CERTIFICATE IN THE ANALYSIS OF MEDICAL DATA:
APPLIED BIOSTATISTICS FOR HEALTH CARE PROFESSIONALS

Jan   Feb   Mar   Apr   May   Jun   Jul

CERTIFICATE IN THE ANALYSIS OF MEDICAL DATA: APPLIED BIOSTATISTICS FOR HEALTH CARE PROFESSIONALS

January 10 & 11, 2025

Intermediate Applied Biostatistics
for Health Care Professionals

February 22, 2025

Intermediate Applied Biostatistics
for Health Care Professionals

April 12, 2025

Advanced Applied Biostatistics
for Health Care Professionals

🔍 Overview

Certificate in the Analysis of Medical Data: Applied Biostatistics for Health Care Professionals

Description:
The certificate consists of three workshops (Introductory, Intermediate, and Advanced) that enable healthcare professionals (HCP) to organize, manage, and analyze their data and to interpret and summarize its results accurately. The workshops will have a practical focus, and biostatistical concepts will be explained through case studies utilizing statistical software such as IBM-SPSS.

Gap Analysis/Need Assessment
Research is the main pillar for advancing science and healthcare for patients. Biostatistics plays a key role in research and is taught to students in many disciplines, such as business, engineering, social sciences, nursing, allied health, pharmacy, and medicine.

Healthcare workers from all disciplines and levels are expected to participate in or read about research at some point in their careers. A major obstacle for individuals conducting research is the need for assistance with data analysis (DeMets et al., 2006). Moreover, inadequate knowledge of biostatistical methods and interpretations might yield sub-optimal and potentially inaccurate results. It is thus important to provide proper and continuous post-university training for doctors and healthcare workers on biostatistics and its concepts (Okoro et al., 2019; Ercan et al., 2008).

As highlighted by the scientific committee members of the course, researchers from different disciplines in Qatar have indicated a high demand for training in applied biostatistics for students, faculty members, and healthcare practitioners in the various health sectors in Qatar. This training will enable researchers in Qatar to improve their research skills by effectively organizing, managing, and analyzing their data. This may lead to increased research output in Qatar, with healthcare professionals capable of analyzing their data with minimal assistance from biostatisticians.

References
Okoro PE, Karibi EN. Knowledge and Use of Biostatistics among Resident and Junior Doctors at the University of PortHarcourt Teaching Hospital, Port Harcourt. Niger J Surg. 2019 Jan-Jun;25(1):60-63. doi: 10.4103/njs.NJS_37_18.

DeMets DL, Stormo G, Boehnke M, Louis TA, Taylor J, Dixon D. Training of the next generation of biostatisticians: a call to action in the U.S. Stat Med. 2006; 25:3415–3429. [PubMed: 16927449]

Ercan I, Ozkaya G, Ocakoglu G, Yazici B, Sezer A, Ediz B, et al. Determining Biostatistics knowledge of students and physicians in medical school, Turkey. Interstat. 2008;3:1–7.

Overall Learning Objectives:
At the end of the three workshops, participants will be able to:

1. Enter and manage data using statistical software
2. Perform bivariate analysis for both continuous and dichotomous outcomes
3. Perform multivariate analysis for both continuous and dichotomous outcomes
4. Perform simple analysis for survival data

Target Audience
Physicians, Nurses, Dentists, Pharmacists, Allied Health Professionals, Students, Researchers, and Educators.

Accreditation

Disclosure of Relationships/Content Validity

It is the policy of Weill Cornell Medicine-Qatar to adhere to the Ministry of Public Health's Department of Healthcare Professions (DHP) and Accreditation Council for Continuing Medical Education (ACCME) Criteria, Policies, and Standards for Commercial Support and content validation to ensure fair balance, independence, objectivity, and scientific rigor in all its sponsored programs. All faculty participating in sponsored programs are expected to disclose relevant financial relationships pertaining to their contribution to the activity and any discussions of off-label or investigational uses of approved commercial products or devices or any products or devices not yet approved in the United States and elsewhere. WCM-Q CME/CPD activities are intended to be evidence-based and free of commercial bias.

Course Directors	Scientific Planning Committee
Thurayya Arayssi, MD Ziyad R. Mahfoud, Ph.D.	Mohammed Al-Saey, DDS Deema Al-Sheikhly, MEHP Nabila Chaabna, MSN Maguy S El Hajj, PharmD Stella Major, MD Vinoop Viswanathan, PT
Course Faculty	**Course Administrator**
Ziyad R. Mahfoud, Ph.D. Soha Dargham, MPH Padmakumari Sarada, MSc	Safia Rabia

The course directors, scientific planning committee members, faculty, and course administrator:

• Have no relevant financial/non-financial relationships with any for-profit/not-for-profit organizations to disclose.

