BIOGRAPHICAL SKETCH

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NAME: **GEBREGZIABHER**, Mulugeta, (PhD)

eRA COMMONS USER NAME (credential, e.g., agency login): GEBREGZ

POSITION TITLE: Research Health Scientist/Co-Lead Biostat Core COIN, Ralph H. Johnson VAMC
Professor of Biostatistics, Department of Public Health Science, MUSC

EDUCATION/TRAINING: *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Addis Ababa University, Addis Ababa, Ethiopia	BS	1994	Statistics
Addis Ababa University, Addis Ababa, Ethiopia	MS	1998	Statistics
University of Southern California, Los Angeles, CA	PhD	2006	Biostatistics

A. Personal Statement

I have expertise, experience and motivation to lead this project and to contribute to the design and analysis of the proposed project. My record shows productive research work in areas highly related to the proposed research. I have published over 160 papers where the majority of these are published in high tier medical and biostatistics journals. I have also contributed (as PI, Co-I, or Project leader) to about 32 funded NIH and VA-HSR&D and intramural pilot grants. I have contributed to improvements in the quality of research output in studies of patient care and outcomes such as stroke, diabetes, cardiovascular disease, lung cancer, heart failure, reading disability, kidney disease, cancer and HIV/AIDS. I have collaborated with the principal and co-investigators of the project for the last several years. I have contributed novel methods for the design and analysis of randomized trials, health services and outcomes and heath disparity studies for VA and non-VA studies. My specialty includes areas such as statistical methodology development for longitudinal studies, health services and outcomes data, missing data, analysis of correlated (longitudinal/clustered) data, semi-continuous data, joint modeling of multivariate outcomes, fMRI data analysis, latent class modeling and analysis of very large datasets among other things. I have worked with both randomized and observational studies design and analysis both in the US and Africa. As demonstrated by my publications and research funding, I have led multiple new statistical methodology development publications and presented at national and international conferences. My current methodology development projects include modeling multivariate longitudinal outcomes from neurodegenerative diseases, multimorbidity modeling, risk prediction, missing data, analysis of semi-continuous data, estimating global effect of covariates and analysis of aggregate count data from complex surveys which may include zero-inflation and over-dispersion. I have experience teaching graduate courses in Biostatistics and Epidemiology and mentoring PhD and MS students as well as junior faculty. I have mentored 12 (8 PhD, 4 MS) students, 5 junior faculty, and 2 postdoctoral fellows. I have been serving as member of journal editorial boards and reviewer of manuscripts and grants. I can assume roles that include: 1) providing leadership for projects including the daily management of project goals and staff; 2) mentoring research associates and post-doctoral fellows who are involved in data management and analysis; 3) providing guidance and feedback in the proposed development of methods and software tool; 4) developing methods for analysis of data; 5) providing guidance on institutional and federal regulatory responsibilities; and 6) communicating results of research to the scientific community. I have experience with the use and application of SAS, Stata, R and WinBugs. With my expertise and experience in study design and analysis of biomedical studies, I will contribute to the success of the proposed project.

B. Positions and Honors

Positions and Employment

1994-1996 Graduate Assistant, Statistics Department, Addis Ababa University, Ethiopia
1995-1996 Consultant, World Bank, Ethiopia
1996-1998 Assistant Lecturer, Department of Statistics, Addis Ababa University, Ethiopia

1996-1998 Consultant, UN-Economic Commission for Africa, Ethiopia
1998-2001 Lecturer, Department of Statistics, Addis Ababa University, Ethiopia
1999-2001 Consultant, Bureau of Agriculture and Natural Resources, Ethiopia
2001-2002 Teaching Assistant, Bowling Green State University, Bowling Green, OH
2002-2006 Research and Teaching Assistant, University of Southern California, Los Angeles, CA
2006-2012 Assistant Professor, Division of Biostatistics & Epidemiology, MUSC, Charleston, SC
2012-2013 Associate Professor, Division of Biostatistics & Epidemiology, MUSC, Charleston, SC
2013-2016 Associate Professor, Department of Public Health Sciences, MUSC, Charleston, SC
2015-NOW Co-Lead, Biostatistics Core, Charleston VA Innovation Center, Charleston, SC
2016-NOW Professor, Department of Public Health Sciences (DPHS), MUSC, Charleston, SC
2016-NOW Research Health Scientist, Charleston VA, HEROIC innovation center, Charleston, SC
2017-NOW Vice Chair for Academic Programs, DPHS, MUSC, Charleston, SC

