

Design and Recruitment of a Longitudinal Cohort Study of Growth and Puberty in Russian Boys

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Statement of Disclosure

All study authors have no actual or potential competing financial interests and the authors' freedom to design, conduct, interpret, and publish this research is not compromised by any controlling sponsor as a condition of review and publication.

Background

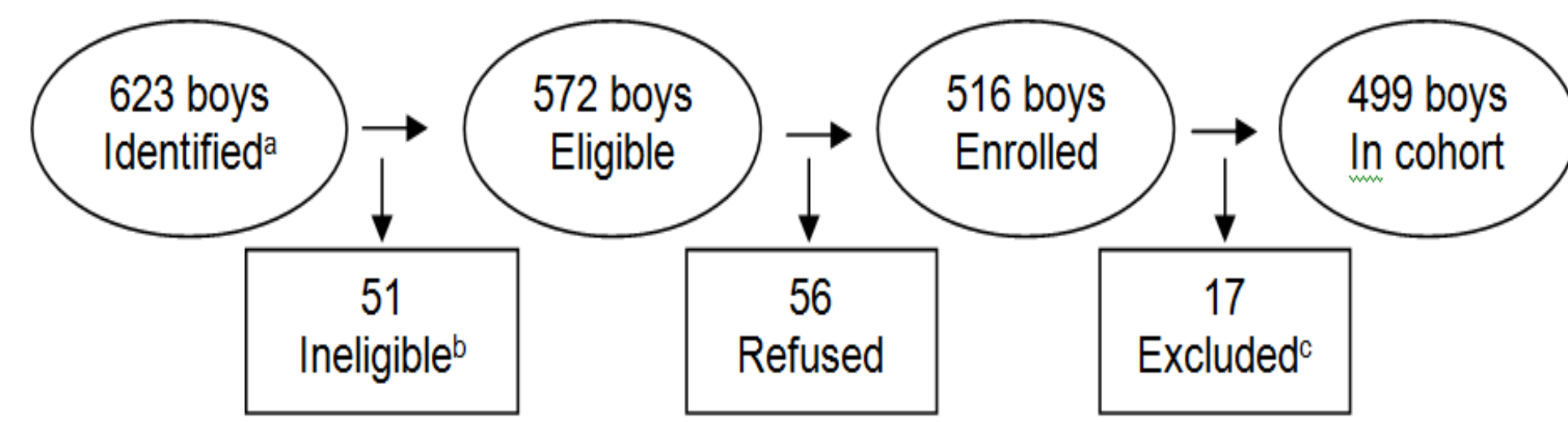
Few longitudinal male cohort studies include serial assessments of growth and pubertal development.

Objective

- To describe the design and implementation of a longitudinal cohort study of Russian boys evaluated annually for growth, development and puberty.
- To present serial anthropometric and pubertal measures and z-scores in this cohort from ages 8-18 yrs.

Study population at enrollment

Recruitment flow diagram for boys in Russian Children's Study



^aused town records; ^bdead, moved, not born in Chapaevsk, likely to relocate, or chronic illness; ^cidentified post-enrollment as orphans

- Recruitment rate: (516/572) ~ 90% of all eligible 8- to 9-year old boys in Chapaevsk, Samara region, Russia (2003-2005)
- Baseline and annual examinations generally in birth month

Methods

- The study was approved by the Human Studies Institutional Review Boards of the Chapaevsk Medical Association (Chapaevsk, Russia); HSPH and BWH (Boston, MA, USA), and UMass Medical School (Worcester, MA, USA).

Growth Outcomes:

- 23 anthropometric indices were measured at annual visits using NHANES III video¹ and Lohman² references, as well as an additional 30 measures conducted biennially.

Anthropometric Indices	Biennially
Height, weight	2
Segment lengths, height of landmarks	11
Breadths (diameters)	9
Circumferences	16
Skinfolds	15
TOTAL Anthropometric Indices	53

Pubertal Outcomes:

- Pubertal status was assessed by Tanner³ staging of pubic hair (P) and genitalia (G), and by measurement of testicular volume (TV) using an orchidometer.

