SARAH GABRIELLE AYTON

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EDUCATION	**Instituto Tecnológico y de Estudios Superiores de Monterrey, Monterrey, NL** *PhD Computer Science, Data Science & Applied Mathematics Concentration* Dissertation: Automatic Multi-Target Clinical Classification and Biomarker Discovery in Cancer	2019-2023

Columbia University Mailman School of Public Health, New York, NY
MPH Epidemiology, Certificate in Applied Biostatistics
2016-2018

- Master's Thesis: Assessing HIV & HSV risk predictors among South African females

University of Massachusetts Amherst, Commonwealth Honors College, Amherst, MA
BSc Psychology, Neuroscience Concentration
2013-2016

- Honor's Thesis: Dengue Virus and Dengue Hemorrhagic Fever – Forecasting a Growing Threat to Human Health

Stony Brook University
Summer in Tanzania – Study Abroad Research Program
2015

- Coursework: Cultural Anthropology, Anthropology of Medical Practices
- Research: Malaria in Tanzania – An Overview of Eradication Efforts and Obstacles

PROFESSIONAL EXPERIENCE

Columbia University Mailman School of Public Health, New York, NY
Instructor: Introduction to Biostatistical Methods, Department of Biostatistics
2018-Pres.

- Instruct and administer online biostatistics course of up to 75 students from a range of academic backgrounds, design and organize semester schedule, syllabus, and course materials, and create and administer the course web interface
- Hire and manage 2-4 teaching assistants each semester and held regular meetings regarding course progress, upcoming material and assignments, grading, and organized workshops to help students grasp use of R software and course content

Columbia University ICAP, New York, NY
PHIA Research Associate
2018-Pres.

- Design and conduct geospatial (ArcGIS, QGIS, GeoDa) and non-spatial (STATA, R) statistical analysis of data from CDC-ICAP Population-based HIV Impact Assessments (PHIAs) in sub-Saharan Africa PEPFAR-supported countries to define the status of the HIV epidemic
- Lead data analyst for two CDC-ICAP collaborative PHIA publications; designed research questions and statistical analysis plans, literature reviews and prepared manuscripts for projects focused on TB, AGYW, and AGYW partners

Clínicas del Azúcar, Diabetes Nudge Lab, Monterrey, NL, Mexico
Senior Statistician, Director of the Diabetes Nudge Lab
2019-Pres.

- Design and conduct statistical analyses of data from Clínicas del Azúcar to optimize care for diabetic patients at clinics, assess internal operations and efficiency, and design focus areas for lab research to better understand the diabetes epidemic
- Helped launch the Diabetes Nudge Lab, responsible for coordinating professional partnerships in research at Clínicas del Azúcar

Biem Inc., New York, NY
Public Health Research Fellow
2017-2018

- Design phase I public health research for the Biem mobile health application, maintain database, design and direct statistical analyses, organize inter-institutional cooperation and joint events to support safe sex and sexual health
- Grant application management coordination among investigators. Determined budget for 6 & 12-month lines of investigation. Designed and drafted introduction, technical discussion, analytical plan
  - **NSF: Small Business Research Innovation (SBIR) Grant**
  - **Robert Wood Johnson Foundation: Pioneering Ideas Grant**

Columbia University Mailman School of Public Health, New York, NY   2017-
Graduate Teaching Assistant, Department of Biostatistics   2018

- Courses: Applied Regression I (2017), Relational Databases & SQL Programming (2018)
- Assist with course instruction: hypothesis testing, probability, regression techniques, MS Access, VBA, SQL, MySQL, and database and query logic
- Provide administrative support for lectures, grade homework and quizzes, aid in exam construction, administration, and evaluation for lectures of 100+ students

University of Massachusetts Amherst, Amherst, MA   2014-
Research Assistant, GIS Lab   2016

- Studied spatial patterns of dengue, land use, and climate using data from Taiwan CDC, Central Weather Bureau, and literature extraction
- Estimated dengue hemorrhagic fever and dengue fever outbreaks with Poisson regression and examined time series occurrence (ArcGIS, R 3.4.1)

University of Massachusetts Amherst, Amherst, MA   2016
Undergraduate Teaching Assistant, Department of Psychology & Brain Sciences

- Course: Neuroendocrinology
- Assist with course materials and conducting lectures, aided test construction and correction, held weekly office hours and conducted exam review sessions

University of Massachusetts Amherst, Amherst, MA   2014-
Academic Tutor, Learning Resource Center   2015

- Provided supplementary instruction and academic support in Biology, Chemistry, Neuroscience, Calculus, Psychology, and French coursework

RESEARCH
EXPERIENCE

Columbia University Mailman School of Public Health, New York, NY   2017-
Graduate Research Assistant, Department of Epidemiology & CAPRISA   2018

