ZHENKE WU

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EDUCATION

2014   **Johns Hopkins Bloomberg School of Public Health**, Baltimore, MD
Ph.D. in Biostatistics
Thesis title: *Statistical Methods for Individualized Health: Etiology, Diagnosis, and Intervention Evaluation*
Advisors: Scott Zeger and Constantine Frangakis

2009   **Fudan University**, Shanghai, China
B.Sc. in Mathematics

PROFESSIONAL EXPERIENCE

2016 - present   **Assistant Professor**
Department of Biostatistics, University of Michigan
Research Assistant Professor
Michigan Institute of Data Science (MIDAS), University of Michigan

2017 - present   **Faculty Associate**
Quantitative Methodology Program, Survey Research Center
Institute for Social Research (ISR), University of Michigan

2016 - present   **Consultant**
Biostatistics Core for Global Health (GLOBAL STATCORE), Office of Global Public Health, University of Michigan

2014 - 2016   **Postdoctoral Fellow**
Hopkins individualized Health (*in*Health), Johns Hopkins University
Department of Biostatistics, Johns Hopkins Bloomberg School of Public Health

2014 - 2016   **Co-lead Statistician**
Pneumonia Etiology Research for Child Health (PERCH) funded by Gates Foundation, International Vaccine Access Center (IVAC), Johns Hopkins Bloomberg School of Public Health
Principal Investigator: Katherine O'Brien

2015 August   **Visiting Scholar**
Combining Health Information, Computation and Statistics (CHICAS)
Lancaster University, Lancaster, England

2013 - 2014   **External Consultant**
Child Health Research Foundation (CHRF), Dhaka, Bangladesh; National Center for Immunization and Respiratory Diseases (NCIRD), The U.S. CDC

2010 - 2014   **Research Assistant**

International Vaccine Access Center (IVAC), Johns Hopkins Bloomberg School of Public Health
Advisor: Scott Zeger; *Principal Investigator*: Katherine O'Brien

2008 **Research Scholar**
California NanoSystems Institute, and Department of Mechanical and Aerospace Engineering, University of California, Los Angeles

2007 - 2009 **Research Scholar**
Center for Computational Systems Biology, Fudan University, Shanghai, China

PROFESSIONAL ACTIVITIES

Committee Member	Eastern North American Regional Meeting of the International Biometric Society, Educational Advisory Committee (March 25-28, 2018; Atlanta, GA)
Session Chair	*Towards a Learning-Health System: Methods and Strategies for Data-Driven Healthcare*, Joint Statistical Meetings (July 29 - August 3, 2017; Baltimore, MD)
Member	Cancer Epidemiology and Prevention (CEP) research program, Cancer Center Core Grant Member, University of Michigan Comprehensive Cancer Center (UMCCC)
	MIDAS mobile sensor analytics working group
	Hopkins inHealth (HiH) Learning Methodologies Working Group
Hosted Attendee	Methods Summit. PCORI Annual Meeting: Building a Patient-Centered Research Community. Arlington VA. October 6-8, 2015
Founding Committee Member	Chinese Public Health Forum (CPHF) at Johns Hopkins, 2010-12
Consultant	Studio Consultation, Johns Hopkins Institute for Clinical and Transnational Research (ICTR)
Referee	**Journals**: *Biometrics, Biostatistics, Journal of Business and Economic Statistics, Statistics in Medicine, Annals of Statistics, Ophthalmic Epidemiology, Computational Statistics and Data Analysis, Statistical Science, Sankhya (The Indian Journal of Statistics)*
	Grants: 2016 Johns Hopkins Individualized Health Initiative Request for Proposal (RFP); 2016 Methodology Research Grant, Medical Research Council, United Kingdom

HONORS AND AWARDS

UNIVERSITY OF MICHIGAN

2017 Travel Award for ENAR Junior Investigator Workshop, International Biometric Society. Washington, DC.

JOHNS HOPKINS UNIVERSITY

2016	New Researcher Conference Travel Award, Institute of Mathematical Statistics. Madison, WI.
2015	Top Performer for 2015 Prostate Cancer DREAM Challenge 1b; As part of *Bmore Dream Team*. Press Release.
2015	Scholarship for Summer Institute in Statistics and Modeling in Infectious Diseases. University of Washington, Seattle, WA
2015	NSF Big Data Travel award for Drawing Causal Inference from Big Data. National Academy of Sciences, Washington DC
2015	Induction into Alpha Chapter of *Delta Omega* Public Health Honor Society
2015	Induction into *Phi Beta Kappa* Honor Society
2014	First Place: Biostatistics Section of the Delta Omega Poster Competition
2012, 2013	Joseph Zeger Travel Award to ENAR and JSM
2012	June B. Culley Award, for outstanding achievement on school-wide oral exam paper
2011-14	Johns Hopkins Sommer Scholar
2009-14	Department of Biostatistics Graduate Fellowship

