model to a random-effect model would generate no change in the conclusions.

Second, owing to the commonly found considerable heterogeneity across studies and a chief aim to merely provide pooled prevalence, many MCPs reported subgroup differences only in a descriptive manner rather than ambitiously giving the statistical significance of the differences.[2,3] According to Higgins and Green,[4] nonoverlap (and even overlap to a small degree) of the confidence intervals of the summary estimates is an indication of statistical significance. To avoid exaggeration, we used this relatively conservative method to estimate the rough degree of differences while describing them.

As for publication bias, previous MCPs either made no mention or provided only an overall value of relevant statistics for all included studies (same as what we did).[5-7] Actually, the chief concern for publication bias was that studies with negative results are less likely to be published. However, results of epidemiologic surveys concerning prevalence could not be considered either positive or negative. Furthermore, a previous study has shown that study size was not consistently associated with the probability of publication.[4] Thus, to MCPs, the importance of publication bias and the traditional methods to estimate it might not be absolutely applicable. Conversely, information bias, selection bias, and performance bias have been highlighted for MCPs, all of which we endeavoured to avoid and evaluate in our analysis.[5,7]

For the last 3 or 4 years, MCPs have been rapidly gaining the interest of researchers. The elimination of inconformity and the improvement of quality of future MCPs might be one task that the Cochrane Collaboration could undertake before its 25th anniversary!

Fang Hua
Hong He
Wassim Bouzid
Wuhan, China

Peter Ngan
Morgantown, WVa

Am J Orthod Dentofacial Orthop 2013;144:497-8
0889-5406/$36.00

http://dx.doi.org/10.1016/j.ajodo.2013.08.008

REFERENCES

1. Stroup DF, Berlin JA, Morton SC, Olkin I, Williamson GD, Rennie D, et al. Meta-analysis of observational studies in epidemiology: a proposal for reporting. Meta-analysis of Observational Studies in Epidemiology (MOOSE) group. JAMA 2000; 283:2008-12.
2. Liu B, Wang T, Zhao HN, Yue WW, Yu HP, Liu CX, et al. The prevalence of hyperuricemia in China: a meta-analysis. BMC Public Health 2011;11:832. Available at: http://www.biomedcentral.com/1471-2458/11/832.
3. Hong Y, Huang X, Ling H, Liao H. Prevalence and trend of HIV infection among voluntary blood donors in China since implementation of the blood donation law: a systematic review and meta-analysis. Trop Med Int Health 2012;17:978-88.
4. Higgins J, Green S. Cochrane handbook for systematic reviews of interventions. Version 5.1.0. The Cochrane Collaboration 2011.
5. Polder BJ, Van't Hof MA, Van der Linden FP, Kuijpers-Jagtman AM. A meta-analysis of the prevalence of dental agenesis of permanent teeth. Community Dent Oral Epidemiol 2004; 32:217-26.
6. Hwang CK, Han PV, Zabetian A, Ali MK, Narayan KM. Rural diabetes prevalence quintuples over twenty-five years in low- and middle-income countries: a systematic review and meta-analysis. Diabetes Res Clin Pract 2012;96:271-85.
7. Papadopoulos MA, Chatzoudi M, Kaklamanos EG. Prevalence of tooth transposition. A meta-analysis. Angle Orthod 2010;80: 275-85.

The null hypothesis

The null hypothesis is the proposition that implies no effect or no relationship between phenomena. It is a hypothesis that the researcher tries to disprove, reject, or nullify, whereas the alternative hypothesis is what the researcher really thinks is the cause of a phenomenon.[1]

In the article "Evaluation of skeletal and dental asymmetries in Angle Class II subdivision malocclusions with cone-beam computed tomography," the authors presented 2 null hypotheses.[2] The first was that no significant difference exists between the Class II and Class I sides for the skeletal and dental measurements of Class II subdivision malocclusions. The second hypothesis was that there would be no significant difference in skeletal or dental measurements between the 2 sides when Class II subdivision malocclusions were separated into a noncrowded group with minimal or no dental crowding and a crowded group with moderate to severe dental crowding. Thus, the purpose of their study was to determine whether Angle Class II subdivision malocclusions have skeletal or dental asymmetries between the Class II and Class I sides. The null hypothesis is often the reverse of what the experimenter actually believes; it is put forward to allow the data to contradict it. However, in this particular case, rejection of 1 null hypothesis was already evident before the study began, because the authors recognized in their introduction that "there is asymmetry between the right and left sides of the dentition…. The etiology of the asymmetry can be quite complex. It could be dental related, skeletal related,

or a combination of both…. These studies showed that the differences between the 2 sides were primarily dentoalveolar."[2]

