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FROM THE INSTITUTE

Exciting news from the Research Institute! Below is the home page of our new web page. You can find it at www.kcom.edu. This web page provides a vast amount of information for our research community. From ways for you to support our research to educational and training opportunities, you’ll find it here. I look forward to hearing your thoughts on this special place on the web for the Research Institute.

JANE’S CORNER

This month’s topic: **Chi-square tests**

There are many statistical tests which are based on a “chi-square statistic” but these are not all “chi-square tests”. In general, when speaking of a chi-square test, the author is generally referring to one of two statistical tests: a chi-square test of independence or a chi-square test of homogeneity.

A chi-square test of independence is designed to test the hypothesis that two categorical variables are associated versus that they are independent or not related to each other. (A categorical variable is a characteristic measured on subjects which has values which are categories (for example, gender has values of male and female) and not numerical.) A significant p-value indicates that there is evidence that the two variables are related to each other in some manner.

A chi-square test of homogeneity is designed to test the hypothesis that two or more groups differ on the percent which have a particular characteristic. The groups can either be sampled separately (for example, studying a group of subjects who have a particular disease and a group of subjects who do not have the disease) or subjects can be randomly assigned to groups (for example, treatment and control groups). A significant p-value indicates that there is evidence that the two groups differ on a particular characteristic.

The interesting news is that the mathematics for both these chi-square tests is exactly the same. So, it is up to the author to correctly interpret the results of the test, indicating whether the test was one of independence or of homogeneity.

If you have any statistical questions you would like addressed in future issues, please contact Jane Johnson (jjohnson@kcom.edu).
NIH HIGHLIGHTS ON RESEARCH

BALANCE THE TECHNICAL AND NON-TECHNICAL

When writing a PHS 398 proposal you’ll need to balance technical and nontechnical writing, especially in your specific aims. Why? First, most reviewers will just scan your application, and second, they may not be familiar with your field or methods.

One way to organize the technical and nontechnical information is to keep the parts of the application most reviewers will likely read — abstract, significance, and specific aims — simple and nontechnical, and get technical and detailed only in the methods section. Your methods section will need to spell all your experiments out in fine detail. Another approach is to include both technical and nontechnical information throughout the application. For example, you could begin each paragraph simply and then progress to more complex information, or you could alternate paragraphs that have less and more technical information. To be safe, be sure to include both broader, less technical descriptions as well as more technical information in the most widely read sections of your application.

Be very careful with your highly technical material. Some of the reviewers may be better informed about your field than you. Leave out anything that is not critical. The more you put in, the more information there is for reviewers to find fault or disagree with.

JOURNAL FOCUS

Best Practice & Research Series:
- Clinical Anaesthesiology
- Clinical Endocrinology and Metabolism
- Clinical Gastroenterology
- Clinical Haematology
- Clinical Obstetrics and Gynaecology
- Clinical Rheumatology

This journal series provides a comprehensive review of current clinical practice and thinking within each specialty. All chapters are commissioned and written by an international team of practicing clinicians with guest editors drawn from a pool of renowned experts and opinion leaders. Reference is made to the latest original research, Cochrane reviews, audits and confidential enquiries, national and international conferences, national and international guidelines, and personal communications.

All chapters take the form of practical, evidence-based reviews that seek to address key clinical issues of diagnosis, treatment and patient management. Each issue follows a problem-orientated approach that focuses on the key questions to be addressed, clearly defining what is known and not known. Management will be described in practical terms so that it can be applied to the individual patient. The series’ objective is to provide a continuous update for the busy clinician and researcher.

RESEARCH CORNERSTONES

THE YIN AND YANG OF RESEARCH

External Validity

External validity is the degree to which the conclusions in your study would hold for other persons in other places and at other times (generalization).

A threat to external validity is an explanation of how you might be wrong in making a generalization. There are three major threats to external validity — people, places or times. Critics could argue that it might only work due to the unusual type of people in the study. Or, they could argue that it works only because of the unusual place or time you did the study.

How can we improve external validity? Use random selection and keep your dropout rates low. Perhaps the best approach to criticisms of generalizations is simply to show them that they’re wrong. Do your study in a variety of places, with different people at different times. Your external validity will be stronger the more you replicate your study.

RESEARCH REFLECTIONS

Interpreting and Reporting Public Health and Medical Research: Techniques and 13 Key Questions
(Critical Appraisal of Scientific Articles)

Question 1—What was studied, and why?

There are two problems that should be addressed:

PROBLEM 1: The need or rationale for the study is missing or unclear.

- The authors assumed, incorrectly, that readers will know why the study was done.
- LIKA Syndrome (“Little Is Known About . . .” does not justify a study)

PROBLEM 2: The purpose or goals of the study are missing or unclear. The authors have assumed, incorrectly, that readers will know the specific purpose or goals of the study

TECHNIQUE: Rephrase the rationale and the purpose in your own words.


