

Public Health Practice



Stories from the Field

The University of Texas School of Public Health
Student Practicum Experiences
Summer 2013 – Biostatistics

The practicum experience is an integral part of the MPH and DrPH curricula. Public health students are provided with the opportunity to apply their classroom knowledge to real world settings through which they make a meaningful contribution to a public health organization.

Under the guidance of a community preceptor and faculty sponsor, students from all divisions gain a deeper understanding of public health practice, interact with professionals in the field, and expand their repertoire of professional skills.

This eleventh-edition e-magazine showcases student practicum experiences throughout the Summer 2013 semester. (Prior semesters may be accessed through the e-book, a collection of student abstracts and e-magazines describing their experiences.)

Practicum Topics

Serving Size: 1 Practicum per Student

Servings per e-Magazine: 5

Hours per Week per Student	Approximately 12
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Campuses (Houston)	1
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Division	1
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Student

Biostatistics

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Being a Data Expert	Ming Yang
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Unmet need – Systemic Lupus Erythematosus



Biogen IDEC – Parent organization of my practicum site.

Special duties during practicum

- Exposure to cross functional activities in early drug development.
- Exposure to integration of clinical and genomic data.
- Attended FOCIS meeting for training in immunology.
- Interaction with various stakeholders in academia industry partnership.

Advice for Future Students

- Seek the type of work you love.
- Plan your practicum site keeping in mind your future work place.
- Don't hesitate to ask questions to yourself and to others.

Insights into New Drug Development

By: Dhiraj Gambhire

I am doing my practicum at Biogen IDEC global research facility at Cambridge, Massachusetts in immunology department. Biogen is committed to develop new therapies for various immunological diseases. I am involved in the project for developing new therapies for Systemic Lupus Erythematosus (SLE). I am involved in analyzing a cohort study in SLE to understand effect of various clinical characteristics and

background therapy on interferon signature. I observed that use of plaquenil is associated with lower interferon signature value. This association is affected by severity of disease, family history and antibody dsDNA antibody levels. I used various descriptive statistics methods and significance tests to present my results. I prepared report of these finding and presented results to various internal sub-teams (Data not provided here as per publication policy of Biogen)

Public Health Significance

My practicum relates to the 10th public health essential service, Research for new insights and innovative solutions to health problems. Biogen IDEC is committed to discover and develop innovative solutions to various health problems like Multiple sclerosis and autoimmune diseases.

Systemic lupus erythematosus (SLE) is an autoimmune disease affecting multiple organs, with onset usually in young women in the third to fourth decade of life. According to lupus foundation of America 1.5 million Americans, and at

least five million people worldwide, have a form of lupus. There are numerous unmet medical needs in SLE, including management and treatment of severe disease. Only one new drug has been approved for the treatment of SLE in last 50 years. The Lack of effective treatments brings forward significant challenge in terms of mortality, morbidity and economic impact. The development of new therapies could substantially reduce the disease burden of SLE impacting public health.



http://chrisallenmd.com/drug_development

Drug discovery development is a multidisciplinary process.

Statistical Analyses of Clinical Trials: Smoking Cigarettes during Pregnancy

Various Methods of Statistical Analyses used in Clinical Trials

By: Swetha Mulpur

For my practicum, I worked with Dr. Charles Green on the statistical analyses for several clinical trials. These trials were conducted under the Principle Investigator Dr. Angela Stotts at UT Medical School in Houston. The trials I worked on involved interventions to reduce cigarette smoking during pregnancy. One trial tested the efficacy of using Motivational Interviewing (MI) as an intervention approach and the other tested the use of the medication Bupropion and MI as potential interventions.

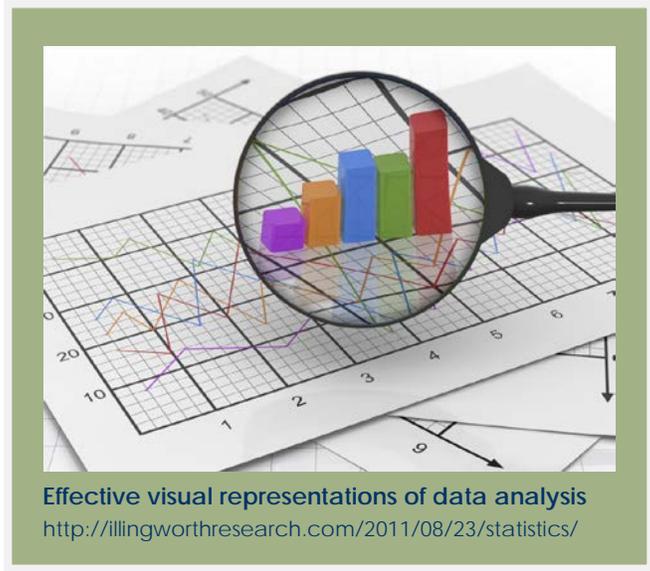
For one of the ongoing studies, I was asked to create numerous

graphs with basic demographic data using SAS and Excel software. I later compiled these graphs and presented them to the study PI as well as others who were involved with the study.

I also was worked on outcome graphs for a completed trial that tracked the cotinine levels for each of the participants. Using SAS, I was able to create line graphs, separated by the different randomization groups. These graphs were later used by the study PI as a preliminary visual representation of the efficacy of the clinical trial.

