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COMMENTARY

INTRODUCING THE 'EMJ SERIES ON STATISTICS AND METHODS'

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Research articles in the *Ethiopian Medical Journal (EMJ)* are selected for publication based on their scientific merit and relevance of the findings primariliy to clinicans in Ethiopia. To keep abreast with the ever expanding body of knowledge, clinicians must read, appriase and understand publishedinformation. This assumes that clinicians must also have the understanding of the reserach methods, including statistical analyses employed in clinical research. Unfortunately, clinicians are oftentime not familiar with research methods owing to the relatively inadequate attention given to research methods and statistics in medical schools. Because of this and lack of oprtunities to learn enough about reserach methods early on in their service years most clinicians are not well-prepared to make critical appraisal of published evidence, develop well designed protocols, and appropriately analyze and responsibly interpret epidemiological studies (1)

Some 20 years back, Altman DG, a reputed statistician at Oxford, U.K, asked in the *British Medical Journal* (*BMJ)*, "What should we think about researchers who use the wrong techniques (either willfully or in ignorance), use the right techniques wrongly, misinterpret their results, report their results selectively, cite the literature selectively, and draw unjustified conclusions? We should be appalled. Yet numerous studies of the medical literature, in both general and specialist journals have shown that all of the above phenomena are common" (2). This unequivocally reflects what we at the *EMJ* have been experiencing and are often haunted by as editors of the Journal. Indeed, we quite often get dismayed by manuscripts that describe poorly conducted, analyzed and reported studies and by the inappropriate application of statistical methods and the inferences made thereof.

The number of submissions to *EMJ* involving rigorous analysis of data-viz. observational studies, clinical trials, meta-analyses-has increased, particularly since the early 1990s. Multivariable methods viz. multiple linear, logistic and Cox regression frequently appear now in papers submitted to the Journal. Statistical analysis and interpretation of results in many of them required substantial fine-tuning through the peer-review process of the Journal. Balancing statistical rigor with readers' comprehension has been a challenge to authors. Having recognized these, guidelines for authors on how to present statistical information (3) were developed based on international recommendations (4) and published in each Issue of the Journal.

EMJ statistical reviewers and editors checkto levels possible the validity of the statistical methods used, and whether they are adequately explained and whether the conclusions are reasonable.However, much more is still required from the authors in using the most appropriate statistical methods, which if possible are also not over-complex and interpreting the results clearly.Recognizing the need to help clinicians and other readers better understand how to use and interpret scientific articles, *EMJ* haslaunched in this Issue of the Journal '*Series on Statisitics and Methods*'. The Series will be written in the language practicing clinicians can understand. This will help clinicians better understand the medical literature and apply it in the wite-up of manuscripts for publication in the EMJ or other peeer-reviewed journals. It complements exisiting guidelines by providing a more granular and specific discussion about statistics and research methodology used in an individual article. The articles in the Series will be written in plain English, avoid complex mathematics, and present materials graphically and summary tables and boxes whenever possible.

EMJ will employ experiences of a number of journals which have published guidelines for carrying out commonly used statistical methods, including the *JAMA* and *BMJ* which have published numerous excellent series of short articles on a wide range of statistical topics (5,6). The new Series of articles in EMJ, driven by the needs on the ground and drawing much inspiration from successful expereincesof other journals, *JAMA* and *EMJ* in particualr, will provide explanations about statistical analytic approaches and methods used in research reported in *EMJ* articles. These explanations will use examples from articles published in the *EMJ*that employ the statistical test or methodological approach, thereby providing an example of the topic being discussed.

The *EMJ Series on Statistics and Methods* defines statistics as mathematical approaches to analyzing and describing collections of data whereas by methods it refers to how a study was designed or some other general approach to how a study was organized and conducted. Articels in the Series will explain why a particular test or method was used, what its limitations are, discuss risks of bias, and examine why the reasons underlying the selection of a specific statistical test for

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analysing and summaizing a data set. These articles will explain how the findings from statistical tests should be interpreted in the accompanying *EMJ* research article. Articles in the Series will also discuss the limitations of interpreting the data given the methodology used to examine it.

The first two articles in the *EMJ Series on Statistics and Methods* appearing in the July 2018 Issue of the Journaldiscuss'variables, populations, and samples' and 'normal distribution and the central limit theorem'as they relate to research articles. In addition to providing a general description of principles related to the two selected topics,examples are given to explain how the principlesare applied in journal articles. The use of expamles, where possible with a specific article, we hope will enhamce the learning experience.

Because medical information is vast and rapidly expanding, physicians must pursue life-long learning. This requires reading and understanding research articles published in medical journals. Research articles cannot be assessed if the statistical analysis and research methodology used are not understood by the readers. Along with the othercomprehsive general guidelines and reserach method specific guidelines (4,7), the new *EMJ Series on Statistics and Methods* will help readers better understand clinical research reports. With increasing awareness, the use of statistics in medical resrach will continue to improve. A s a reuslt, clinicians will not only be able to anlyze and report research results, but also guard against ethical pitfalls (8).

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