UNIVERSITY OF CALIFORNIA, LOS ANGELES

2008	UCLA-China Cross Disciplinary Scholarship in Science and Technology (CSST)

FUDAN UNIVERSITY

2009	B.Sc. with First Class Honors
2007-09	Chun-Tsung Scholar, Chinese Undergraduate Research Endowment (CURE) Scholarship
2008	First Class National Scholarship, Ministry of Education, China
2007	Excellent Undergraduate Student, Government of Shanghai
2006-07	First Class People's Scholarship
2006	First Class Shi Dai Scholarship

PUBLICATIONS   (†: alphabetical order)

JOURNAL ARTICLES (STATISTICAL METHODOLOGY)

Wu Z, Casciola-Rosen L, Shah AA, Rosen A, Zeger SL (2017+). Estimating AutoAntibody Signatures to Detect Autoimmune Disease Patient Subsets. http://www.biorxiv.org/content/early/2017/08/04/128199. *Biostatistics*. In press.

Wu Z, Deloria-Knoll M, and Zeger SL (2017). Nested Partially-Latent Class Models (npLCM) for Dependent Binary Data; Estimating Disease Etiology. *Biostatistics*, 18 (2): 200-213. doi:10.1093/biostatistics/kxw037.

Wu Z, Deloria-Knoll M, Hammitt LL, and Zeger SL, for the PERCH Core Team (2016). Partially Latent Class Models (pLCM) for Case-Control Studies of Childhood Pneumonia Etiology. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, 65: 97-114. doi: 10.1111/rssc.12101.

Bmore Dream Team: Deng D, Du Y, Ji Z, Rao K, **Wu Z**, Zhu Y, Coley RY (2016). Predicting Survival Time for Metastatic Castration-Resistant Prostate Cancer: An Iterative Imputation Approach. *F1000Research 2016, 5:2672*. doi: 10.12688/f1000research.8628.1.

Frangakis CE, Qian T, **Wu Z**, Diaz I (2015). Deductive Derivation and Turing-computerization of Semiparametric Efficient Estimation. *Biometrics*. doi:10.1111/biom.12362. Discussion paper.

Frangakis CE, Qian T, **Wu Z**, Diaz I (2015). Rejoinder: Deductive Derivation and Turing-computerization of Semiparametric Efficient Estimation. *Biometrics*. doi:10.1111/biom.12365.

Wu Z, Frangakis CE, Louis TA, Scharfstein DO (2014). Estimating Treatment Effects in Cluster Randomized Trials by Calibrating Covariate Imbalances between Clusters. *Biometrics*, 70: 1014-1022. doi: 10.1111/biom.12214.

JOURNAL ARTICLES (SUBSTANTIVE RESEARCH)

Deloria-Knoll M, Fu W, Shi Q, Prosperi C, **Wu Z**, Hammitt LL, Feikin DR, Baggett HC, Howie SRC, Scott JAG, Murdoch DR, Madhi SA, Thea DM, Brooks WA, Kotloff KL, Li M, Park DE, Lin W, Levine OS, O'Brien KL, Zeger SL (2017). Bayesian Estimation of Pneumonia Etiology: Epidemiologic Considerations and Applications to PERCH. *Clinical Infectious Diseases*; 64 (suppl 3): S213-S227. doi: 10.1093/cid/cix144.

Wu Z as part of the PERCH Study Group (2017). 14 articles in *Clinical Infectious Diseases*; 64 (suppl 3). Link to the complete list: https://goo.gl/3egRN1.

Guinney J et al. - **Wu Z** in PCC DREAM Consortium (2017). Prediction of Overall Survival for Patients with Metastatic Castration-Resistant Prostate Cancer: Development of A Prognostic Model Through A Crowdsourced Challenge with Open Clinical Trial Data. *The Lancet Oncology*, 18 (1): 132-142.