Other Experience and Professional Membership

2002-2007 Member, Biometric Society, Western North American Region (WNAR)
2006-2007 Scientific Reviewer, NIH, CDC, Michael J. Fox Foundation
2004-Present Member, American Statistical Association
2005-Present Member, American Statistical Association (ASA)
2006-Present Journal article reviewer for more than 22 journals (eg. Diabetes Care, BMJ-Heart, JGIM, Biometrics, JCSDA, JRSS-A, JRSS-C, SIM, JSPI, JESA, SMMR)
2006-Present Member, Biometric Society, Eastern North American Region (ENAR)
2011-2012 President Elect, Statistical Society of Ethiopians in North America (SSENA)

Honors/Awards

1994 Dean's List, Addis Ababa University, Ethiopia
1999 Laureate Young Researcher, Development Cooperation Prize, Belgium
1999 Eastern and Southern Africa Gender Research Grant Competition Award, Ethiopia
2000 Ethiopian American Foundation Research Award, United States of America
2005 Best Poster award- USC Department of Preventive Medicine Poster Contest
2006 MUSC Provost Faculty Development Award
2006 Best Academic Achievement Award, University of Southern California
2007 Travel Award, JSM 2007-Statistics in Epidemiology Section
2008 Travel Award - ENAR-2008 International Biometric Society
2011-2012 Vice President- American Statistical Association SC Chapter
2012 President, Statistical Society of Ethiopians in North America
2013-2015 President, American Statistical Association SC Chapter
2014-2016 Senator, MUSC Faculty Senate
2014-present Editorial Board (BMJ-Heart, J Biometrics and Biostatistics)
2015-present Scientific Reviewer- CDC Special Emphasis Panel (DP15-001) – Natural Experiments of the Impact of Population-Targeted Health Policies to Prevent Diabetes
2015-present Scientific Reviewer- Oral Health Research Pilot grants review panel, MUSC
2015-present Scientific Reviewer- Center for Global Health Pilot grants review panel, MUSC
2015-present Scientific Reviewer- NIH Population Sciences and Epidemiology Integrated Review Group
2015-present Scientific Reviewer- NIH Cancer, Cardiovascular &Sleep Epidemiology Panel B Study Section
2015-present Scientific Reviewer- NIH KNOD study section
2017 Nominated for MUSC Foundation Mentoring Award, MUSC, Charleston, SC
2017 Mentoring Award, Department of Public Health Sciences, MUSC, Charleston, SC

C. Contribution to Science

1. **Missing data and joint modeling of multivariate outcomes**: My publications on Biostatistics methodology development contribute to novel ways of analyzing data from national medical records that are characterized by multivariate health outcomes, missing data, large sample size and clustering. My methodology work on **missing data has been very useful to addressing biases that can arise due to missing covariate data**. This has been extended to pooled analysis of matched and unmatched case-control studies and analysis of case-control data from multi-site studies. My contribution latent class multiple imputation has helped in proper handling of missing race data. My work on joint modeling of multivariate longitudinal outcomes has been instrumental to understand the differential effect of covariates such as non-medication adherence on different sources of medical cost. This approach has been extended to analysis of hearing acuity data that is

measured from multiple frequencies. This joint modeling approach has its application in modeling the effect of time varying covariates (longitudinally observed exposure or treatment) on mortality which helped to model the relationship between the trajectory of HgBA1c control and mortality.

