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EDITORIAL

Data, the future of Science and Clinical Practice

Datos, el futuro de la ciencia y la práctica clínica

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The statement posed in the title of this editorial that seems so obvious, is not that obvious for several reasons. First, data presents in very different shapes and sizes, and in many cases it is the size that matters when it comes to claim conclusions, the advance of scientific and clinical knowledge and reach the society by improving people quality of life. However, most of clinical evidences use to be derived from rather small or short-term trials, eventually summed up in systematic reviews and more recently in meta-analysis to arrive to more solid and robust conclusions. Second, the explosion of research efforts and publications in those fields has frequently increased the controversy of the results reported, what in some instances confound the scientific community. Particularly vulnerable in this regard are clinicians who have to decide which diagnostic tools and treatment options to trust and apply to their patients. If there might be a statistical/probabilistic justification to this increased discrepancy of results, there is also a growing evidence that data generated sometimes can be of doubtful confidence either regarding the way it were obtained, analyzed or whether they exist at all!!. This has led to a crisis in reproducibility and trust in science that has been the object of many recent editorials, internet publications and other academic publications.

As Associate Editor and Editor-in-Chief of Journal of Optometry, I had the sad chance to see some of these behaviors in manuscripts submitted to the journal. It seems that one logical answer to those temptations is to request from authors the raw data supporting the published results. Some platforms already request for that but these could only apply to published data, usually linked to the published papers, influenced by publication bias and in some cases, potentially subjected to availability constrains depending on the long-term viability of the publication project. Therefore, other wider perspective approaches are being followed at several institutions through Data Repositories. These institutional repositories platforms potentially more durable in the future might provide researchers a good platform to publish their Datasets, making them F.A.I.R, what means Findable, Accessible, Interoperable and Reusable.[1]

Independently of the reasons that drive us to share raw data and datasets, this can ultimately ensure that all of us have access to more and more data, be able to trust the origin of such datasets and eventually used them with due permission to conduct deeper analyses and derive more solid conclusions.

We are at a point where measuring ocular and visual parameters can be done with significant reliability and accuracy, and quite fast. This takes us to the production of massive amount of data, sometimes well beyond our capability to properly analyze them. In other instances, data obtained, in isolation are not powerful enough to derive solid conclusions but might be helpful to feed collaborative efforts.

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Trustfully sharing Datasets in Vision Science requires a rigorous Metadata specification. Not only the instrumentation, calibration and other technical specifications are relevant. In many instances the use of diagnostic drugs, artificial conditions, luminance and illuminance conditions, visual tasks involved, and many other inclusion and exclusions criteria are critical for others to judge the potential use and meaning of such datasets and the level of compatibility between datasets.

Again, sharing datasets does not come without risks of missuses. Therefore, tools to assist with Dataset verification for consistency, Metadata comprehensive specifications, plagiarism detection, Dataset citation and cross-reference must evolve in parallel with the widespread and evolution in the coming Data sharing age.

In conclusion, fair Data sharing must allow us to take solid steps towards robust conclusions from fairly stablished collaborative efforts around the World and bringing back to Science a trustful environment that ultimately serves the society in the best way.

Reference

1. Wilkinson MD, Dumontier M, Aalbersberg IJ, et al. The FAIR Guiding Principles for scientific data management and stewardship. *Sci Data. 2016;*. 2016;3:160018, doi: 10.1038/sdata.2016.18. Erratum in: Sci Data. 2019 6 (1):6.