Georgiades C, Geschwind J-F, Neil H, Hines-Peralta A, Liapi E, Hong K, **Wu Z**, Kamel I, Frangakis CE (2012). Lack of response after initial chemoembolization for hepatocellular carcinoma: Does it predict failure of subsequent treatment? *Radiology*, 265:115-123.

UNDER REVIEW/REVISION

Fritsche L, Gruber SB, **Wu Z**, Chinnaiyan A, Schmidt E, Brummet C, Kheterpal S, Abecasis G, Mukherjee B (2017+). Association of Polygenic Risk Scores for Multiple Cancers in a Phenome-wide Study: Results from The Michigan Genomics Initiative.

IN PREPARATION

Wu Z, Xu G and Murphy SA (2017+). Statistics in mHealth/Just in Time Adaptive Intervention. Wiley StatsRef: Statistics Reference Online.

Wu Z and Zeger SL (2017+). Mixed Membership Regression Models for Estimating Autoimmune Disease Patient Subsets.

Wu Z, Dempsey W and Murphy SA (2017+). Dynamic Prediction to Individualize Mobile Interventions for Behavioral Maintenance.

Wu, Z and Zeger SL (2016+). **baker**: Bayesian Analytic Kit for Etiology Research.

Wu Z and Zeger SL (2016+). Bayesian Regression Analysis for Estimating Disease Etiology from Case-Control Data.

Wu Z and Zeger SL (2016+). Sparse Latent Class Regression for Multivariate Binary Data; A Bayesian Approach.

Wu Z and Zeger SL (2016+). Individualizing Health with Longitudinal Measurements and Feedback in Treatment Assignments

Wu Z, Ji HK, Leek JT, Colantuoni E (2016+). Evaluation of Peer-Review Grading in Biostatistics Courses Focused on Development of Data Analysis Skills.

Wu Z, with PERCH Study Group (2017+). Clinical and microbiological findings among young HIV-uninfected children with severe pneumonia from Africa and Asia: the Pneumonia Etiology Research for Child Health (PERCH) Case-Control Study. In preparation for *Lancet*.

Wu Z, with PERCH Study Group (2017+). Etiology of severe and very severe pneumonia in children from Africa and Asia: Integrated Analysis of the PERCH Case-Control Study. In preparation for *Lancet*.

SOFTWARE

baker:	Bayesian Analysis Kit for Etiology Research - Fitting and visualizing Bayesian nested partially-latent class models for estimating disease etiology
	https://github.com/zhenkewu/baker
mpcr:	Robust covariate-calibrated estimation of treatment effect in matched-pair cluster randomized trials.
	https://github.com/zhenkewu/mpcr
spotgear:	Subset Profiling and Organizing Tools for Gel Electrophoresis Autoradiography in R
	https://github.com/zhenkewu/spotgear

TEACHING AND ADVISING   (see website for materials; *upcoming)

MENTOR

2017 Summer   Big Data Summer Institute, NIH BD2K R25 (PI: Mukherjee)

Undergraduate Student Projects on Statistical Methods for **Electronic Health Records** (data: Michigan Genomics Initiative).

Department of Biostatistics, University of Michigan

INSTRUCTOR

2017 Fall   Statistical Methods in Epidemiology (BIOSTAT 523), Department of Biostatistics, University of Michigan.

2016 Fall   Statistical and Computational Methods for Learning through Graphical Models (Advanced Topics in Biostatistics; BIOSTAT 830), Department of Biostatistics, University of Michigan.

2014   Statistical Methods for Individualizing Health (Short course taught with Scott Zeger), Mayo Clinic, Department of Health Sciences Research, November 17, Rochester, MN.

GUEST LECTURER

2017   Network. Big Data Summer Institute, Department of Biostatistics, University of Michigan. June 22. Link: http://bigdatasummerinst.sph.umich.edu/wiki/index.php/Main_Page.

2016   Predicting Survival Time for Metastatic Castration Resistant Prostate Cancer: An Iterative Imputation Approach. Cancer Biostatistics Seminar Course (BIOSTAT 803), Department of Biostatistics, University of Michigan (Instructor: Jeremy M G Taylor). October 28.

2016   Data Visualization for Individualized Health via ggplot2. Public Health Studies, Undergraduate Seminar Course, Johns Hopkins University (taught by Yates Coley). March 1.