a. **Gebregziabher M,** Zhao Y, Dismuke C, Axon N, Hunt K, Egede LE. Joint modeling of longitudinal multiple source cost data using multivariate generalized linear mixed models. Health Services and Outcomes Research Methodology, 2012; Doi: 10.1007/s10742-012-0103-0
b. **Gebregziabher M** and DeSantis, S. (2010). A latent class based multiple imputation approach for missing categorical data. Journal of Statistical Planning. Inference, doi:10.1016/j.jspi.2010.04.020
c. Eckert MA, Berninger VW, Vaden KI Jr, **Gebregziabher M**, and Tsu L. Gray Matter Features of Reading Disability: A Combined Meta-Analytic and Direct Analysis Approach. eNeuro. 2016 Jan 23;3(1). pii: ENEURO.0103-15.2015. doi: 10.1523/ENEURO.0103-15.2015.PMID:26835509
d. Vaden KI Jr, **Gebregziabher M**, Kuchinsky SE, Eckert MA. Multiple imputation of missing fMRI data in whole brain analysis. Neuroimage. 2012 Apr 15;60(3):1843-55. Epub 2012 Feb 10. PMID 22500925

2. **Health services, outcomes and disparity research**: My collaborative work with investigators has also led to impactful research that led to publications in high tier journals (Eg. Diabetes Care, CHEST). I have made contributions to the design and analysis of studies that advanced our understanding of racial/ethnic, regional, and geographic disparities in diabetes disease control, medication adherence, and health outcomes using national longitudinal data from a cohort of Veterans with type 2 diabetes mellitus. I have also contributed to HSR&D funded merit grants focused on health disparities and outcomes research. I have played key role in disseminating out work by publishing in high tier journals and presenting in national and international conferences.
   a. Tanner N, **Gebregziabher M**, Halbert CH, Payne E, Egede L, Silvestri G. Racial Differences in Outcomes within the National Lung Cancer Screening Trial: Implications for widespread implementation. Am J Respir Crit Care Med. 2015 Apr 30. [Epub ahead of print] PMID: 25928649
   b. Tanner N, Khndora N, **Gebregziabher M**, Halbert CH, Payne E, Egede L, Silvestri G. The association between smoking abstinence and mortality in the National Lung Screening Trial. Am J Respir Crit Care Med (in press). 2015 Oct 26. [Epub ahead of print] PMID: 26502000
   c. Tanner NT, Dai L, Bade BC, **Gebregzhber M,** Silvestri GA. Assessing the Generalizability of the National Lung Screening Trial in an Elderly Population: A Comparison of Outcomes for Stage 1A Patients. Am J Respir Crit Care Med. 2017 Sep 1;196(5):602-608. PMID: 28722466
   d. Walker R, **Gebregziabher M**, Martin-Harris B, Egede L. Independent Effects of Socioeconomic and Psychological Social Determinants of Health on Self-Care and Outcomes in Type 2 Diabetes. Gen Hosp Psychiatry. 2014 Nov-Dec;36 (6):662-8. PMC4254055
3. **Methods for the analysis of data with point mass at zero**: My recent work focuses on development of methods for the analysis of semi-continuous data that are characterized by point mass at zero. These types of data are common in addiction disorder studies (alcohol consumption, drug use), medical cost studies, disability studies and antibody concentration studies. These types of data cannot be accurately modeled using traditional generalized linear models. Our work contributes to the effort to come up with models that provide more accurate and sensible estimators of covariate effect in data characterized by point mass at zero. We have developed software tools that can help data analysts to easily implement these models in analysis of data. We have implemented these models to assess the effect of group motivational interviewing on several substance use and treatment engagement outcomes relative to treatment as usual in a randomized trial setting. There have been challenges to fit certain complex statistical models to very large data sets with the current state of computational tools.
   a. **Gebregziabher M**, Voronca D, Teklehaimanot A, Santa Ana EJ. Weibull mixture regression for marginal inference in zero-heavy continuous outcomes. Stat Methods Med Res. 2015 Apr 22. pii: 0962280215583402. [Epub ahead of print] PMID:25902801
   b. Payne E, Hardin JW, Egede LE, Viswanathan R, Selassie A, **and Gebregziabher M**. Approaches for dealing with various sources of overdispersion in modeling count data: Scale adjustment versus modeling. Stat Methods Med Res. 2015 May. PMID:26031359
   c. Ellerbe CN**, Gebregziabher M,** Korte J, Mauldin J, Hunt K. Quantifying the impact of GDM, maternal weight and race on birth weight via quantile regression. PLoS One, 2013 Jun 10; 8(6). PMC3677894
4. **Analysis of very large national databases:** I have experience with the analysis of very large national data bases such as NHANES, MEPS, National VA data and SEER-Medicare. I have contributed methods for robust modeling of longitudinal data in very large datasets. My recent work on missing fMRI data has been

