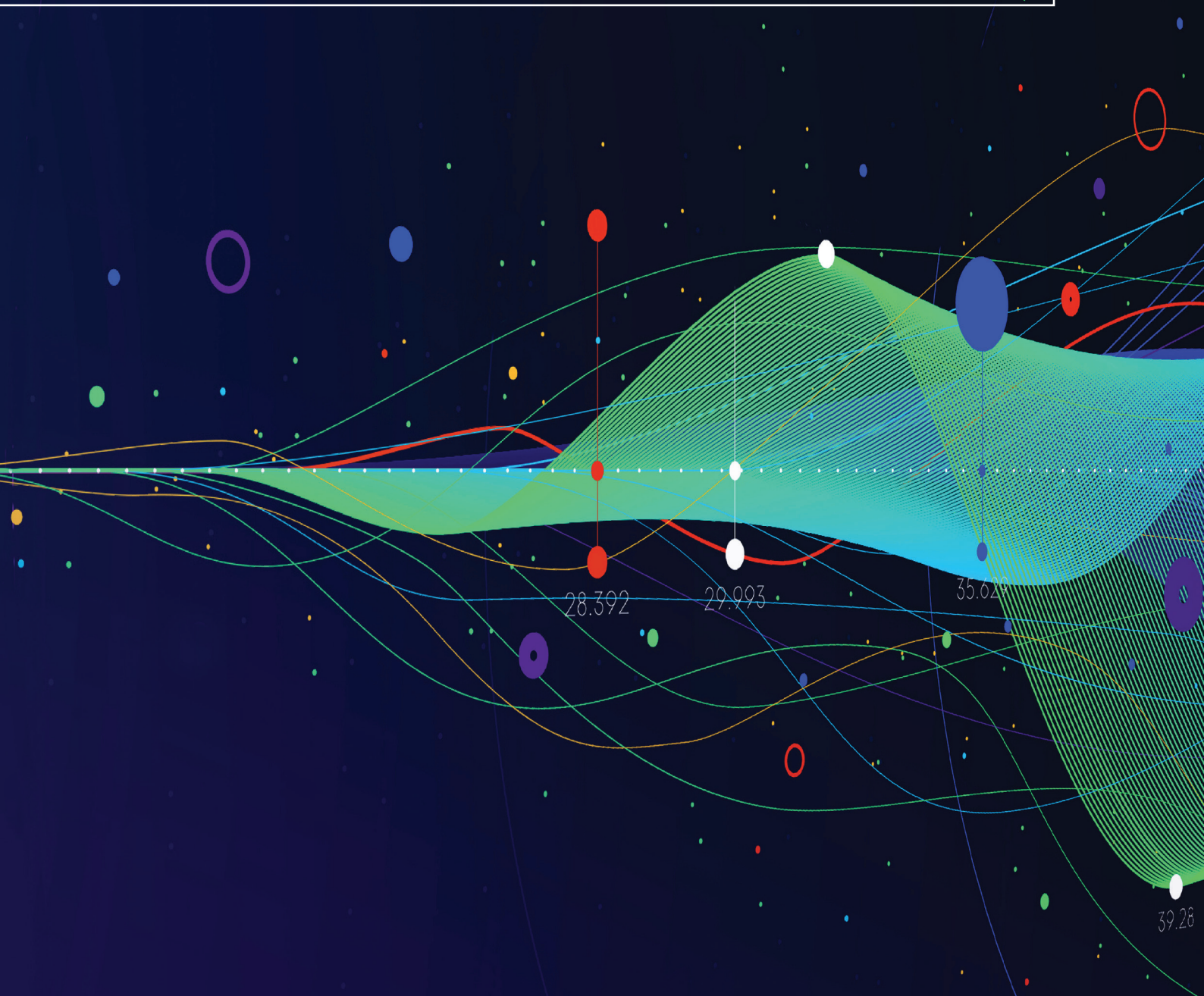
Weill Cornell Medicine-Qatar
Continuing Professional Development

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



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

January 15 & 16, 2021
Introductory Applied Biostatistics for Health Care Professionals

February 20, 2021
Intermediate Applied Biostatistics for Health Care Professionals

March 20, 2021
Advanced Applied Biostatistics for Health Care Professionals

Overview

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

Description:
This is a series of three workshops (introductory, intermediate and advanced) aimed at enabling health care professionals (HCP) to organize, manage, and analyze their data and properly interpret and summarize its results. The workshops will be applied in nature where biostatistical concepts will be explained through case studies using a statistical software package, such as IBM-SPSS.