2016   Methods in Biostatistics (140.653; Master-level). Johns Hopkins University. February 11.

2015   A Survey of Automatic Bayesian Software and Why You Should Care. Hopkins Biostatistics Student Computing Club.

2015   Exploring the Posterior Distribution by Markov chain Monte Carlo. Hopkins Biostatistics Student Computing Club.

2014   Introduction to Empirical Processes and Semiparametric Inference. SLAM Working Group.

2012   Advanced Special Topics in Statistical Machine Learning, 140.840 (taught by Han Liu).

TEACHING ASSISTANT

2014   Multilevel Statistical Models, Graduate, 140.656 (taught by Elizabeth Colantuoni).

2014   Analysis of Longitudinal Data, Graduate, 140.655 (taught by Elizabeth Colantuoni).

2013   Biostatistics in Public Health, Undergraduate, 280.346 (taught by Scott Zeger).

2013   Case-based Introduction to Biostatistics, **www.coursera.org** (taught by Scott Zeger;$\sim 23,000$ global enrollments).

2013   Bayesian Methods **I-II**, Graduate, 140.762-763 (taught by Gary Rosner).

2012   Biostatistics in Public Health, Undergraduate, 280.346 (taught by Scott Zeger).

2011-12   Advanced Probability Theory **I-II**, Graduate, 550.620 - 621 (taught by James Fill).

2010-11   Essentials of Probability and Statistical Inference **I-IV**, Graduate, 140.646-649 (taught by Michael Rosenblum and Charles Rohde).

PRESENTATIONS   (*upcoming)

ORAL: INVITED

2017   Estimating AutoAntibody Signatures to Detect Autoimmune Disease Patient Subsets.
- International Biometric Society, Brazilian Regional Meeting. July 24 - July 28, 2017, Federal University of Lavras (UFLA), Lavras, MG, Brazil. **Conference Plenary Talk**.*
- Big Data Summer Institute, University of Michigan. July 10, 2017, Ann Arbor, MI.
- Interdisciplinary Group Seminar (IGS), Center for Statistical Genetics, University of Michigan. November 29, 2016, Ann Arbor, MI

2016   Statistical Methods for Individualized Health. Annual School of Public Health Excellence in Research Symposium, University of Michigan. November 11, Ann Arbor, MI.

2016   Bayesian Nested Partially-Latent Class Models for Dependent Binary Data; Estimating Disease Etiology.
- 9th International Conference of the ERCIM WG on Computational and Methodological Statistics. December 9-11, University of Seville, Spain.
- Department of Biostatistics, University of Michigan. February 25, Ann Arbor, MI.
- Department of Biostatistics, University of Massachusetts, Amherst. February 5, Amherst, MA.
- Biostatistics Research Branch, Division of Clinical Research, National Institute of Allergy and Infectious Diseases, NIH. February 1, Rockville, MD.

2016   Sparse Latent Class Regression for Multivariate Binary Data; A Bayesian Approach. Survival, Longitudinal and Multivariate Data Working Group. Department of Biostatistics, Johns Hopkins University. May 6, Baltimore, MD.

2015   Informative Bayes Models for Estimating Disease Etiology.
- Biostatistics Grand Rounds, Johns Hopkins Bloomberg School of Public Health. November 9, Baltimore, MD.
- CHICAS, Medical School, Lancaster University. August 17, Lancaster, England.
- Department of Biostatistics, Brown University. February 17, Providence, RI.

2014   Partially Latent Class Models (npLCM) for Case-Control Studies of Childhood Pneumonia Etiology. SLAM Working Group. December 12, Baltimore, MD.

2014   Partially Latent Class Models (npLCM) for Case-Control Studies of Childhood Pneumonia Etiology. Pneumonia Etiology Research for Child Health (PERCH) Executive Committee Meeting. December 2, London, England.

2013   Estimating Infectious Etiology from Hierarchical Dirichlet Process Perspective. Pneumonia Etiology Research for Child Health (PERCH) Executive Committee Meeting. December 2, London, England.

2013   Partially Latent Class Models (pLCM) for Case-Control Studies of Childhood Pneumonia Etiology. US Centers for Disease Control and Child Health Research Foundation: Aetiology of Neonatal Infection in South Asia (ANISA) Project Committee Meeting. November 10, San Diego, CA.

