

# Reference Values for The Triglyceride to High-Density Lipoprotein Cholesterol Ratio and Non-High-Density Lipoprotein Cholesterol in Korean children and adolescents: The Korean National Health and Nutrition Examination Surveys 2007-2013



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## INTRODUCTION

### Non-conventional lipid profiles

- Predictors of cardiovascular events
- **Non-high-density lipoprotein cholesterol (non-HDL-C)**
  - All atherogenic cholesterol
  - low-density lipoprotein (LDL), lipoprotein (a), intermediate-density lipoprotein (IDL), and very-low-density lipoprotein (VLDL) remnants
- **Triglyceride to HDL-C ratio (TG/HDL-C ratio)**

### The aim of this study

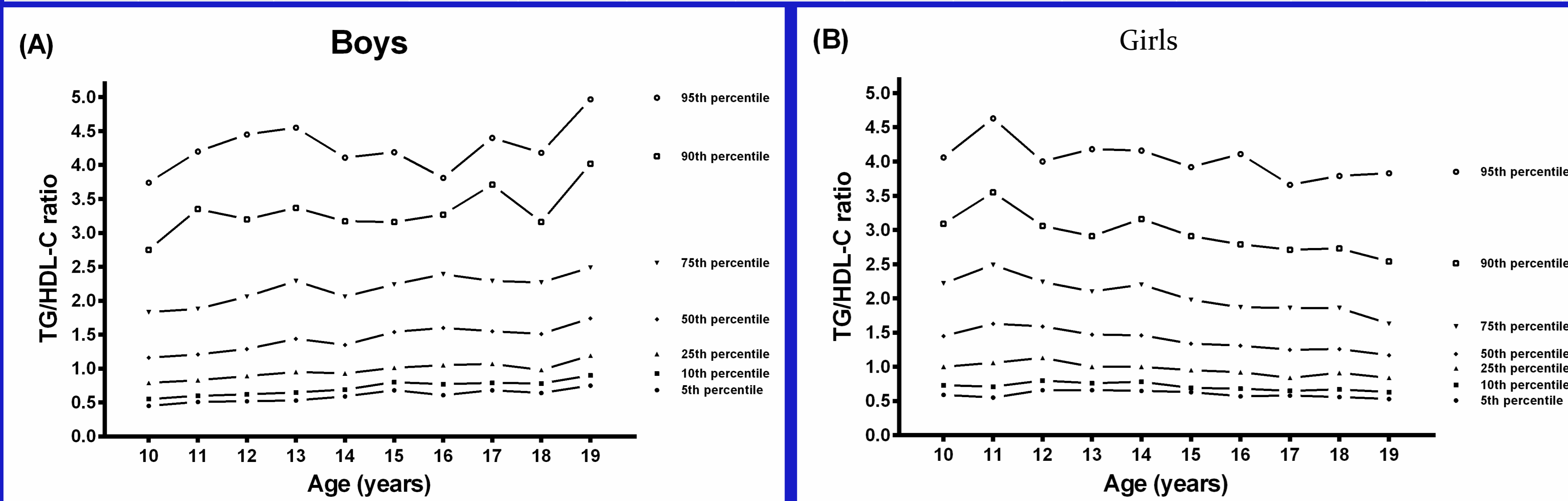
- To evaluate and identify age- and gender-specific reference values for serum lipids, including total cholesterol (TC), HDL-C, TG, LDL-C, non-HDL-C and the TG/HDL-C ratio, in a normal population of Korean children and adolescents.

## SUBJECTS & METHODS

- Data from the Korean National Health and Nutrition Examination Survey (KNHANES) from 2007-2013
- 6197 subjects (3260 males, 2937 females)
- Calculations
  - Non-HDL-C: TC – HDL-C
  - LDL-C: TC – HDL-C – TG/5 (all subjects: TG < 400 mg/dL)
- Dyslipidemia
  - hyper-TC concentration (TC ≥ 200 mg/dL)
  - hypo-HDL-C concentration (HDL-C < 40 mg/dL)
  - hyper-TG concentration (TG ≥ 130 mg/dL)
  - hyper-LDL-C (LDL-C ≥ 130 mg/dL)
  - hyper-non-HDL-C (non-HDL-C ≥ 145 mg/dL)

## RESULTS

Boys (N=3260)	Mean	SD	Percentile							Girls (N=2937)	Mean	SD	Percentile						
			5	10	25	50	75	90	95				5	10	25	50	75	90	95
Total cholesterol (mg/dL)	155.0	27.0	115	123	137	153	171	190	202	Total cholesterol (mg/dL)	162.6	25.7	124	132	145	161	178	196	209
High-density lipoprotein cholesterol (mg/dL)	51.7	10.8	36	39	44	51	58	66	71	High-density lipoprotein cholesterol (mg/dL)	54.6	11.0	38	41	47	54	62	68	73
Triglyceride (mg/dL)	84.1	48.3	34	39	52	72	101	144	180	Triglyceride (mg/dL)	86.3	45.0	37	44	56	76	104	140	171
Low-density lipoprotein cholesterol (mg/dL)	86.5	23.4	52	59	71	84	100	116	126	Low-density lipoprotein cholesterol (mg/dL)	90.7	22.4	58	64	75	89	104	120	131
Non-high-density lipoprotein cholesterol (mg/dL)	103.3	26.1	66	73	85	101	119	136	150	Non-high-density lipoprotein cholesterol (mg/dL)	107.9	24.7	72	79	91	105	122	140	153
Triglyceride to high-density lipoprotein cholesterol ratio	1.77	1.25	0.57	0.68	0.94	1.44	2.17	3.25	4.20	Triglyceride to high-density lipoprotein cholesterol ratio	1.72	1.22	0.60	0.71	0.97	1.40	2.04	3.04	4.04



**Figure:** The TG/HDL-C ratio tended to increase with age in boys (A), whereas the trend in TG/HDL-C ratio was decreasing with age in girls (B).

## CONCLUSIONS

- This study on the distribution of serum lipid concentrations in Korea demonstrated age- and gender-specific reference values of serum lipid profiles including non-HDL-C and TG/HDL-C ratios in children and adolescents based on a nationwide survey.
- These results provide not only more information for individualized interpretation of lipid profiles and interventions but also valuable information for planning strategies to prevent and manage childhood and adolescent dyslipidemia.

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