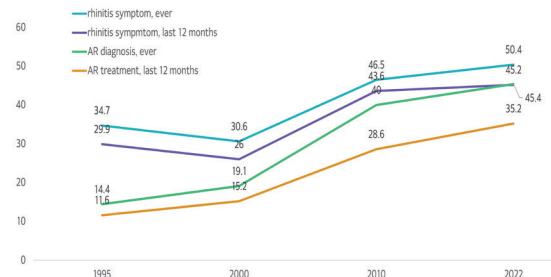
이용주 등 (2023 KAPARD 추계학술대회)

## Prevalence of AR/AC in 2022



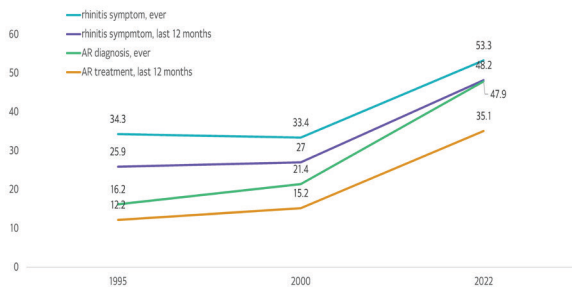
이용주 등 (2023 KAPARD 추계학술대회)

Fig 1. Comparison of AR prevalence rates in 6-7 year-old children between 1995 and 2022



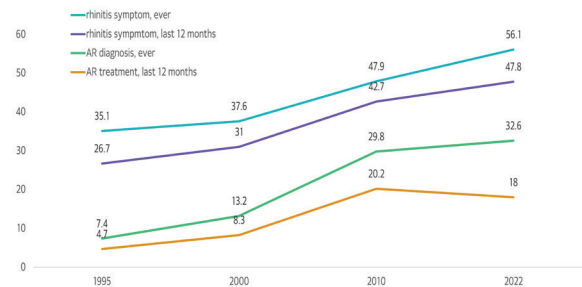
이용주 등 (2023 KAPARD 추계학술대회)

Fig 2. Comparison of AR prevalence rates in 9-10 year-old children between 1995 and 2022



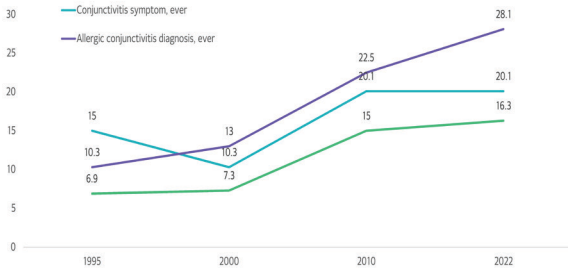
이용주 등 (2023 KAPARD 추계학술대회)

Fig 3. Comparison of AR prevalence rates in 12-13 year-old children between 1995 and 2022



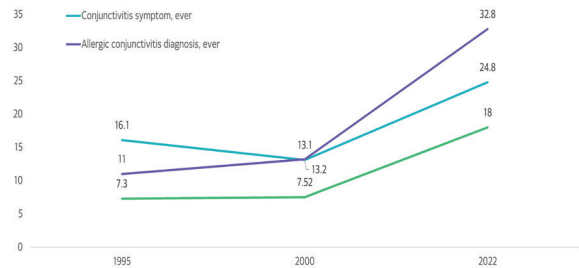
이용주 등 (2023 KAPARD 추계학술대회)

**Fig 4. Comparison of allergic conjunctivitis prevalence rates in 6-7 year-old children between 1995 and 2022**



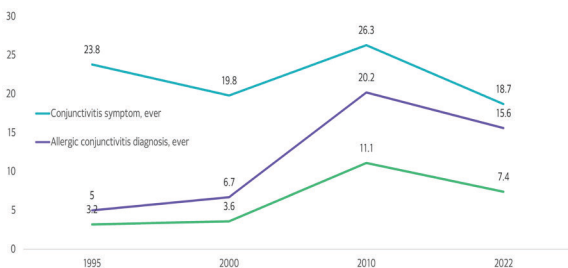
이용주 등 (2023 KAPARD 추계학술대회)

**Fig 5. Comparison of allergic conjunctivitis prevalence rates in 9-10 year-old children between 1995 and 2022**

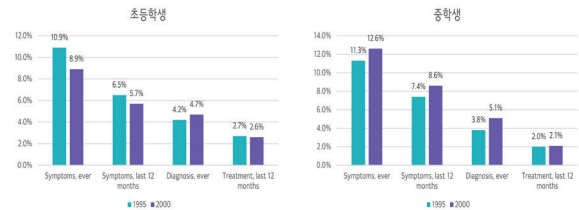


이용주 등 (2023 KAPARD 추계학술대회)

**Fig 6. Comparison of allergic conjunctivitis prevalence rates in 12-13 year-old children between 1995 and 2022**



## Prevalence of FA in 1995 and 2000



## Food allergy

- Study design: a questionnaire-based, cross-sectional study
- Study period: September, 2015
- Study population:
  - 6-7 yr: 1<sup>st</sup> grade of elementary school
  - 9-10 yr: 4<sup>th</sup> grade of elementary school
  - 12-13 yr: 1<sup>st</sup> grade of middle school
  - 15-16 yr: 1<sup>st</sup> grade of high school
- Definition of current immediate-type FA : detailed history