Statistical analysis:

- Age-adjusted, standardized z-scores for height and BMI were calculated using WHO⁴ Growth Standards.
- Descriptive statistics were computed using Stata 13.

Consistency of techniques and staff

For all study visits:

- Same nurse (LS) for anthropometric measurements
- Same physician (OS) for pubertal assessment
- Same brand and model for measurement equipment

References

- NHANES III Anthropometric Procedures Video from the NCHS, 2000 http://www.cdc.gov/nchs/nhanes/nhanes3/anthropometric_videos.htm
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Acknowledgments

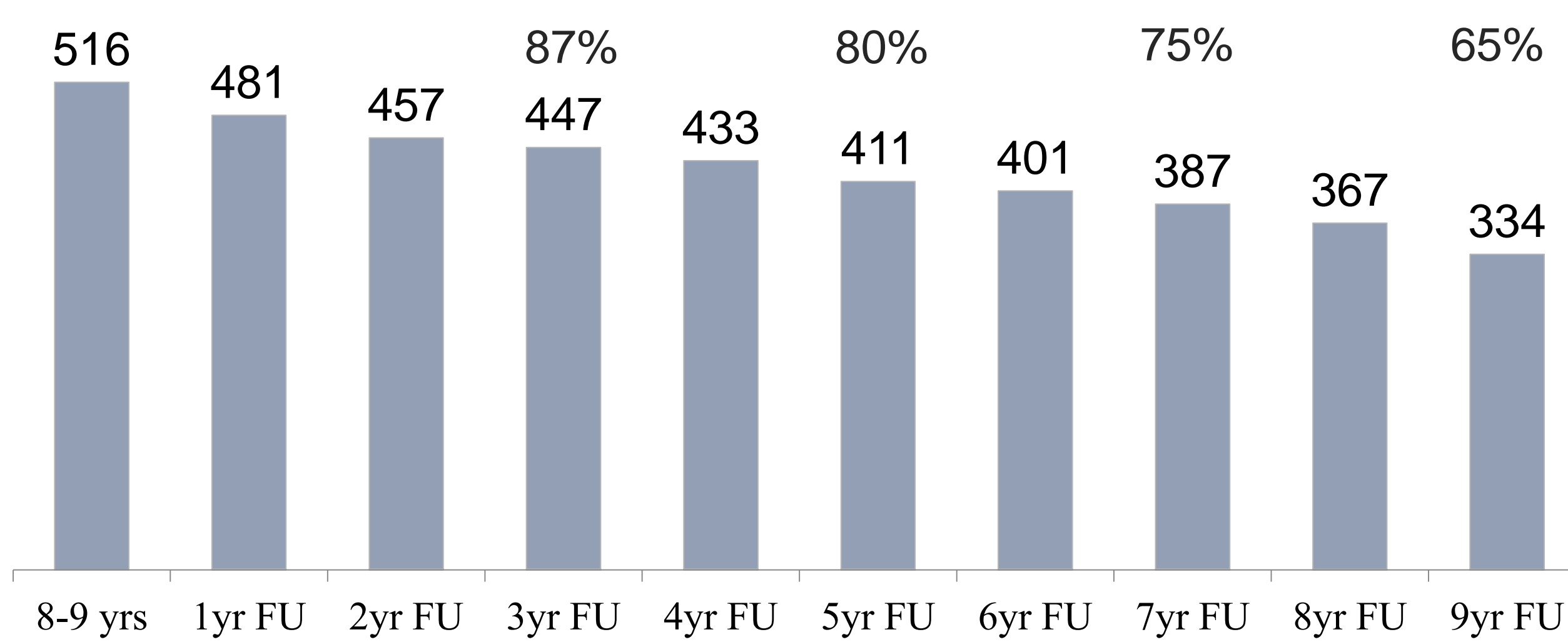
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Results

Follow-up characteristics

Figure 1. Retention rate for FU, over 11 years, 2003-2014



- High retention rate over 11 years - 65%
- > 4370 visits during follow-up
- 20 000 sample aliquots (blood, serum, clots, urine, semen)
- > 1000 variables birth, life-style, nutrition, socio-economic, parents health & occupational history