• Will not be discussing unlabeled/unapproved use of drugs or products.

Evaluation

An evaluation will be conducted online after the activity. All participants are required to complete the Evaluation Form to qualify for a certificate. The evaluation will help assess the degree to which the activity achieved its objectives. It will also guide the planning of future activities and inform decisions about improving the educational program.

Certificates

An anonymous evaluation will be conducted online. All participants must complete the Evaluation Form to qualify for a certificate of attendance.

If a participant wishes to receive a certificate of completion, 'Certificate in the Analysis of Medical Data,' they must complete all three workshops (Introductory, Intermediate, and Advanced) and pass the test at the end of each activity.

Accreditation and Credit Designation Statements

ACCME
Weill Cornell Medicine-Qatar is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

Introductory Applied Biostatistics for Health care Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 10.00 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Intermediate Applied Biostatistics for Health Care Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 6.50 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Advanced Applied Biostatistics for Health care Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 7.00 *AMA PRA Category 1 Credits™*. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

DHP
Weill Cornell Medicine-Qatar is accredited as a provider of Continuing Medical Education (CME) and Continuing Professional Development (CPD) by the Department of Healthcare Professions (DHP) of the Ministry of Public Health.

Introductory Applied Biostatistics for Health care Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Department of Healthcare Professions-Accreditation Section and is approved for a maximum of 10.00 hours.

Intermediate Applied Biostatistics for Health care Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Department of Healthcare Professions-Accreditation Section and is approved for a maximum of 6.50 hours.

Advanced Applied Biostatistics for Health care Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Department of Healthcare Professions-Accreditation Section and is approved for a maximum of 7.00 hours.

The scientific planning committee has reviewed all disclosed financial relationships of speakers, moderators, facilitators and/or authors in advance of this CPD activity and has implemented procedures to manage any potential or real conflicts of interest.
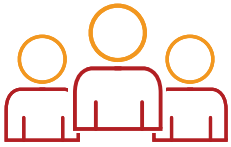
Scientific Planning Committee

Course Directors

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Weill Cornell Medicine-Qatar

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Vinoop Viswanathan, PT

Physiotherapist
Al Ahli Hospital

Program

Introductory Applied Biostatistics for Health Care Professionals

Learning Objectives:

At the end of this activity, participants will be able to:

1. Use IBM SPSS to enter, code and manage data

2. Summarize variables both in numbers and graphs

3. Use IBM SPSS to apply basic analysis of numeric outcomes and categorical outcomes

Agenda

Time	Topic	Learning Objectives	Speaker
Day 1 (Friday)			
1:30 pm - 2:00 pm	Opening Remarks, Accreditation, and Pre-test	Identify current knowledge pertaining to basics of applied biostatistics.	**Prof. Ziyad R. Mahfoud**
2:00 pm - 3:30 pm	Creating a Data Base in IBM-SPSS	1. Demonstrate an understanding of IBM-SPSS software interface. 2. Create a data base in IBM-SPSS. 3. Produce data for different types of variables.	**Prof. Ziyad R. Mahfoud** **Facilitator: Ms. Padmakumari Sarada**
3:30 pm - 4:00 pm	Break		
4:00 pm - 5:30 pm	Descriptive Statistics in IBM-SPSS	1. Compute descriptive statistics. 2. Demonstrate how to stratify analysis. 3. Demonstrate how to select a certain group of patients from a data base	**Prof. Ziyad R. Mahfoud** **Facilitator: Ms. Padmakumari Sarada**
Day 2 (Saturday)			
9:00 am – 10:30 am	Basic Data Management and Graphical Display of Your Data in IBM-SPSS	1. Generate data by creating new variables, recoding variables, and do data arithmetic. 2. Illustrate data using appropriate graphs.	**Prof. Ziyad R. Mahfoud** **Facilitator: Ms. Padmakumari Sarada**

