



## Statistical analysis and ophthalmology

**Anil Kumar**

Dept. of Statistics,

Faculty of Science & Technology,

Mahatma Gandhi Kashi Vidyapith, Varanasi

Email: dranilkrmgkvp@rediffmail.com, kk\_anil@rediffmail.com

### Access this article online

<b>Quick Response Code:</b>	<b>Website:</b> www.innovativepublication.com
	<b>DOI:</b> 10.5958/2395-1451.2016.00020.2

Studies on ophthalmology are distinguished in obvious, yet important information come from many other line of research. Ophthalmology generally provides two data a point which comes from eyes. Researchers properly utilize the information from both eyes. However, measurements from the two eyes of a single subject are often correlated. Measurements resemble each other more than they do measurements from the eyes of other subjects. Such type of inter-eye correlation must be accounted in the analysis which cannot be ignored. Thus, the researchers are naturally led to employ specialized statistical techniques for correct analysis.

The main consequence of ignoring the two-eye nature of a design are quite serious which are overstatement of the precision of statistical estimates. This manifests itself in reported measure of variations and standard errors which are too small, confidence intervals which are too sharp and P-values which are incorrectly small. These measures indicate a greater measure of statistical significance than the data warrants.

Until recently in most of the studies, epidemiologic and statistical principles were routinely ignored in ophthalmic research. Fortunately this is no longer the case, since their use results in better designed, more efficient and meaningful studies-usually with little additional work. It is essential that every clinical researcher be familiar with the concepts involved, where outside epidemiologic and statistical assistance is

available, he must be able to recognize what help to seek and questions to ask and where not available, he must be able to carry out the necessary procedures on his own. It is equally essential for every informed clinician who wishes to be better equipped to evaluate the significance and value of published and sometimes conflicting-reports.

This is a practical primer for busy clinicians who have neither the time nor inclination to pursue formal courses in ophthalmology and statistical analysis. For simplicity and brevity we confine to principles and techniques required for conducting and interpreting the most common types of clinical studies, descriptive reports seeking new etiologic agents, evaluation of diagnostic and screening procedures and therapeutic trials.

### References

1. Kahn HA: Letter. Invest Ophthalmol 13:634,1974.
2. Rosner B: Statistical methods in ophthalmology: an adjustment for the intraclass correlation between eyes. Biometrics 38:105, 1982.
3. Kirk RE: Experimental Design: Procedures for the Behavioral Sciences. Belmont, California, Brooks and Cole, 1968, p. 423.
4. Steel RGD and Torrie JH: Principles and Procedures of Statistics, 2nd ed. New York, McGraw-Hill, 1980, p. 9.
5. Steel RGD and Torrie JH: Principles and Procedures of Statistics, 2nd ed. New York, McGraw-Hill, 1980, pp. 153-166.
6. Snedecor GW and Cochran WG: Statistical Methods, 7th ed. Ames, Iowa, Iowa State University Press, 1980, pp. 242-250.
7. Ray WA, O'Day DM, Head WS, and Robinson R: Statistical analysis for experimental models of ocular disease: continuous response measures. Curr Eye Res 4:585,1985.