NIH DICTIONARY

DUAL PEER REVIEW — Peer review process used by NIH. The first level of review provides a judgment of scientific merit. Generally conducted by an Institutes or Centers’ advisory council, the second level of review assesses the quality of the first review, sets program priorities, and makes funding recommendations (http://grants2.nih.gov/grants/funding/ac.pdf).

HISTORY LESSONS

“The Tuskegee Syphilis Study”

The “Tuskegee Study of Untreated Syphilis in the Negro Male”, carried out in Macon County, Alabama, from 1932 to 1972, is an example of medical research gone wrong. The United States Public Health Service, in trying to learn more about syphilis and justify treatment programs for blacks, withheld adequate treatment from a group of poor black men who had the disease. The study involved 600 black men — 399 with syphilis and 201 who were disease free. The men were told they were being treated for “bad blood” and did not receive the proper treatment needed to cure their illness.

In July 1972, a New York Times story about the Tuskegee Study caused a public outcry that led the Assistant Secretary for Health and Scientific Affairs to appoint an Ad Hoc Advisory Panel to review the study. The panel found that the men had agreed freely to be examined and treated. However, there was no evidence that researchers had informed them of the study or its real purpose. In fact, the men had been misled and had not been given all the facts required to provide informed consent. The men were never given adequate treatment for their disease, even when penicillin became the drug of choice for syphilis in 1947.

The advisory panel concluded that the Tuskegee Study was “ethically unjustified” — the knowledge gained was sparse when compared to the risks the study posed for its subjects. In October 1972, the panel advised stopping the study at once. In the summer of 1973, a class-action lawsuit filed by the NAACP ended in a settlement that gave more than $9 million to the study participants (University of Virginia, 2002; http://www.med.virginia.edu).
SPECIAL FOCUS

Stephen H. Hochschuler, M.D.
A.T. Still Research Institute External Board of Scientific Counselors (EBSC)

Dr. Hochschuler is the Co-founder, Chair, and Fellowship Co-director of the Texas Back Institute. The Texas Back Institute is the largest, freestanding spine specialty clinic in the United States. Dr. Hochschuler, a graduate of Harvard Medical School, is a board certified orthopedic surgeon/spine surgeon and an internationally recognized spine expert. He developed the first back school and has authored numerous research papers in international spine journals and conducted presentations nationwide.

PICTURE OF THE MONTH

Hospital Corps Detachment at Camp Columbia, Havana, September 1900. Most of the volunteers for yellow fever experiments came from this Spanish American War unit (http://www.med.virginia.edu/hs-library/historical/yelfev/pan10.html).

TIDBITS

- Healthy People 2010 is a comprehensive, nationwide health promotion and disease prevention agenda. It is designed to serve as a roadmap for improving the health of all people in the United States during the first decade of the 21st century. The 28 focus areas of Healthy People 2010 include the following: Access to Quality Health Services, Arthritis, Osteoporosis, and Chronic Back Conditions, Cancer, Chronic Kidney Disease, Diabetes, Disability and Secondary Conditions, Educational and Community-Based Programs, Environmental Health, Family Planning, Food Safety, Health Communication, Heart Disease and Stroke, HIV, Immunization and Infectious Diseases, Injury and Violence Prevention, Maternal, Infant, and Child Health, Medical Product Safety, Mental Health and Mental Disorders, Nutrition and Overweight, Occupational Safety and Health, Oral Health, Physical Activity and Fitness, Public Health Infrastructure, Respiratory Diseases, Sexually Transmitted Diseases, Substance Abuse, Tobacco Use, Vision and Hearing (http://www.health.gov/healthypeople).

- The Missouri Rural Health Association is a non-profit, grassroots, member-driven organization whose mission is to safeguard and improve the health of rural Missourians. The Association will strive to accomplish this by engaging in partnerships and providing leadership on rural issues through advocacy, communication, education and research. Membership dues range from $25.00 to $150.00 annually. To contact the association go to http://www.morha.org or phone (573) 636-5554.


- The fourth Osteopathic Collaborative Clinical Trials Initiative Conference (OCTIC IV) will be held March 23-24, 2003 at the Westin Hotel in Ottawa, Canada. The meeting will be held in conjunction with the American Academy of Osteopathy Convocation. The Osteopathic Collaborative Clinical Trials Initiative was developed to help foster a culture of conducting clinical research in the osteopathic profession, particularly in the area of osteopathic manipulative medicine. If you would like to receive more information about the OCTIC IV, visit the American Association of Colleges of Osteopathic Medicine’s web site at http://www.aacom.org. Click on “Announcements and Events: to register online. You may also obtain more information about the conference by contacting Cathleen Kearns at ckearns@aacom.org.