helpful in creating awareness in the neuroimaging community on how missing data could lead to biased inference and possible ways of mitigating its impact.

a. **Gebregziabher M**, Egede LE, Gilbert GE, Hunt KJ, Nietert PJ and Mauldin P. Fitting parametric random effects models in very large data sets: An application to VHA national data. BMC Med Res Methodol. 2012 Oct 24;12(1):163. PMC3542162
b. Hunt KJ, **Gebregziabher M**, Egede LE. Racial and Ethnic Differences in Cardio-Metabolic Risk in Individuals with Undiagnosed Diabetes: National Health and Nutrition Examination Survey 1999-2008. J Gen Intern Med. 2012 Mar 14. [Epub ahead of print] PMC3403154
c. Axon RN, **Gebregziabher M**, Craig J, Zhang J, Mauldin P, Moran WP. Frequency and costs of hospital transfers for ambulatory care-sensitive conditions. Am J Manag Care. 2015 Jan;21(1):51-9. PMID:25880150
d. Lynch, C.P., **Gebregziabher, M**., Axon, R.N., Hunt, K.E., Payne, E., Egede, L.E. Geographic and Racial/Ethnic Variations in Patterns of Multimorbidity Burden in Patients with Type 2 Diabetes. Journal of General Internal Medicine. 08/2014.30(1). DOI: 10.1007/s11606-014-2990-y

Complete List of Published Work in PubMed:

http://www.ncbi.nlm.nih.gov/pubmed?cmd=DetailsSearch&term=gebregziabher,+mulugeta

D. Research Support

Ongoing Research Support:

VAMC HX001229 Axon (PI) 10/1/13 – 9/30/21

Health Equity and Rural Outreach Innovation Center (HEROIC)

This Center's mission is to improve access and equity in healthcare for all Veterans by eliminating geographic, racial/ethnic, and gender-based disparities. The Center's research focus includes: 1) health equity, 2) access to care, and 3) rural health. The goal of the Center is to promote innovative research, facilitate partnerships and collaboration across disciplines, and increase the impact of health services research on the health and health care of Veterans.

Role: Co-Investigator/Biostatistician

VA HSR&D Merit HX001442 Santa Ana (PI) 7/1/14 – 6/30/18

Group Motivational Interviewing (GMI) for Homeless Veterans in VA Services

The ultimate goal of this research is to establish the basis of a GMI dissemination and implementation course of action for highly vulnerable homeless Veterans in VA housing for achieving their greatest success in attaining housing stability.

Role: Co-Investigator/Biostatistician

MRSGT/MRSGM Tanner (PI) 06/01/15-05/31/20

Expanding the findings of the NLST trial to underrepresented groups

This mixed-methods study will target those patients at high-risk for LC as identified by the USPSTF recommendation. Through qualitative focus groups, a decision-aid tool will be evaluated and refined. The goals of the study are: (a) To develop a culturally-sensitive decision aid tool, and (b) To evaluate the impact of the tool in combination with individualized counseling on patient knowledge and degree of informed decision-making regarding lung cancer risk and screening.

Role: Biostatistician/Mentor

NIH R18 HS023754 Taber (PI) 09/01/2017 – 6/30/2020

***Improving Transplant Medication Safety through a Pharmacist-Led, mHealth-Based Program* (TRANSAFE Rx Study)**

This is a prospective, randomized, study that will test a mobile health and pharmacist intervention aimed at reducing medication safety events and improving clinical outcomes in kidney transplant recipients.