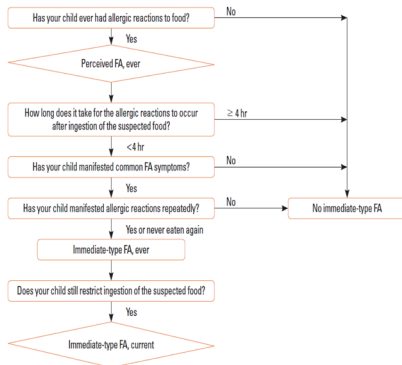
## Food allergy

- Study design:
  - Two-stage stratified random samples from schoolchildren
  - Selection of classes in schools from 17 cities & provinces in Korea

	Population	Representative population
1 <sup>st</sup> grade of elementary school	481,614	17,500
4 <sup>th</sup> grade of elementary school	455,228	17,500
1 <sup>st</sup> grade of middle school	528,977	7,500
1 <sup>st</sup> grade of high school	605,855	7,500
<b>Total</b>	<b>2,071,674</b>	<b>50,000</b>



## Food allergy



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## Food allergy

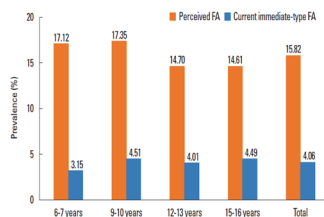
Table 1. Characteristics of participants (n=29,842)

Characteristics	No. (%)
Age (yr)	
6-7	9,671 (32.4)
9-10	9,756 (32.7)
12-13	5,169 (17.3)
15-16	5,246 (17.6)
Sex (male)	15,239 (51.2)
Past history of allergic diseases	
Allergic rhinitis	10,589 (35.7)
Atopic dermatitis	7,214 (25.0)
Asthma	1,352 (4.7)
Response rate by area	
Seoul	3,626 (6,500) (55.8)
Gyeonggi*	6,018 (12,620) (47.7)
Gangwon	1,348 (2,000) (67.5)
Chungcheong†	5,491 (7,660) (71.7)
Jeolla‡	3,213 (6,520) (49.3)
Gyeongang§	9,306 (13,230) (70.3)
Jeju	839 (1,470) (57.1)

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## Food allergy

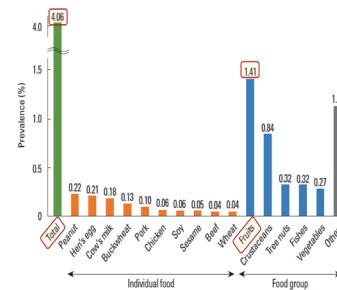


(Kim MJ, et al. Allergy Asthma Immunol Res 2017;9(5):410-416)

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## Causative foods of current immediate-type FA in Korean schoolchildren in 2015 (N=29,842)



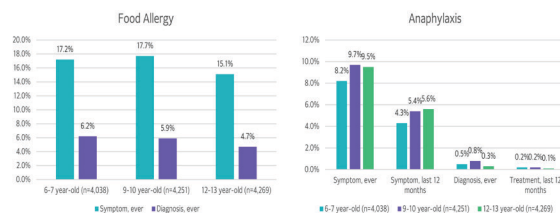
(Kim MJ, et al. Allergy Asthma Immunol Res 2017;9(5):410-416)

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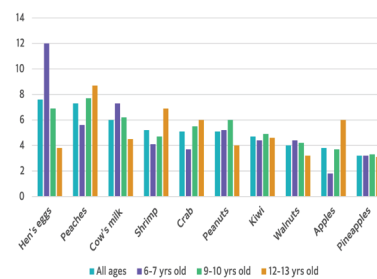
전유훈, 이소연 등 (2023 KAPARD 추계학술대회)

## Prevalence of FA and anaphylaxis

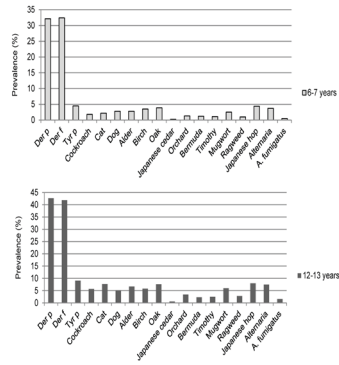


전유훈, 이소연 등 (2023 KAPARD 추계학술대회)

## Causative Foods of Food Allergy in Korean Children



## Prevalence of sensitization to aeroallergen in Korean school children in 2010

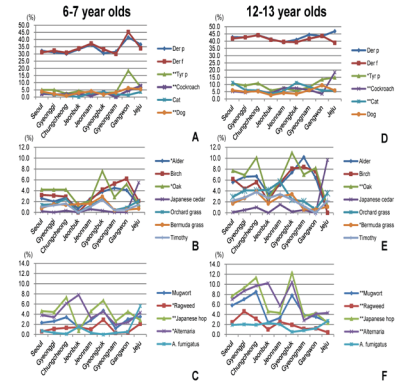


(Kim J, et al. J Korean Med Sci 2011;26:1165-72)

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## Regional difference of sensitization to aeroallergen



(Kim J, et al. J Korean Med Sci 2011;26:1165-72)

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## Take Home Message

우리나라 소아청소년에서의 알레르기질환 현재 유병률 (2022) 및 시간에 따른 변화 추이 (1995-2022)

- AR, FA : 증가
- AD, asthma: 감소 (?)

## 감사의 글

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