Public Health Practice

Stories from the Field

The University of Texas School of Public Health
Student Practicum Experiences
Summer 2014 – 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 fourteenth-edition e-magazine showcases student practicum experiences throughout the Summer 2014 semester. (Prior semesters may be accessed through the e-book, a collection of student abstracts and e-magazines describing their experiences.)

Prevention diabetes safe kids clean water policy disaster response obesity

cancer adolescent sexual health HIV/AIDS research

alcohol empowerment vaccinations maternal & child health

UTHealth™ | **School of Public Health**

The University of Texas
Health Science Center at Houston

Practicum Topics

Serving Size: 1 Practicum per Student
Servings per e-Magazine: 4

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

	Student
Biostatistics	
Big Data in Cancer Care	Junhyun Choi
Categorical Data Analysis of Multifactorial Genomic Data	Rajeshwari Prasad
HIV Retention to Care	Yiling Wu
Houston Medical Monitoring Project	Bo Zhao

Big Data in Cancer Care

How Watson is Helping the Fight

Accelerating Research

IBM Watson will accelerate MD Anderson's research, so promising new therapies can be deployed more quickly in the fight against cancer, for the Center's 100,000 patients per year.

Enhancing Care

IBM Watson will help physicians build, observe and fine-tune treatment plans for patients, and address risks throughout the care continuum.

Integrating Research and Care

IBM Watson will help researchers and physicians understand the meaning behind each other's data, from sources such as clinical research notes, patient lab results, and a physician's observations.

Infographic: MD Anderson Taps IBM Watson for Moon Shots Mission to End CancerMD Anderson Taps IBM Watson for Moon Shots Mission to End Cancer From http://www-03.ibm.com/press/us/en/photo/42223.wss

Unlocking Big Data's potential to improve cancer care

By: Junhyun Choi

Using **Big Data** to Help Accelerate Translation of Cancer-Fighting Knowledge to Cutting Edge Medical Practices

APOLLO: Adaptive Patient-Oriented Longitudinal Learning & Optimization: a Platform to enable iterative and continued learning between clinical care and research by creating an environment that streamlines and standardizes the longitudinal collection, ingestion and integration of patient's medical and clinical history, laboratory data as well as research

Public Health Significance

Currently, the U.S. health care costs exceed 17 % of GDP and continue to rise. It is attributed to the aging population and rising cost of goods and services used for patient care such as workers, equipment and information system. This trend will be strengthened and avoidable. It compromise to enhance value in the delivery of health care. However, the huge technology improvements have been made and using big data and predictive analytic can be suggested as a solution to improve the quality of care and reduce the cost at the same time.

data into centralized patient data warehouse. Participate in Phase I APOLLO Initiative project at Leukemia Center to create Process Flow Chart

Approaches: Observation/Interview with Frontline medical teams at Leukemia Center. Discussion, Measured time for each activity in the process

Findings: Create/validate current state process in order to estimate time spent thus establishing a baseline for next phase II APOLLO initiative/Capture opportunities for improvement of cu

However, up to 80 percent of the healthcare industry's data remains unstructured because of its volume and diversity of data type, which can be neither easily searched nor accessed. APOLLO initiatives unlocking Big Data's potential is aligned with one of the essential public health service: "Research for new insights and innovative solutions to health problems", which intends to expand the project to include greater amounts of big data and analytical tools to Improve cancer treatment and to reduce burden on humanity around the world.
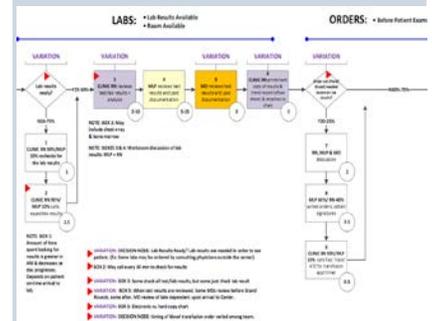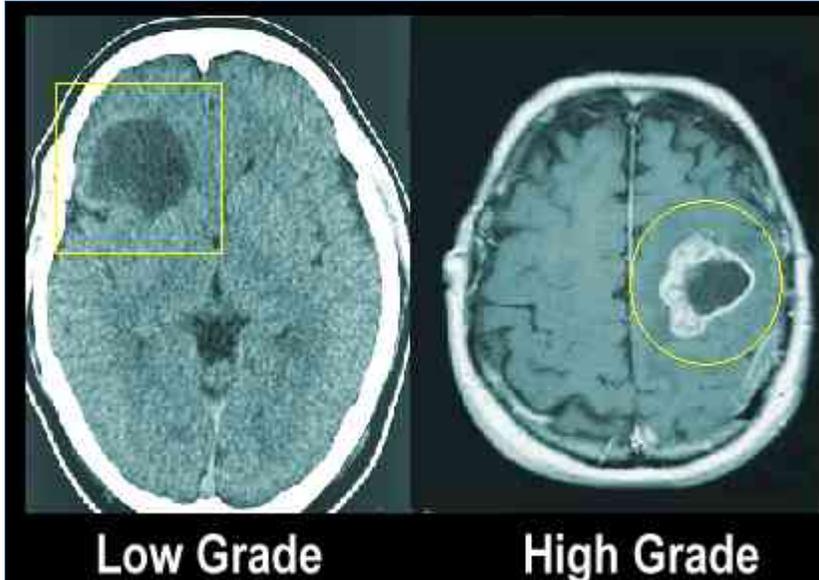
Part of Process Flow Charts at Leukemia Center created during phase I APOLLO Initiative project