Trends for WHO height and BMI z-scores

Figure 2. Trend for WHO standardized Z-scores for height by age

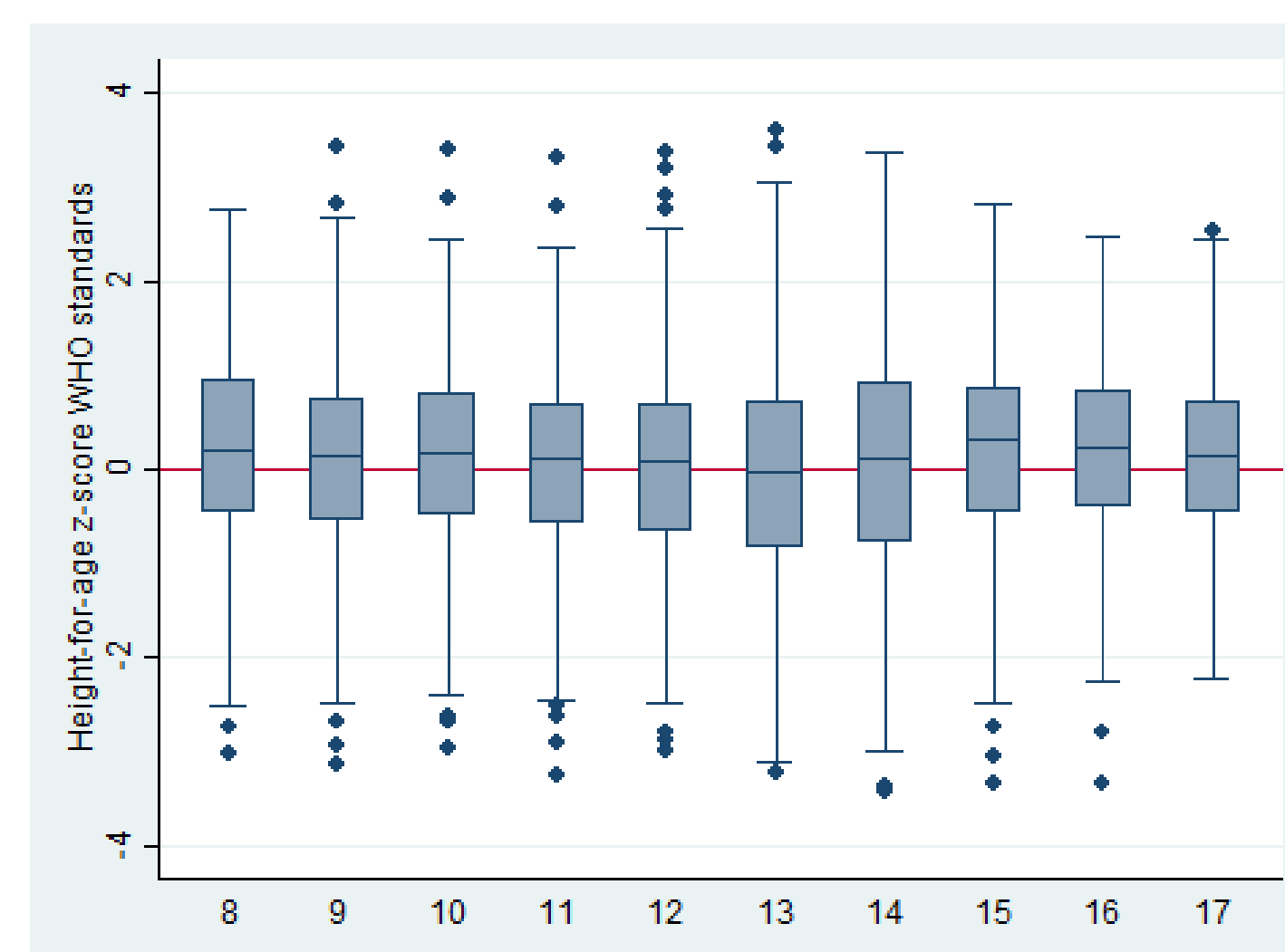
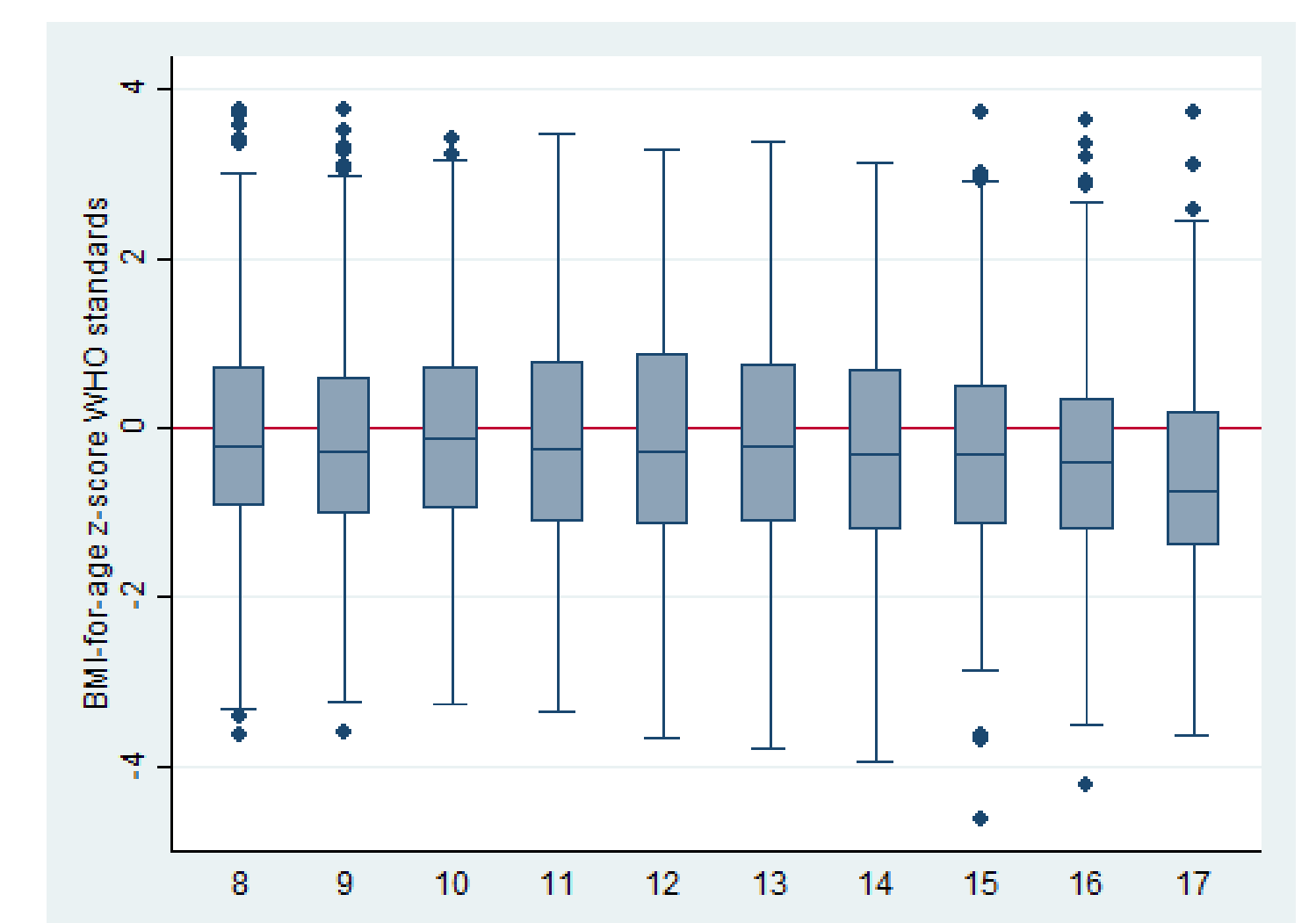