2012   Revealing and Addressing Existing Basic Inadequacies in the Use of Paired Cluster Randomized Trials. Department of Biostatistics. Johns Hopkins Biostatistics Causal Inference Working Group. December 6, Baltimore, MD.

ORAL: CONTRIBUTED

2017   Detecting Autoimmune Disease Subsets for Estimated Autoantibody Signatures. Eastern North American Regional meeting of the International Biometric Society. March 12-15, Washington, DC.

2016   Sparse Latent Class Regression for Multivariate Binary Data; A Bayesian Approach. Joint Statistical Meetings. July 31-August 4, Chicago, IL.

2016   Bayesian Regression Analysis for Estimating Disease Etiology. Eastern North American Regional meeting of the International Biometric Society. March 6-9, Austin, TX.

2015   Bayesian Nested-Partially Latent Class Models for Estimating Disease Etiology. Eastern North American Regional meeting of the International Biometric Society. March 15-18, Miami, FL.

2014   Nested Partially Latent Class Models (npLCM) for Case-Control Studies of Childhood Pneumonia Etiology. Joint Statistical Meetings. August 7, Boston, MA.

2014   Estimating Treatment Effects in Cluster Randomized Trials by Calibrating Covariate Imbalances between Clusters. Eastern North American Regional meeting of the International Biometric Society. March 18, Baltimore, MD.

2013   Estimating Treatment Effects in Cluster Randomized Trials by Calibrating Covariate Imbalances between Clusters. Joint Statistical Meeting. August 4, Montreal, QC, Canada.

POSTER

2016   Bayesian Nested-Partially Latent Class Models for Estimating Disease Etiology. 18th Meeting of New Researcher Conference in Statistics and Probability. July 28-30, University of Wisconsin, Madison.

2015   Bayesian Nested-Partially Latent Class Models for Estimating Disease Etiology. John W. Tukey 100th Birthday Celebration Conference. Center for Statistics and Machine Learning (CSML), Princeton University. September 18, Princeton, NJ.

2014   Estimating Childhood Pneumonia Episodes Attributable to Putative Pathogens from Indirect Measurements: Seasonality and Impact of HIV Infection. Delta Omega Scientific Poster Competition. Feburary 8, Baltimore, MD.

2013   Hierarchical Bayesian Model for Combining Information from Multiple Biological Samples with Measurement Errors: An Application to Children Pneumonia Etiology Study. Eastern North American Regional meeting of the International Biometric Society. March 12, Orlando, FL.

RESEARCH GRANT PARTICIPATION

Co-Investigator, MIDAS Challenge Awards (PI: Sen)   03/01/2017-02/28/2019
Identifying Real-Time Data Predictors of Stress and Depression Using Mobile Technology.
Funding for methodological research in the area of health sciences, Michigan Institute of Data Science (MIDAS), University of Michigan
Effort: 10 %. $521,051.

Co-investigator, PCORI ME-1408-20318 (PI: Zeger)   07/01/2015 - 06/31/2018
Bayesian Hierarchical Models for Design and Analysis of Studies to Individualize Healthcare.
Funding for Methodological Research, Patient-Centered Outcomes Research Institute.
Subcontract to UMich 17-PAF02898; Effort: 27%. $890,032.

Co-lead Statistician, Gates Foundation 305215 (PI: O'Brien)   09/01/2014-12/31/2017
Pneumonia Etiology Research for Child Health (PERCH).
Subcontract to UMich 17-PAF02901; Effort: 32%.

Investigator, Project Data Sphere, LLC (PDS) by AstraZeneca   10/01/2015-03/31/2016
Prostate Cancer DREAM Challenge Educational Program Award
$2307.69.

PENDING

2017   Subcontract PI, NIH RO1 (PIs: Casciola-Rosen and Shah; Hopkins)   04/01/2018 - 03/31/2023
        Autoantibodies Define Scleroderma Subgroups with Distinct Relationships to Cancer
2017   Co-I, NIH RO1 (PI: Sen; U of Michigan)   04/01/2018 - 03/31/2023
        Mobile Technology to Identify Mechanisms Linking Genetic Variation and Depression

ACADEMIC SERVICE

DEPARTMENT OF BIOSTATISTICS, UNIVERSITY OF MICHIGAN

2016 -   Admissions
2016 -   Seminars/Brown Bag

MICHIGAN INSTITUTE OF DATA SCIENCE

2016   Poster Competition Judge, Michigan Institute of Data Science Symposium, November 15