Guest-of-Honor's Address during *the Fourteenth International Conference on Statistical Sciences*, Islamic Countries Society of Statistical Sciences and Jinnah Sindh Medical University, Karachi, Pakistan, Inaugural Session, Najmuddin Auditorium, March 14-16, 2016

Statistics is Present, Mathematics is Future

*Syed Arif Kamal**
Gold Medalist; PhD (Neuroscience); MA, Johns Hopkins, United States; MS, Indiana, Bloomington, United States

Convener, National Curriculum Revision Committee (Mathematics), Higher Education Commission (HEC), Government of Pakistan (2004-2012); Convener, Subject Committee (Mathematics), National Testing Service (2009-2012); Member, Expert Panel (Mathematics), National Curriculum Council, Ministry of Education, Government of Pakistan (2005-2010)

Professor of Mathematics and Dean, Faculties of Science and Engineering
University of Karachi, Karachi, Pakistan; profdrakamal@gmail.com

These days, the Islamic countries, who were leaders in scientific research during the last millennium, seriously lack in the mainstream scientific research. This conference is one of the series of initiatives to find out reasons of this decline. Here, professionals from different countries have gathered to highlight role of statistics in propagating research in the biological, the physical and the social sciences to have proactive role in empowering research, teaching and community development[π]. *Statistics* is considered as the science or the practice of collecting, organizing, classifying and analyzing big data, consisting of numbers, for the purpose of inferring proportions in a whole from those in a representative sample. Hence, statistics sheds light on the current state of the data by providing measures of central tendency (arithmetic mean, median, mode) and measures of dispersion (mean deviation, standard deviation). *Mathematics*, on the other hand, (from Greek**:** μάθημα, máthēma, meaning knowledge, study, learning) consists of the exploration of quantity (number theory), structure (algebra), space (geometry*)* as well as change (analysis). Through mathematical modeling and analysis, this branch may help understand and shape future of the nation through better planning and implementation of various policies. *Numeracy* is, therefore, as significant in nation-building as *literacy*. The talk then shifted towards mentioning the main reasons of failure to publish in quality research journals, which are recognized by the scientific and the academic communities[§]. These include lack of training in the strategy of experimenting[¶], incorrect decisions based on insufficient data, bad engineering decisions by setting vague objectives for projects[ψ], inappropriate statistics courses taught in the colleges and the universities. The schedules or the surveys conducted are deficient in the sense that they do not check consistency through principal-component analysis of the questions asked from the participants, who are, sometimes, not selected based on statistical rules. The questions should have a mixture of positive and negative statements and the distribution of responses for these positive and negative questions, based on 5-point-Likert scale, must be mirror of each other. The positive and the negative questions should not be clustered together but randomly distributed throughout the survey. It is, also, important to calculate the sample size prior to start of a survey based on the level of confidence selected and identify all variables of interest. In addition, interactions of different variables should be studied. While reporting a scientific study, ORCID number https**:**//orcid.org of the first/the corresponding author and, wherever available of all authors should be given. One must meticulously document selection of the sample (including computation of sample size), descriptive statistics (qualitative and quantitative), experimental set-up, experimental conditions, strengths and limitations of the study as well key points (or key notes), last one in bulleted form. Running title should be derived from (have almost the same words) the main title. Keywords[ɔ] should not include the words appearing in the title. It is recommended to list units and their conversion factors[ɔ] as well as abbreviations and symbols[ɔ] used throughout the paper. The references listed at the end a scientific paper should appear in the text. Further, only references relevant to the title must be cited with an approximate distribution — 50% or more for work done during the last 5 *years*; 50% or less of author's own research group (references to conference presentations, dissertations, essays and theses and should be avoided, as much as possible). The *Quality Enhancement Cells* (QEC) established in various institutions of higher learning have the responsibility to organize training programs for their faculty and graduate students, so that they may be able to conduct quality research and publish in recognized journals as well as present in established international conferences, *e. g.*, conferences sponsored by IEEE.

*Keywords***:** Data processing • Experiment design • Making of surveys • Modeling and forecasting • Thomson-Reuters-indexed journals

*Web address of this document***:** https**:**//www.ngds-ku.org/Presentations/Statistics.pdf

---

*Senior-most professor among the entire faculty of University of Karachi

[π] https**:**//www.ngds-ku.org/Presentations/Research-Teaching-ComDev.pdf

[§]In Pakistan, HEC encourages the authors to publish in journals having 'W', 'X' and 'Y' categories ('W' and 'X' in science subjects), which are accepted for the purposes of faculty promotion in the Pakistani universities and award of PhD degrees from the Pakistani institutions of higher learning. Papers published in such journals are listed in Web-of-Science Master Journal List and other such indexing agencies. These are considered for appointment on tenure-track and tenured positions. Note that the only ISI impact factor recognized by HEC is given by the Institute of Scientific Information (Philadelphia, Pennsylvania, United States) https**:**//clarivate.com/webofsciencegroup/essays/impact-factor/ founded in 1956 by Eugene Garfield and known the Clarivate Analytics since 2015. Any other website using the abbreviations ISI or any other type of impact factor is not accepted by HEC. The impact factor measures the frequency with which a typical article in a journal was cited in a given year. It is used to quantify the rank or significance of a journal by determining the number of times its articles are cited. The calculation is performed for citations within a two-year period. For determining the impact factor, one needs to divide the number of times articles are cited by the number of articles that are citable. Hence, the 2016 impact factor is given by *n*/*N*, where '*N*' is the total number of *citable items* published in 2014 and 2015 and '*n*' is the number of times articles published in 2014 and 2015 were cited by indexed journals during 2016.

[¶]Those involved in experimental work must realize that there are *good* experiments and there are *bad* experiments. Many are either *poor* experiments https**:**/www.ngds-ku.org/Presentations/Physics2.pdf which can result in wrong decisions, or *inefficient* experiments, which end up in excessive cost or time delay in reaching a decision. The great scientific experiments https**:**/www.ngds-ku.org/Articles/A19.pdf served to elaborate the formal aspects of method (decide between rival hypotheses, find the form of a law inductively, explore the characteristics of a naturally occurring process, use models to simulate processes, exploit an accident, interpret null results), develop the content of a theory (find hidden mechanism of a known effect, provide existence evidence, decompose a simple phenomenon), establish techniques (accuracy and care in manipulation, power and versatility of apparatus).

[ψ]https**:**//www.ngds-ku.org/Articles/A20.pdf

[ɔ]To be listed alphabetically