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## **Commentary: Too much ado about P-value**

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**The authors have no conflicts of interest.**

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**Central message:** P-values do not provide clinically meaningful interpretation.

**Central picture:** P-values are far from being the source of thorough information that we believe.

For decades, research results have been strictly dichotomized into statistically significant or not significant, whether the p-value was below 0.05 or not. This method has been commonly used as a remark of the soundness of the study and used often as a major criterion on which the decision to submit a paper was based.

An evolving discussion in the definition of new statistical strategies to fill the power vacuum created by the extensive critiques addressed to the p-value is being debated [1, 2]. Many efforts still need to be taken in order to establish a new tool or a new plethora of statistical strategies, each suitable for different research questions. Hitherto, only a few journals are imposing new restricting rules about reporting the p-value, such as the New England Journal of Medicine [3].

The expert opinion by Prof. Visintainer [4] represents a valuable guidance to move beyond the robustly rooted misconduct of using statistical significance as a benchmark of the presence of an effect or an association. P-values are far from being the source of thorough information that we believe. For example, they do not relate to the extent of the clinical effect or do not tell the confidence we can have about the results. Confidence intervals can help interpreting results from a clinical perspective and providing more information regarding the precision of the estimate. Opposite to p-values which cannot be compared, confidence intervals can instead be compared regardless their statistical significance, and this can provide information on the consistency of treatment effect across studies thus supporting or disproving the original hypothesis.

However, confidence intervals may be mistakenly used just as the p-value if they are intended as an instrument to dichotomize conclusions and therefore used as proxy of p-value. Moreover, confidence intervals rely on the same statistical assumptions as p-value does, and therefore can provide distorted results in case of violation.

In conclusion, misconception continues to exist on whether the relevance of statistical association should only be interpreted on the basis of p-value. Cardiovascular research needs to rely upon robust and common rules of interpretability. Prof. Visintainer provided in his expert paper a guidance that should be taken into account by researchers aiming to successfully submit their research to JTCVS.

## References

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