Gap Analysis/ Need Assessment

Research is the main pillar for the advance of science and the improvement of healthcare for patients. Biostatistics plays a key role in research. Biostatistics is taught for students in many disciplines, such as business, engineering, social sciences, nursing, allied health, pharmacy and medicine. Healthcare workers from all disciplines and all levels are expected to participate in or read about research at some point in their career. A major obstacle for people undertaking research is the inability to find help with data analysis (DeMets et al, 2006). Moreover, inadequate knowledge of biostatistical methods and interpretation might yield sub-optimal and possibly incorrect results. It is thus important to have proper and continuous post-university training for doctors and healthcare professionals in biostatistics and its concepts (Okoro et al 2019, Ercan et al 2008). Researchers from different disciplines in Qatar, as represented by scientific committee members of this course, have indicated that training in applied biostatistics is needed for students, faculty members and healthcare practitioners in the various health sectors in Qatar. This training will help researchers in Qatar improve their skills in research by being able to organize, manage and analyze their data. This could help increase research output in Qatar, with healthcare professionals equipped with the ability to analyze their data with minimal help, if any, from biostatisticians.

Overall Learning Objectives:

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

1. Enter and manage data using a 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, Educators.

Accreditation

Disclosure of Relationships/Content Validity

It is the policy of Weill Cornell Medicine-Qatar to adhere to Department of Healthcare Professions (DHP) and Accreditation Council for Continuing Medical Education (ACCME) Criteria, Policies, and Standards for Commercial Support and content validation in order 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 of 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, PhD	Mohammed Al-Saey, DDS Deema Al-Sheikhly, MEHP Bruce MacRae, MSc Stella Major, MD Maguy S El Hajj, PharmD Vahe Kehyayan, PhD Daniel Rainkie, PharmD
Course Faculty	**ICR**
Ziyad R Mahfoud, PhD Deema Al-Sheikhly, MEHP Soha Dargham, MPH Mark Healy, MSc Syed Latifi, PhD Padmakumari Sarada, MSc	Ziyad R Mahfoud, PhD

- Have no relevant financial relationship to disclose.
- Will not be discussing unlabeled/unapproved use of drugs or products.

Course Administrator

Safia Rabia

- Has disclosed the following: Spouse, employee of Al-Wehda Medical Group.
- Will not be discussing unlabeled/unapproved use of drugs or products.

Evaluation

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

Accreditation and Credit Designation Statements

ACCME

The 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 Healthcare Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 10.0 *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 Healthcare Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 6.5 *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 Healthcare Professionals
The Weill Cornell Medicine-Qatar designates this live activity for a maximum of 7 *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 Healthcare Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Ministry of Public Health's Department of Healthcare Professions - Accreditation Section and is approved for a maximum of 10.00 hours.

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

Advanced Applied Biostatistics for Healthcare Professionals
This activity is an Accredited Group Learning Activity (Category 1) as defined by the Ministry of Public Health's Department of Healthcare Professions - Accreditation Section and is approved for a maximum of 7 hours.