Time	Topic	Learning Objectives	Speaker
10:30 am – 11:00 am	Coffee break		
11:00 am – 1:15 pm	Analysis of Numeric Outcomes in IBM-SPSS	1. Compute confidence interval for one mean and difference between two independent means. 2. Analyze data using one sample t-test, paired t-test, and independent t-test.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Padmakumari Sarada**
1:15 pm – 2:15 pm	Lunch break		
2:15 pm – 3:30 pm	Analysis of Dichotomous or Categorical Outcomes in IBM-SPSS	1. Compute the confidence interval for a proportion and difference between two independent proportions. 2. Analyze data using binomial test, Chi-squared test, Fisher's exact test, and McNemar's test.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Padmakumari Sarada**
3:30 pm – 4:00 pm	Coffee break		
4:00 pm – 5:00 pm	Case study: Analysis for a 2-parallel Arm Clinical Trial	1. Create suitable demographic and clinical characteristic summary table for a clinical trial. 2. Produce the most appropriate analysis for the outcomes in a 2-parallel arm clinical trial.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Padmakumari Sarada**
5:00 pm – 5:30 pm	Wrap-up and Post-test	1. Evaluate to which extent the learning objectives were met. 2. Summarize the key learning points.	**Prof. Ziyad R. Mahfoud**

Program

Online via Zoom and Face-to-Face at WCM-Q
February 22, 2025

Intermediate Applied Biostatistics for Health Care Professionals

Learning Objectives:

At the end of this activity, participants will be able to:

1. Develop a linear regression model to examine the relationship between a numeric dependent variable and one or more independent variables

2. Develop a logistic regression model to examine the relationship between a dichotomous dependent variable and one or more independent variables

3. Test for interaction in regression

4. Assess confounding in regression

Agenda

Time	Topic	Learning Objectives	Speaker
9:00 am – 9:15 am	Pre-test	Identify current knowledge pertaining to biostatistical concepts that will be covered in the current training.	**Prof. Ziyad R. Mahfoud**
9:15 am – 10:15 am	Review Material from First Training a. Descriptive statistics b. Analysis of numeric variables c. Analysis of categorical variables	1. Compute descriptive statistics 2. Demonstrate an understanding of analysis of numeric and categorical variables	**Prof. Ziyad R. Mahfoud** **Facilitator: Ms. Soha Dargham**
10:15 am – 11:45 am	Introduction to Regression a. Simple linear regression b. Simple logistic regression	At the end of this session, participants will be able to: Apply a simple linear regression and simple logistic regression to analyze their data.	**Prof. Ziyad R. Mahfoud** **Facilitator: Ms. Soha Dargham**
11:45 am – 12:15 pm	Break		
12:15 pm – 1:15 pm	Important Concepts in Regression a. Confounding b. Interaction c. Overfitting or underfitting in regression	1. Demonstrate an understanding of how to account for confounding variables in regression. 2. Demonstrate an understanding of interaction and how to test for it in regression. 3. Demonstrate an understanding of overfitting and underfitting in regression.	**Prof. Ziyad R. Mahfoud** **Facilitator: Ms. Soha Dargham**

Time	Topic	Learning Objectives	Speaker
1:15 pm – 2:15 pm	Lunch break		
2:15 pm – 3:30 pm	Multiple Linear Regression a. Analysis of the full Model b. Confounding interaction and collinearity in linear regression	1. Employ multiple linear regression to analyze a full model. 2. Demonstrate an understanding of confounding, interaction, and collinearity in linear regression.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
3:30 pm – 4:00 pm	Break		
4:00 pm – 5:15 pm	Multiple Logistic Regression a. Analysis of the full Model b. Confounding interaction and collinearity in logistic regression	1. Employ multiple logistic regression for the analysis of the full model. 2. Demonstrate an understanding of confounding, interaction and collinearity in logistic regression.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
5:15 pm – 5:30 pm	Wrap-up and Post-test	1. Evaluate to which extent the learning objectives were met. 2. Summarize the key learning points.	**Prof. Ziyad R. Mahfoud**

Program

Online via Zoom OR Face-to-Face at WCM-Q
April 12, 2025

Advanced Applied Biostatistics for Health Care Professionals

Learning Objectives:

At the end of this activity, participants will be able to:

1. Generate a multiple linear regression

2. Generate a multiple logistic regression

3. Analyze data from a one-way ANOVA

4. Analyze data using nonparametric statistics

5. Generate a Kaplan Meier Curve and compute median survival

6. Interpret Hazard Ratios and their confidence intervals

Agenda

Time	Topic	Learning Objectives	Speaker
9:00 am – 9:30 am	Pre-test	Identify current knowledge pertaining to biostatistical concepts that will be covered in the current training.	**Prof. Ziyad R. Mahfoud**
9:30 am – 10:45 am	Review Material from First and Second Training a. Descriptive statistics b. Analysis of numeric variables c. Analysis of categorical variables	1. Compute descriptive statistics. 2. Demonstrate an understanding of analysis of numeric and categorical variables. 3. Employ multiple linear regression to analyze a full model. 4. Employ multiple logistic regression to analyze a full model.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
10:45 am – 12:15 pm	Selecting Variables for Multiple Regression a. Computer based methods b. Other methods c. Application	1. Employ forward, backward and stepwise methods of variables selection for linear and logistic regression models. 2. Employ other methods of variables selection for linear and logistic regression.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**

