Maxillary and mandibular arch widths of Colombians

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Abstract
This study provides reference data and evaluates the potential of using regression models to predict maxillary and mandibular arch widths.

Methods
A total of 473 Colombian mestizos, aged 5 to 17 years, with normal occlusions and malocclusions (Class I and Class II Division I) were evaluated. Arch widths and tooth sizes were measured on each subject's dental casts. Anthropometric measurements of body size, facial breadth, and facial height were used, along with tooth sizes, to develop multiple regressions for predicting arch widths.

Results
Analyses showed that Class II subjects had significantly ($P < 0.05$) narrower anterior maxillary widths than those with normal occlusion or Class I malocclusion. Class I subjects had narrower intermolar widths than those with normal occlusion or Class II malocclusion. Boys had significantly $P < 0.001$ wider arches than girls, especially in the posterior aspects. Older children had significantly wider arches than younger children, with intermolar and interproparmolar widths having the largest and smallest age effects, respectively. Regression analyses of subjects with normal occlusion showed that 2 to 5 variables combined to explain 36% to 64% of the variation in arch widths, with the sizes of the maxillary incisors and bicuspid width explaining most of the variation.

Conclusions
When applied to subjects with malocclusion, the predictions indicate transverse deficiencies in the premolar region of Class I subjects and deficiencies in the anterior maxilla of Class II subjects. Predictions based on Punt's index, the Schwarz analysis, or the Meckel rule of thumb were biased and less reliable than those based on the regressions.
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