Scientific Planning Committee

Course Directors

Thurayya Arayssi, MD

Senior Associate Dean for Medical Education and CPD
Professor of Clinical Medicine
Weill Cornell Medicine-Qatar

Ziyad R Mahfoud, PhD

Associate Professor of Healthcare Policy and Research
Weill Cornell Medicine-Qatar

Members

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College of the North Atlantic Qatar

Stella Major, MD

Associate Professor of Family Medicine in Clinical
Weill Cornell Medicine-Qatar

Daniel Rainkie, PharmD

Clinical Lecturer
Qatar University College of Pharmacy

Program January 15 & 16, 2021

Introductory Applied Biostatistics for Health Care Professionals

Overall 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	Session Learning Objectives	Speaker
Day 1 (Friday)			
1:30 pm - 2:00 pm	Opening remarks, accreditation and pre-assessment	Identify current knowledge pertaining to basics of applied biostatistics	
2:00 pm - 3:30 pm	Creating a data base in IBM-SPSS	At the end of this session, participants will be able to: 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	**Dr. Ziyad Mahfoud** **Facilitators:** - Ms. Deema Al-Sheikhly - Ms. Soha Dargham - Ms. Padmakumari Sarada
3:30 pm - 4:00 pm	Coffee break		
4:00 pm - 5:30 pm	Descriptive Statistics in IBM-SPSS	At the end of this session, participants will be able to: 1. Compute descriptive statistics 2. Demonstrate how to stratify analysis 3. Demonstrate how to select a certain group of patients from a data base	**Dr. Ziyad Mahfoud** **Facilitators:** - Ms. Deema Al-Sheikhly - Ms. Soha Dargham - Ms. Padmakumari Sarada
Day 2 (Saturday)			
9:00 am – 10:30 am	Basic Data Management and Graphical Display of your data in IBM-SPSS	At the end of this session, participants will be able to: 1. Manage data by creating new variables, recoding variables, and do data arithmetic 2. Illustrate data using appropriate graphs	**Dr. Ziyad Mahfoud** **Facilitators:** - Ms. Deema Al-Sheikhly - Ms. Soha Dargham - Ms. Padmakumari Sarada
10:30 am – 11:00 am	Coffee Break		
11:00 am – 1:15 pm	Analysis of numeric outcomes in IBM-SPSS	At the end of this session, participants will be able to: 1. Compute confidence interval for one mean and difference between two independent means 2. Analysis data using one sample t-test, paired t-test and independent t-test	**Dr. Ziyad Mahfoud** **Facilitators:** - Ms. Deema Al-Sheikhly - Ms. Soha Dargham - 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	At the end of this session, participants will be able to: 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, McNemar's test	**Dr. Ziyad Mahfoud** **Facilitators:** - Ms. Deema Al-Sheikhly - Ms. Soha Dargham - 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	At the end of this session, participants will be able to: 1. Create suitable demographic and clinical characteristic summary table for a clinical trial 2. Run the most appropriate analysis for the outcomes in a 2 parallel arm clinical trial	**Dr. Ziyad Mahfoud** **Facilitators:** - Ms. Deema Al-Sheikhly - Ms. Soha Dargham - 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	

Program February 20, 2021

Intermediate Applied Biostatistics for Health Care Professionals

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

1. Fit a linear regression to examine the relationship between a numeric dependent variable and one or more independent variables
2. Fit a logistic regression 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	Session Learning Objectives	Speaker
Day 1 (Friday)			
8:30 am – 9:00 am	Complete registration and ensure that the statistical software works		
9:00 am – 9:15 am	Pre-test	1. Identify current knowledge pertaining to biostatistical concepts that will be covered in the current training	**Dr. Ziyad Mahfoud** Facilitators: - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
9:15 am – 10:15 am	Review material from first training a. Descriptive statistics b. Analysis of numeric variables c. Analysis of categorical variables	At the end of this session, participants will be able to: 1. Compute descriptive statistics 2. Demonstrate an understanding of analysis of numeric and categorical variables	**Dr. Ziyad Mahfoud** Facilitators: - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
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: 1. Apply a simple linear regression and simple logistic regression to analyze their data	**Dr. Ziyad Mahfoud** Facilitators: - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
11:45 am – 12:15 pm	Coffee break		
12:15 pm – 1:15 pm	Important concepts in Regression a. Confounding b. Interaction c. Overfitting or underfitting in regression	At the end of this session, participants will be able to: 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	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
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	At the end of this session, participants will be able to: 1. Employ multiple linear regression to analyze a full model 2. Demonstrate an understanding of confounding, interaction and collinearity in linear regression	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
3:30 pm – 4:00 pm	Coffee break		
4:00 pm – 5:15 pm	Multiple logistic regression a. Analysis of the full Model b. Confounding interaction and collinearity in logistic regression	At the end of this session, participants will be able to: 1. Employ multiple logistic regression for the analysis of the full model 2. Demonstrate an understanding of confounding, interaction and collinearity in logistic regression	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
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	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy

Program March 20, 2021

Advanced Applied Biostatistics for Health Care Professionals

Overall 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. Fit a Kaplan Meier Curve and compute median survival
6. Interpret Hazard Ratios and their confidence intervals

Agenda

Time	Topic	Session Learning Objectives	Speaker
Day 1 (Friday)			
8:30 am – 9:00 am	Complete registration and ensure that the statistical software works		
9:00 am – 9:30 am	Pre-test	1. Identify current knowledge pertaining to biostatistical concepts that will be covered in the current training	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
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	At the end of this session, participants will be able to: 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	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
10:45 am – 12:15 pm	Selecting variables for multiple regression a. Computer based methods b. Other methods c. Application	At the end of this session, participants will be able to: 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	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
12:15 pm – 12:30 pm	Coffee 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	At the end of this session, participants will be able to: 1. Employ one-way ANOVA and multiple testing procedures for numeric variables 2. Employ Chi-squared test for multiple groups with pairwise comparison procedures	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
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	At the end of this session, participants will be able to: 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	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
3:45 pm – 4:00 pm	Coffee break		
4:00 pm – 5:15 pm	Introduction to Survival Analysis a. Kaplan Meier Method and Curve b. Log Rank test and Hazard Ratio	At the end of this session, participants will be able to: 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	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy
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	**Dr. Ziyad Mahfoud** **Facilitators:** - Dr. Syed Latifi - Ms. Soha Dargham - Mr. Mark Healy

Faculty

Dr. Ziyad Mahfoud, PhD

Associate Professor of Population Health Sciences
Weill Cornell Medicine-Qatar

Dr. Ziyad Mahfoud received his PhD in statistics from the University of Florida and has since taught at the University of Kentucky, the American University of Beirut and, for the last 10 years, at Weill Cornell Medicine-Qatar, where he holds the position of associate professor of population health sciences.

The principal focus of Dr. Mahfoud's work is the design and analysis of epidemiological and interventional studies, and he is also an expert in clinical trials. To date, Dr. Mahfoud has more than 120 peer-reviewed articles to his name, published with local and international collaborators on a diverse range of topics. He has served as advisor and consultant to several pharmaceutical companies and international organizations including WHO, UNAIDS, the International Organization for Migration (IOM), and UNICEF.

In the past 20 years, Dr. Mahfoud has worked all over the world, delivering training in the fields of biostatistics, scientific writing and research methodologies. He has won numerous teaching awards in recognition of his ability to make biostatistics easily comprehensible and his dedication to his students.

Soha Dargham, MPH

Senior Research Specialist
Weill Cornell Medicine-Qatar

Ms. Dargham is currently a Senior Research Specialist working in the Biostatistics, Epidemiology and Biomathematics Research Core at Weill Cornell Medicine-Qatar, Cornell University. She is the lead statistician for several ongoing projects. She also presented several introductory biostatistics workshops for research staff and medical interns. She enjoys translating the numbers and data statistics into stories and identifying research priorities, which in turn can be used by clinicians, health policy makers, and the public to make public health evidence informed decisions. She earned her BSc from the University of Wisconsin-Madison, USA, and MPH from the American University of Beirut, Lebanon. She is fluent in English, Arabic and French.