Time	Topic	Learning Objectives	Speaker
12:15 pm – 12:30 pm	Break		
12:30 pm – 1:30 pm	One-way ANOVA a. Understanding the ANOVA table b. Multiple testing model c. How does it work with categorical variables	1. Employ one-way ANOVA and multiple testing procedures for numeric variables. 2. Employ Chi-squared test for multiple groups with pairwise comparison procedures.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
1:30 pm – 2:30 pm	Lunch Break		
2:30 pm – 3:45 pm	Nonparametric Tests a. For bivariate analysis b. For one way ANOVA	1. Demonstrate an understanding of the difference between parametric and non-parametric tests. 2. Apply nonparametric tests such as Wilcoxon's signed rank test, rank sum test, and the Kruskal Wallis test.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
3:45 pm – 4:00 pm	Break		
4:00 pm – 5:15 pm	Introduction to Survival Analysis a. Kaplan Meier Method and Curve b. Log Rank test and Hazard Ratio	1. Demonstrate an understanding of the concept of time to event and censoring. 2. Apply Kaplan Meier method to obtain survival estimates and curves. 3. Employ the log rank test. 4. Demonstrate an understanding of the concept of hazard ratio.	**Prof. Ziyad R. Mahfoud** **Facilitator:** **Ms. Soha Dargham**
5:15 pm – 5:30 pm	Wrap-up and Post-test	1. Evaluate to which extent the learning objectives were met. 2. Summarize the key learning points.	**Prof. Ziyad R. Mahfoud**

Faculty

Ziyad R. Mahfoud, Ph.D.
Professor of Research in Population Health Sciences
Weill Cornell Medicine-Qatar

Dr. Ziyad Mahfoud joined Weill Cornell Medicine-Qatar (WCM-Q) in 2010 and currently holds the position of professor of research in population health sciences.

He obtained his Ph.D. in statistics from the University of Florida, US, and has previously taught at the University of Kentucky, US, and the American University of Beirut, Lebanon.

Dr. Mahfoud's principal focus is designing and analyzing epidemiological and interventional studies. He is an expert in clinical trials and has served as an advisor and consultant to several pharmaceutical companies and international organizations, including WHO, UNAIDS, IOM, and UNICEF. Dr. Mahfoud has published over 150 peer-reviewed articles with local and international collaborators.

Over the past 20 years, Dr. Mahfoud has conducted training in biostatistics, scientific writing, and research methodologies worldwide. He has won numerous teaching awards in recognition of his ability to make biostatistics easily comprehensible.

Soha Dargham, MPH
Senior Biostatistician
Weill Cornell Medicine-Qatar

Soha Dargham is a senior biostatistician at Weill Cornell Medicine-Qatar (WCM-Q). She is the lead statistician for several ongoing projects and has conducted introductory biostatistics workshops for research staff and medical interns. As a biostatistician and researcher, she aims to deliver high-quality statistical analyses and results while aspiring to be a product-oriented researcher.

With over seven years in the research industry, Ms. Dargham utilizes her research skills and acquired knowledge to enhance, promote, and expand research. She enjoys translating numbers and data statistics into compelling narratives and identifying research priorities that can be utilized by clinicians, health policymakers, and the public to make evidence-based decisions in public health.

Ms. Dargham obtained her BSc from the University of Wisconsin-Madison, US, and her MPH from the American University of Beirut, Lebanon. She is fluent in English, Arabic, and French.

Padmakumari Sarada, MSc
Teaching Specialist in Math and Statistics
Weill Cornell Medicine-Qatar

Padmakumari Sarada is a teaching specialist in math and statistics at Weill Cornell Medicine-Qatar (WCM-Q) and previously served as a learning lab specialist in the science program of Texas A&M University at Qatar. She holds master's degrees in mathematics and statistics and a bachelor of education from Kerala University, India. Ms. Sarada is currently pursuing a Ph.D. in education at the Richard W. Riley College of Education and Leadership, US.

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