OBJECTIVE
To evaluate the extent to which pubertal timing alters the classification of extremes of attained stature across race-ethnic groups of US youths.

METHODS
We performed analyses of anthropometry and Tanner staging data of 3206 cross-sectional national sample of youths ages 8–18y (53% male (n=1606), 72% Non-Hispanic White (NHW), 9% Mexican American (MA) and 19% Non-Hispanic Black (NHB). Specialized Tanner-stage-age growth models were used to derive Tanner-age adjusted Z-scores. The prevalence of short (<-1SD) and tall (>=1SD) status was quantified after adjustment for Tanner stage-age height Z-scores (TSA_{HAZ}). We then examined average growth patterns with age splines across estimated Z-scores by sex and race/ethnicity.

RESULTS
Highly variable patterns of prevalence of shortness and tallness via chronologic-age height Z-score (CA_{HAZ}) was observed in results stratified by Tanner stages, race-ethnicity and sex. Tallness CA_{HAZ} prevalence was high among NHW and NHB males relative to MA (40.0 – 43.3, vs 20.5%) and in females, the ranking was (39.2% NHB > NHW 29.6 > MA 20.3, each p =0.0167). In both sexes, this pattern was eliminated with TSA_{HAZ}, with MA youth becoming statistically not different from their NHW and NHB peers on both stature indicators.

CONCLUSION
• Differences in timing of puberty between race-ethnic groups affects estimated prevalence of shortness and tallness of attained height.
• Considerable pubertal maturation effects remain uncaptured with age-conditioned height Z-scores.
• Adjustment for pubertal development might help isolate crucial determinants of attained stature and other aspects of body composition which may be most responsive to intervention programs in populations of youths.
• Development of Tanner Stage Height-for-Age (TSA Height) Curves may be useful for evaluating children with normal and pathologic variants of growth and pubertal timing.
• Adjustment for pubertal status may be useful in evaluating other auxologic parameters and assessing body composition and bone mineral density.

REFERENCES