THE UNIVERSITY OF TEXAS

MD Anderson Cancer Center

Making Cancer History®

Categorical Data Analysis of Multifactorial Genomic Data of Patients with a Lethal Brain Cancer

Source: http://www.aboutcancer.com/mri_gbm.htm

Gene expression analysis using multifactorial genomic data

By: Rajeshwari Prasad

For my practicum, I worked with Dr. Arvind Rao who is an Assistant professor at MD Anderson Cancer center's Department of Bioinformatics and Computational Biology. The focus of research in the Department of Bioinformatics and Computational Biology includes, but is not limited to microarray data analysis, biomarker identification, drug target discovery, functional genomics and proteomics. My practicum involved conducting gene expression analysis using imaging data of patients diagnosed with Glioblastoma, the most aggressive brain cancer. This practicum provided me the opportunity to apply the skills learnt in various statistical courses, here at the School of Public Health, in a real life setting using R as the statistical analysis software.

Public Health Significance

The Public Health Essential Service(s) (PHES) that most closely relates to my practicum experience is: Research for new insights and innovative solutions to health problems.

Glioblastoma multiforme is the most lethal brain cancer with dismal prognosis and poor survival rates. The genetics and pathogenesis of this dreaded cancer are still being elucidated. Knowledge of genetic pathways not only will enable better understanding of the biology of this cancer but may lead to better diagnostics and therapeutic implications.

Large scale statistical analysis of existing gene profiles of this cancer may lead to identification of driver mutations and metabolic pathways. This may guide researchers in the right direction for pursuing clinical research which subsequently may lead to change in management paradigms.

The University of Texas MD Anderson Cancer Center
Source: newswise.com

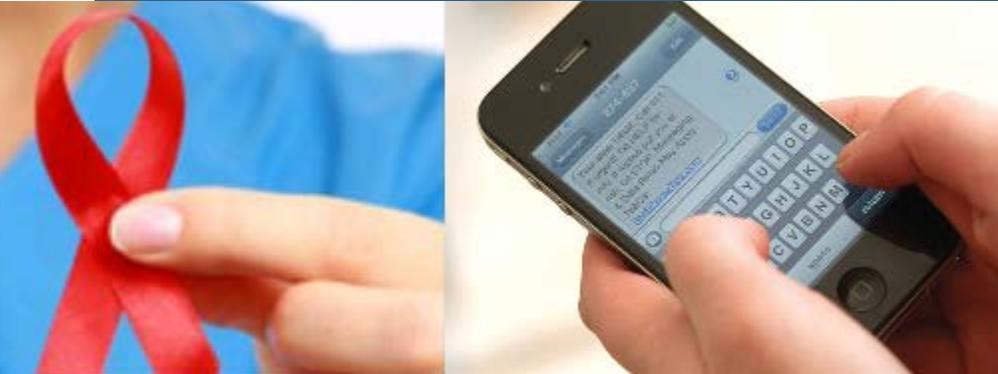# HIV Retention to Care

Image source: http://www.aids.gov/hiv-aids-basics/, http://www.mosio.com/mobile answers/text-messaging-news-texting-program-targets-new-moms-health-messages-to-be-sent-via-cellphone-lausd-students-share-hivstd-statuses-via-text-message/

Text Message Intervention to Increase Retention to Care in HIV Infected Women

By: YILING WU

This summer, I worked with Dr. Tanvir Bell on a behavioral text message intervention to improve retention to care in women with HIV. The behavioral intervention is part of a research study conducted at The University of Texas Medical School and Thomas Street Clinic.