We believe that the great merit of their study was to evaluate skeletal structures with cone-beam computed tomography in a way that was not possible before with 2-dimensional images. The ability of this technique to show spatial relationships in 3 dimensions helps the orthodontist to diagnose the relative location of the anatomic parts of the craniofacial complex.[3] The conclusion that "there were significant skeletal and dental differences between the Class I and Class II sides" included the skeletal component in the dentoalveolar asymmetries, which have already been widely studied and discussed. Perhaps that is the most appropriate null hypothesis to be used: the role of skeletal asymmetries in the development of the Class II subdivision malocclusion.

Robert W. F. Vitral
Marcio J. S. Campos
Marcelo R. Fraga
Minas Gerais, Brazil

Am J Orthod Dentofacial Orthop 2013;144:498-9
0889-5406/$36.00

http://dx.doi.org/10.1016/j.ajodo.2013.08.010

REFERENCES

1. Shuttleworth M. Null hypothesis. Available at: Explorable.com: http://explorable.com/null-hypothesis. Accessed July 3, 2013.
2. Minich CM, Araújo EA, Behrents RG, Tanaka OM, Kim KB. Evaluation of skeletal and dental asymmetries in Angle Class II subdivision malocclusions with cone-beam computed tomography. Am J Orthod Dentofacial Orthop 2013;144:57-66.
3. Kokich V. Cone-beam computed tomography: have we identified the orthodontic benefits? Am J Orthod Dentofacial Orthop 2010; 137(Suppl):S16.

Authors' response

We want to thank Robert Vitral, Marcio Campos, and Marcelo Fraga for their interest and feedback regarding our research. They analyzed our 2 null hypotheses and stated that 1 was already rejected before the study began.

The null hypothesis in question was "that no significant difference would exist between the Class II and Class I sides for skeletal and dental measurements of Class II subdivision malocclusions." From previous studies, it has been shown that there are significant differences in dental measurements, but for skeletal measurements it has been unclear. It could be related to the dentition, the skeleton, or a combination of both. The word "could" is the key to this statement. Skeletal discrepancies could play a role, but based on previous studies they have not been shown to be significant unless there was an underlying craniofacial syndrome (which we excluded from our sample).

Vitral and his colleagues also mentioned that "the skeletal component in the dentoalveolar asymmetries has already been widely studied and discussed." The previous studies referenced in our introduction used different methodologies to examine Class II subdivision malocclusions with 2-dimensional radiography and measurements. These studies showed tendencies toward skeletal differences but no statistically significant differences. The studies did not quantify how much of the overall asymmetry was caused by dental vs skeletal asymmetries. The skeletal component has been looked at before, but the previous authors suggested that the skeletal aspects should be investigated more in depth.

Vitral and his colleagues were correct in stating that "the great merit of our study was to evaluate skeletal structures with cone-beam computed tomography." We were expecting to see dental differences in our measurements but still decided to include the dental aspect in our null hypothesis for 2 reasons: first, to test whether our new methodology with cone-beam computed tomography and 3-dimensional measurements would confirm the dental differences shown in the previous studies (ie, validation), and second, to be able to quantify how much of the total discrepancy is derived from dental asymmetry vs skeletal asymmetry. We do not disagree that we could have formulated a null hypothesis on skeletal asymmetries alone, but since we were using a different methodology, and also to make the study more complete, we decided to incorporate the dental asymmetries as well.

The only other study that shows significant skeletal asymmetries in Class II subdivision malocclusions is by Sanders et al[1] in 2010. They also used cone-beam computed tomography to analyze this malocclusion and showed some skeletal asymmetries in the mandible. Our research supports some of their findings and contributes new findings for skeletal asymmetries. Our study was completed before their article was published, so it was exciting to find that both of our methodologies found some statistically significant skeletal asymmetries that were not detected or