Deema Al-Sheikhly, MEHP

Director, Continuing Professional Development
Weill Cornell Medicine-Qatar

Ms. Al-Sheikhly is the Director of the division of Continuing Professional Development at the Weill Cornell Medicine - Qatar (WCM-Q). In this position, she is responsible for directing the overall educational program and maintaining the division's mission and strategic plan as well as providing strategic oversight for the development and maintenance of the infrastructure of the division. She co-led the division in attaining local recognition of WCM-Q as a provider of Continuing Medical Education (CME) and Continuing Professional Development (CPD) as well as International recognition by the Accreditation Council for Continuing Medical Education (ACCME) as a provider of continuing medical education for physicians. Thereby, WCM-Q became amongst the first institutions in the world, outside of the US, to be recognized as an accredited provider by the ACCME and to have the rights and responsibility to designate AMA PRA Category 1 Credit(s)TM.

In her previous role as Manager for Graduate Medical Education (GME) at WCM-Q, she provided academic and administrative support to WCM-Q's Associate Dean for GME. This included support of the affiliate hospital in restructuring the residency programs to meet the ACGME-I accreditation standards. She was instrumental in developing an Internal Review process, which was highly commended by ACGME-I. Ms. Al-Sheikhly joined WCM-Q in 2006 as Clinical Curriculum Administrator, Office of Curriculum Support. In this position, she was instrumental in setting up the clinical clerkships and providing administrative and organizational support to the course and clerkship directors. In that period of time, she took the opportunity to complete a certificate in Management Essentials: Managing Performance from Cornell University through eCornell. She also obtained a Clerkship Administrator Certificate from the AAMC Central Group on Educational Affairs and submitted a project report to the same association on clerkship time of year bias at WCM-Q.

Ms. Al-Sheikhly earned her Bachelor of Science (Hons) in Biotechnology from Kings College London, Masters of Research in Bioprocessing from University College London and Master of Education in the Health Professions from Johns Hopkins University, USA. Prior to joining WCM-Q, she was working as a research assistant in a biopharmaceutical company (GroPep PTY Ltd) in Adelaide, South Australia, while pursuing her PhD on detection of flaviviruses.

Faculty

Mark Healy, MSc

Education Assessment Analyst
Weill Cornell Medicine-Qatar

Mr. Healy is an Education Assessment Analyst at WCM-Q. He holds an MSc in Statistics with Medical Applications from the University of Sheffield and a BSc in Financial Mathematics from the University of Limerick.

He has experienced in applying statistics in both academia and industry – with a career spanning consultancy-based roles, financial services, aviation and academia.

His research interests include program assessment and evaluation, as well as the application of statistics in industry.

Syed Latifi, PhD

Education Assessment Manager, Division of Medical Education
Weill Cornell Medicine-Qatar

Dr. Syed Latifi, PhD, is a computer scientist and psychometrician by training, with over ten years of national and international experience in assessment, evaluation, educational innovations, data sciences, and training.

Dr. Latifi joined Weill Cornell Medicine - Qatar (WCM-Q) in 2016 and is currently responsible for overseeing programmatic evaluation and CQI (Continuous Quality Improvement) processes. Prior to joining WCM-Q he worked for the: i) University of Alberta with Tier-I Canada Research Chair in Educational Measurement, where he also completed his doctoral program; and ii) Aga Khan University-Examination board where he led testing and operations of national assessments.

His current research interest includes evaluation and big-data analytics, educational data mining, and statistical modeling using the R programming language. His professional interests include regulation, accreditation, and educational development. He is a member of, and regular presenter at the American Evaluation Association, American Educational Research Association, and National Council on Measurement in Education.

Padmakumari Sarada, MSc

Teaching Specialist in Math and Statistics
Weill Cornell Medicine-Qatar

Ms. Sarada is a Teaching Specialist in Math and Statistics at Weill Cornell Medicine-Qatar and previously served as Learning Lab Specialist in the science program at Texas A&M-Qatar.
She holds a Masters in Statistics, Master's in Mathematics, and Bachelor's in Education from Kerala University, India. Ms. Sarada is currently pursuing PhD in Education at Richard W Riley College of Education & Leadership, USA.

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