To meet the main goal of the study (i.e., improving treatment adherence), I designed text messages reminding and encouraging women to take their medications and come into clinic.

Secondary issues that we focused on were substance abuse, depression, and social stigma; the text messages included coping strategies to deal with each of these issues.

In addition to writing the text messages, I also assisted in designing survey questionnaires and creating patient handouts.

Public Health Significance

The Public Health Essential Services (PHES) from the American Public Health Association that most closely relate to my practicum experience are "**Inform, educate and empower** people about health issues" and "**Research** for new insights and innovative solutions to health problems".

The project that I am involved in contributes to public health because it strives to improve adherence to antiretroviral therapy among a specific undeserved population in Houston. My host organization, The University of Texas Medical School, contributes to public health through its various research endeavors and involvement in community health care.

Lastly, Thomas Street Clinic is a HIV/AIDS clinic that partners with physicians from Baylor and UTHealth to provide health care and social services to those diagnosed with HIV/AIDs.

Thomas Street Clinic.
Image source:
https://www.harrishealth.org/en/services/locations/pages/thomas-street-health-center.aspx

Houston Medical Monitoring Project

A special HIV Surveillance Project

Just one more thing and we can complete the puzzle.
Houston Medical Monitoring Project

The Logo of HMMP is a puzzle. The idea is that HMMP is putting together a puzzle whose pieces include Access to Care, Quality of Life, Prevention Services, etc.

The piece that is missing is "you" which could be either the provider or patient.

MEDICAL MONITORING PROJECT

Factors Related to Changes in CD4+ Counts and Viral Load in Patients Living with HIV/AIDS - A Multilevel Analysis

By: Bo ZHAO

The Houston Medical Monitoring Project (HMMP) is a special HIV surveillance project conducted by the Houston Department of Health and Human Services in collaboration with the Centers for Disease Control and Prevention (CDC). The project is designed to provide local, state, national estimates of the clinical and behavioral characteristics of persons receiving HIV care in Houston/Harris County. Data are collected from an annual sample of 400 patients through personal interviews and medical record abstractions.

Public Health Significance

My practicum project relates to two components of the Essential Services of Public Health as follows:
1. *Monitor:* Data from the HMMP survey is used to monitor health care services utilization, quality of care, met and unmet needs, risk behaviors and preventive services for people living with HIV/AIDS.
2. *Evaluate:* Using the survey data, attempt was made at evaluating the impact of selected demographic, socio-economic and behavioral factors on treatment response to ART among patients in care over time.

My job:

1) Conduct quality assurance of survey data.
2) Data management – involved merging, appending, concatenating and developing new variables.
3) Identification of factors associated with CD4 count and viral load.
4) Use multilevel model to analyze this longitudinal data set and identify factors associated with CD4 count and viral load in HIV patient.

My final products:

1) Summary Report of Statistical Analysis

2) PowerPoint presentation of findings

My project:

The use of combinations of antiretroviral drugs (ART) generally results in the suppression of virus replication and hence increased levels of CD4. The success or failure in controlling levels in patients on antiretroviral therapy may be associated with factors related to treatment adherence, habits, other correlated infections unrelated to HIV, as well as socio-economic and psychosocial factors and access to healthcare. My project involved modeling the change in CD4 and Viral load associated with these factors by conducting a multilevel analysis.

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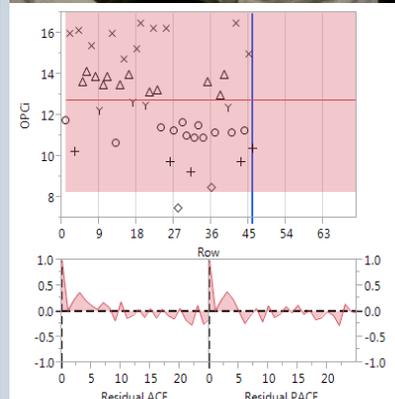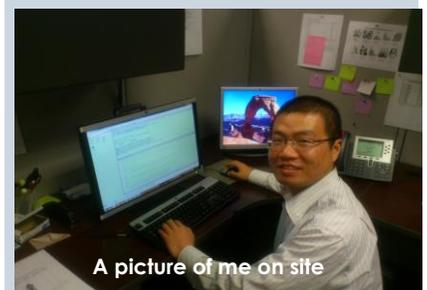
For more information regarding
The University of Texas School of Public Health,
Office of Public Health Practice
and the practicum program, please visit:
https://sph.uth.tmc.edu/practicum/