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Role of meta-research in the medico-scientific field

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Meta-research is a recent field of research that studies research practices with the aim of finding evidence-based improvements. It is "Research on research" or "The science of science" "Taking a bird's eye view of science" and it fights with bad science. The concept is that science is the best thing that has happened to human beings, but we can do it better. Meta-research has grown as a reaction to the replication crisis and concerns about waste in research. The estimates for irreproducibility based on these empirical observations range from 75% to 90%. These estimates fit well with estimates of 85% for the proportion of biomedical research that is wasted at-large. This irreproducibility is not unique to preclinical studies. Similar concerns for observational research and it has been reported that "None" of the 52 predictions from observational studies were confirmed in randomized clinical trials. Therefore, many journals have discussed on the reproducibility and waste of research.

Some of the examples on meta-research include (1) most meta-analysis has been redundant, misleading, and conflicted, (2) failure of clinical trials, which entered with selected animal research with positive outcome or (3) reproducibility crisis among animal experiments which can result in research waste. As one example, this influenced scientists, National Institutes of Health (NIH), journal editors, stakeholders, et al. and the NIH proposed a set of reporting guidelines and funding policies to improve the reproducibility and rigor of preclinical research. Consequently, a core set of standards first proposed by the NIH's National Institute of Neurological Disorders and Stroke were adopted. Standards and NIH identified randomization, blinding, sample size estimation, and data handling as minimum reporting requirements to promote transparency in animal studies. In addition, the NIH announced that it would require that sex be considered as a biological variable in applications for preclinical research funding. Further, animal research guidelines have been introduced and now adopted by many journals.

In this session, I will share the importance of meta-research which is an important research field to fight with bad science and go to the right way.