NIH/NIDCD P50 DC000422-26 Dubno (Prg Dir)/Mills (PI) 01/01/14 – 12/31/18

Experimental and Clinical Studies of Presbyacusis (Core B: Human Subjects Core)

Goal: The primary function of Core B is the collection, storage, and analysis of medical and audiologic information from human subjects, and the recruitment of human subjects into the research program.

Role: Co-Investigator

NIH/NINDS 5U01 NS079179-03 Owolabi and Ovbiagele (MPI) 05/01/12 – 04/30/18
Tailored Hospital-based Risk Reduction to Impede Vascular Events after Stroke (THRIVES)
Goals: The overall aim of the Tailored Hospital-based Risk Reduction to Impede Vascular Events after Stroke (THRIVES) study is to determine whether a culturally-sensitive multipronged post-discharge intervention can significantly reduce blood pressure, enhance achievement of guideline recommended targets for risk factor control, and lower recurrent vascular events in a LMIC (Nigeria)
Role: Co-Investigator

NIH-Fogarty R21 NTW010479 Ovbiagele (PI) 09/01/16 – 08/31/18
Evaluation of Vascular Event Risk on Long-term Antiretroviral Suppressive Treatment (EVERLAST)
Study to characterize presence of vascular risk among 240 HIV subjects on cART in Ghana (vs. 240 cART-naïve HIV patients and 240 HIV-uninfected subjects) and explore factors influencing it, while building sustainable capacity for a future intervention study.

NIH/NINDS 1R25NS098999-01 Ovbiagele (PI) 12/01/2016 – 11/30/21
Training in Research for Academic Neurologists to Sustain Careers and Enhance the Numbers of Diverse Scholars (TRANSCENDS)
The major goals of this project are to train and inspire diverse post-residency fellows and junior faculty to conduct high-quality neurological research and develop successful academic careers.
Role: Biostatistician/Mentor

5K23DK099440-03 Taber (PI) 04/01/14-01/31/19
NIH/NHLBI
Impact of Cardiovascular Risk Control on Racial Disparities in Kidney Transplant
The goals of this Mentored Patient-Oriented Research Career Development Award are to better understand the role of cardiovascular (CV) risk factor control on racial disparities in kidney transplantation.
Role: Biostatistician/Mentor

Completed Research Support (*past 3yrs)*
NIH/NHGRI/NINDS 1U54HG007479-01 Owolabi and Ovbiagele (MPI) 09/20/13 – 07/31/17
Stroke Investigative Research & Education Network (SIREN)
Goals: The aim of SIREN as a multidisciplinary collaborative research network of investigators in SSA and the United States is to determine whether a culturally sensitive, multi-pronged, post-discharge intervention can significantly reduce blood pressure, enhance achievement of guideline-recommended targets for risk factor control, and lower recurrent vascular events in low- and middle-income country (Nigeria).
Role: Co-Investigator
NIH/NIHCHD 1R01 HD069374-01A1 Eckert (PI) 05/01/12 – 04/30/17
Methods for Retrospective Multi-Site Research
The goal of the grant is to integrate data from existing studies to increase power through appropriate statistical pooling of data across samples.
Role: Co-Investigator
PPO 14-362 Tanner (PI) 4/1/2016 – 3/31/2017
VA HSR&D Pilot
Factors Influencing Veteran Informed Decision Making for Lung Cancer Screening
The objectives of this study are to: (a) assess the degree to which high-risk Veterans are making informed decisions regarding LC screening based on their beliefs and attitudes about LC screening; and (b) evaluate the association between these beliefs and attitudes and patient's perceptions about LC screening.
Role: Principal Investigator
VA HSR&D Merit HX001093 Axon (PI) 12/1/13- 11/30/17
Understanding Dual Use and Other Potential Determinants of Heart Failure Outcomes
This project aims to better understand heart failure outcomes. To do this, we will interview several groups of people including Veterans, their family members, VA, and non-VA healthcare providers and officials. We will ask questions about their preferences for heart failure care and how they make decisions.
Role: Co-Investigator/Biostatistician