Highlights during your practicum

- I learned about the use and application of several new statistical models like dynamic modeling and latent class modeling.
- I was able to assist with the poster on latent class modeling which was presented at the 2013 CPDD Conference



Advice for Future Practicum Students

- Make sure you are well versed in all aspects of the projects you work on i.e. the protocols, previous published research and any potential confounders
- The majority of the work done in this practicum was done independently so proper time management and communication was extremely important
- Take initiative to go above and beyond what is required from you. This not only builds your confidence, but could lead to more opportunities and recognition

Public Health Significance

Biostatistics is a vital aspect of public health research. This experience has showed me the importance and intricacy of the field as well as the specific part it plays in research.

The Public Health Essential Service (PHES) that is most related to this practicum is: to evaluate effectiveness, accessibility, and quality of personal and population-based health services.

The analyses conducted and reported from these trials have encompassed this PHES and will eventually be used to reinforce whether these specific interventions should be used to address this dangerous public health issue.

Biostatistics is just one facet of public health research. However, it plays an essential role in not only quantifying the problem but also determining if an intervention is effective.



Sample Size Estimation



http://www.skstatservices.com/images/sample_size_estimation.jpg

Duties during practicum

Develop methodology and a program in 'R' to estimate sample size for recurrent time-event data using Anderson & Gill model and Poisson regression model for a Phase 2 clinical trial

Perform simulations in R and SAS to test statistical models

Advice for Future Students

Applying your skills is the best way to master them. Every student should look for such opportunities during his/her curriculum. You get a chance to work with successful professionals in your field who can guide you towards your ultimate goals.

Sample size and power estimation of recurrent time-event data

By: Navdeep Pal

During the summer, I worked at Array BioPharma Inc. as an intern in the Biostatistics division. Array is focused on the discovery, development and commercialization of targeted small molecule drugs to treat patients afflicted with cancer.

A clinical trial must have sufficient power to support its primary objective. On the other hand, considering the resources spent per patient, there is no room for overly powered study designs in the clinical trial world. Sometimes clinical trials have recurrent events, such as bleeding events, as primary or

secondary endpoints. For these recurrent events, the data needs a different strategy for analysis, sample size and power estimation.

I was responsible for developing a methodology and related program in 'R' statistical software to estimate the sample size needed to maintain optimum power during analyzing time to event data with recurrent events. The sample size methodology which I developed during this internship will be used while planning statistical analysis for a clinical trial at Array.

Public Health Significance

It is estimated that 1,660,290 men and women (854,790 men and 805,500 women) will be diagnosed with cancer in 2013. Of these, 580,350 will die from the condition. Developing new therapies and testing their safety & effectiveness by clinical trials seems like the only way out. Many treatments used against cancer today are the results of past clinical trials.

innovative solutions to health problems is the most essential public health service a public health practitioner/ organization can provide. Array BioPharma is focused on developing highly specific targeted small molecules to treat cancer. The goal is to address the critical unmet medical needs in the fight against cancer.

Research into new insights and



<http://www.jyukawa.com/images/>



<http://www.writeawriting.com/wp-content/uploads/2011/10/research-design-definition-types-explained.jpg>

CNS Relapse in Leukemia Patients



A long-standing MD Anderson tradition has patients ring a gong at the end of their treatment. This simple, but exciting ceremony is repeated hundreds of times each year as a way for patients to announce their victory and encourage other patients to keep fighting. Many patients invite friends and family to celebrate this unforgettable moment in their fight against cancer. (<http://www.mdanderson.org>)

Special events/ duties during your practicum

- Analysis that correctly confirmed association results.
- Interactions with a physician who cares deeply about the well-being of her patients.

Advice for Future Students

- Analysis of patient data can seem tedious and impersonal, but I have learned to value the work behind the scenes that helps the entire healthcare system better care for the patient as a whole. Don't get discouraged when you aren't seeing patients day-to-day. You are making a difference behind the scenes!

Base of Skull vs. Whole Brain Radiation

By: Ferial Shihadeh

In working with Dr. Bouhaina Dabaja in the Lymphoma division of the Radiation Oncology department at MD Anderson Cancer Center, I analyzed the association factors of leukemia patients with CNS relapse.

Leukemia patients are more likely to have a CNS relapse disease. We did analysis for those people to see which radiation fields are most effective in helping these patients live longer.

We found that the radiation field located at the base of skull has a worse prognosis than whole brain and craniospinal radiation.

Also, we looked at which risk factors associated with CNS relapse. With data analysis of patient's age, type of leukemia, intrathecal chemotherapy, transplant, we found there is association between CNS relapse and patients treated with intrathecal chemotherapy.

Public Health Significance

In order to best care for cancer patients, healthcare professionals must have appropriate research, analysis, and clinical trials to discover the most effective plans for treatment.

By doing analysis we can draw conclusions as to which treatments are having the best survivorship results. This analysis helps researchers and doctors develop new strategies for treatment. For this reason, data analysis is critical to improve long term survival in cancer patients.

In looking at the results of existing treatment and analyzing the similarities across patient populations, researchers are able to use data to create new forms of trials for more specific patient care.

At MD Anderson's Cancer Prevention Center, patients undergo screening to detect any early stage of cancer. Through this prevention strategy, not only are patients staying current on their tests, but they are also being educated on potential risk factors and symptoms that could lead to more serious cancers.

This ongoing cancer education impacts the communities in which these patients live.



Top: MD Anderson new logo. (<http://engineering.utsa.edu>)
Bottom: MD Anderson's newest building on site. (<http://www.whrarchitects.com/>)

For more information regarding
The University of Texas School of Public Health,
Office of Public Health Practice
and the practicum program, please visit:
<https://sph.uth.tmc.edu/practicum/>