Figure 3. Trend for WHO standardized Z-scores for BMI by age



Trends for anthropometric and pubertal measures by age

Figure 4. Trend for segment lengths and circumference

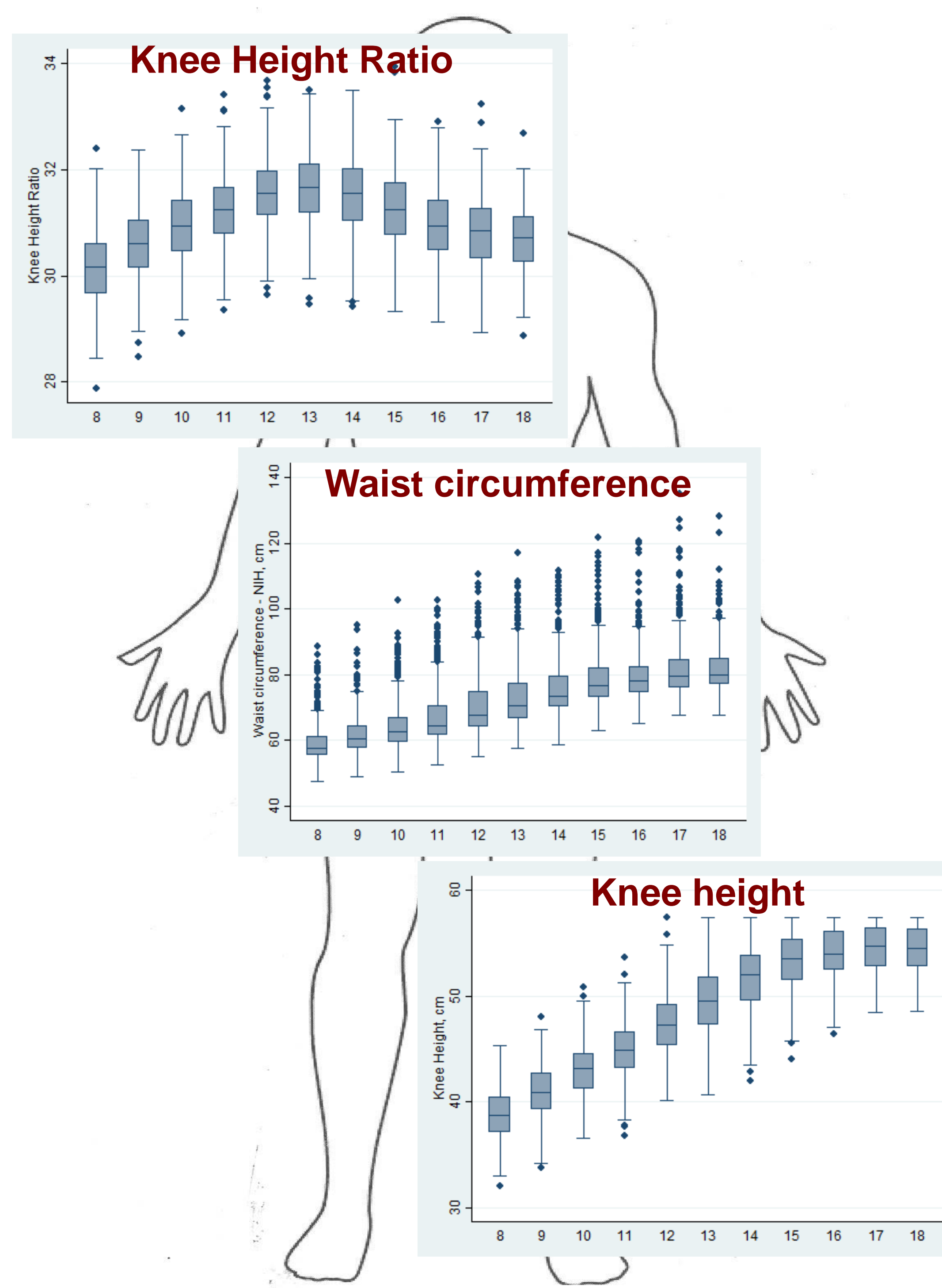


Figure 5. Trend for skinfolds by age

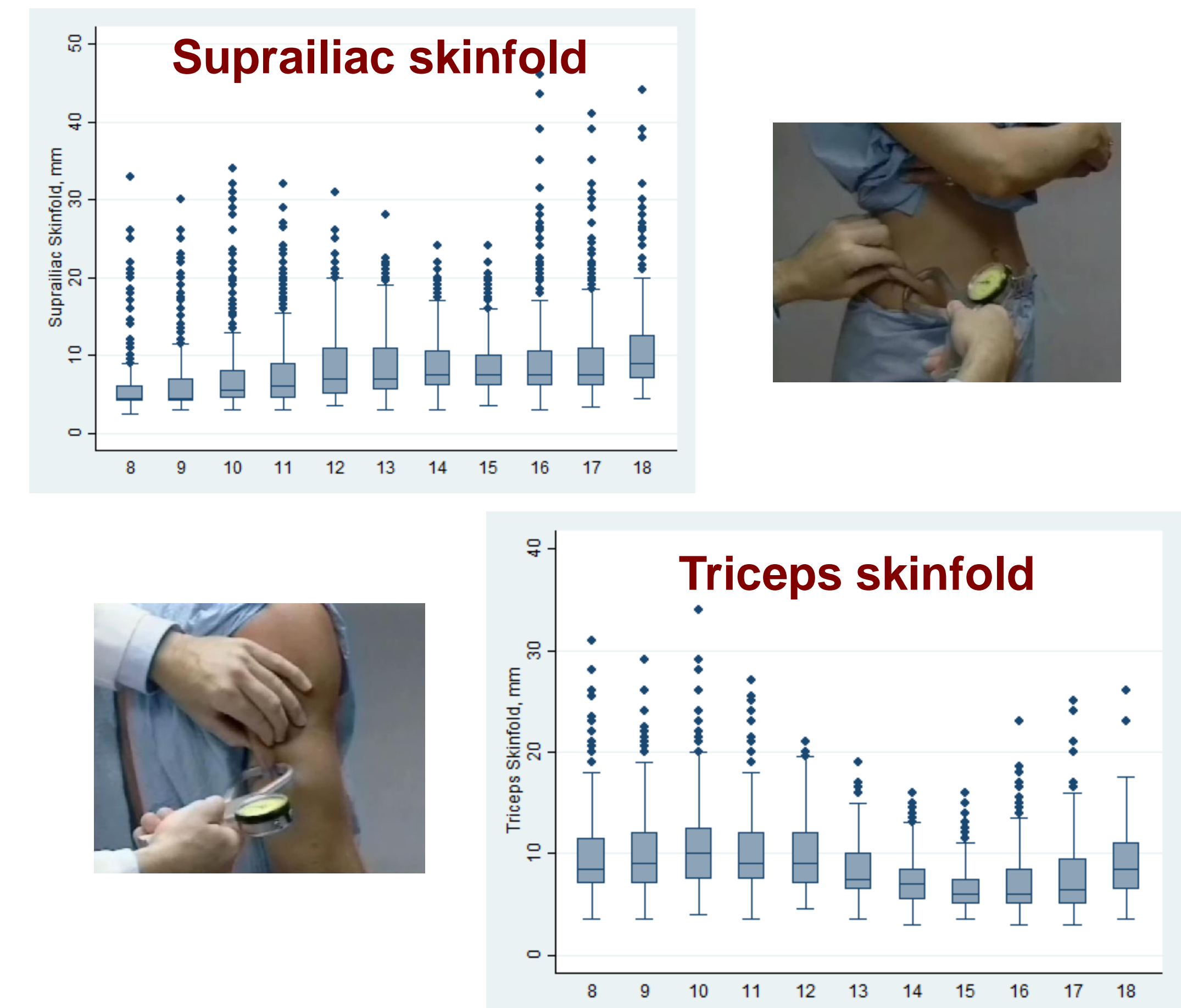
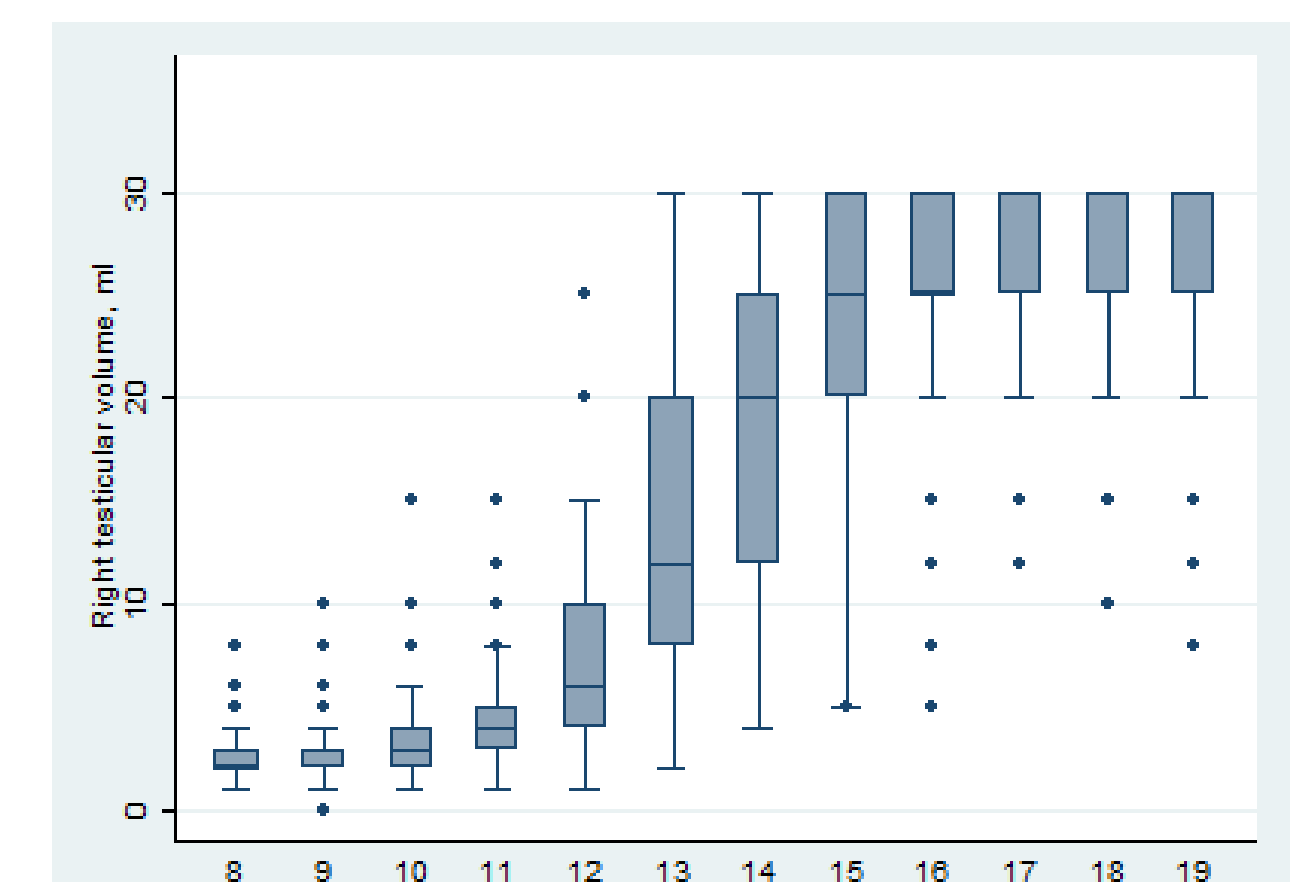


Figure 6. Trend for testicular volume by age



In Summary

Large longitudinal cohort study of male growth, development, puberty and reproductive health.

Thus far we have collected data and samples for > 11 years, from ages 8-19 years with ongoing follow-up and data collection.

Preliminary descriptive analysis of anthropometric and pubertal measures by 8-18 years

Conclusions

To our knowledge, this longitudinal male cohort is the first to be followed for over ten years, from prepuberty to young adulthood with annual comprehensive assessments of growth and puberty.

Moreover, the study examinations were performed by the same physician and nurse throughout the duration of the study.

This cohort provides an excellent foundation for describing growth and pubertal development trajectories and evaluating associations with environmental exposures

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