- Evaluated sensitivity and specificity of HIV risk scoring tool among South African adolescent females with simulations and CAPRISA 007 clinical trial data (R 3.4.1)
- Assessed bivariate relationships between risk variables HIV and HSV-2 outcome status, ran exploratory and confirmatory factor analysis to assess relationships between predictors of HIV and HSV-2 acquisition (Mplus 7)
- Evaluated classes of risk among female adolescents with latent class analysis and polytomous logistic regression (Mplus 7, R 3.4.1)

CIDICS, Universidad Autónoma de Nuevo León, Monterrey, NL, Mexico   2017-
Zika Border Health Fellow, Unidad de Investigación en Salud Pública   2018

- Develop and assess KAP survey of vector-borne disease knowledge, attitudes, and practices in the Monterrey metropolitan population (Mplus 7)
- Assess multivariable relationships between sociodemographic and migration predictors and county-level Zika cases with econometric spatial analysis, Poisson regression, and geographically weighted regression (GeoDa, R 3.4.1, qGIS)
- Compare global niche projections using ensemble models and regional approach to better characterize spatial distribution of Zika in Mexico and the Americas using maximum entropy and random forests machine learning (R 3.4.1)

Vassar Brothers Medical Center & Crisis Response Journal, Poughkeepsie, NY   2016
Clinical Research Assistant

- Conducted literature reviews and developed manuscript content on recent technological advances in crisis response

University of Massachusetts Amherst, Amherst, MA   2015-
Research Assistant, Neuroendocrinology Lab   2016

- Programmed and decoded simulation software protocols; designed and implemented data collection spreadsheets for weight measurements and normalization; designed lab safety protocol for the wet lab; wrote research proposals

- Ran simulations with animals to measure variations in maternal behavior and motivation in learning; socially classified behavior outcomes of mothers

University of Massachusetts Amherst, Amherst, MA 2014-2015
Research Assistant, Social Psychology Lab
- Ran social psychology experiments, interpreted and coded data for further analysis; analyzed publications on mental health issues, bias, and aging

University of Massachusetts Amherst, Amherst, MA 2015
Research Assistant, Cognition and Action Lab
- Analyzed EEG data from nap studies, ran participant napping trials and applied EEG; presented preliminary health outcomes associated with napping

SKILLS & MEMBERSHIPS

Skills: R, Python, SAS, MPlus, STATA, SPSS, GIS (GeoDa, QGIS, ArcGIS), MS Suite, Access (SQL, MySQL, VBA), Adobe Photoshop
Languages: English (Native), Spanish (Advanced), French (Proficient)
Certifications: HIPAA (patient privacy), CITI (human subjects research)
Memberships: Society for Epidemiologic Researchers (SER), Red Temática Binacional en Salud Fronteriza

SCIENTIFIC PUBLICATIONS

Manuscripts

Ayton, S., Martinez-Ledesma, E., Tames, J., Pavlicova, M., Treviño, V. Multi-Omics Subtyping for Clinically Prognostic Cancer Subtypes and Personalized Therapy: A Systematic Review and Meta-Analysis. *Genetics in Medicine.* (2021). https://doi.org/10.1016/j.gim.2021.09.006 — 2021

Ayton, S., Schwitters, A., Mantell, J., Nuwagaba-Biribonwoha, H. Hakim, A. Hoffman, S. Biraro, S., Philip, N., Wiesner, L., Gummerson, E., Brown, K., Nyogea, D., Barradas, D., Nzima, M., Sachathep, K., Mnisi, Z., Fischer-Walker, C., Payne, D., Mulenga, L., Low, A. Male partner age, viral load, and HIV infection in adolescent girls and young women: Evidence from eight countries in sub-Saharan Africa. *The Lancet HIV.* (Under Review) — 2021

Solmo, C., Yuengling, K.A., Cooney, M., Sachathep, K., **Ayton, S.,** Kirungi, W., Rogers, J., Jonnalagadda, S., Payne, D., Low, A. Contraception and progress toward FP2020 goal in 11 Africa Countries. *Lancet Global Health.* (In Prep.) — 2021

Low, A., Gummerson, E., Schwitters A.M., Bonifacio, R., Teferi, M., Mutenda, N., **Ayton, S.,** Juma, J., Ahpoe, C., Ginindza, C., Patel, H., Biraro, S., Sachathep, K., Hakim, A., Barradas, D., Saandani Hassani, A., Kirungi, W., Jackson, K., Goeke, L., Philip, N.M., Mulenga, L., Ward, J., Hong, S., Rutherford, G.W., Findley, S. Food Insecurity and the Risk of HIV Acquisition: Findings From Six Sub-Saharan African Countries, 2015-2017. *Lancet Global Health.* (Under Review). — 2021

Ayton, S., Flores, K., Feng, Z., Arizpe, P., Salazar, R., Meza, O. Self-efficacy in type 2 diabetes management: psychometric property assessment and validation of the Spanish Diabetes Management Self-Efficacy Scale for Mexican patients (MX-DMSES). *Health and Quality of Life Outcomes.* (In Prep.) — 2021

Ayton, S., Pavlicova, M., Abdool Karim, Q. Identification of Adolescent Girls and Young Women for targeted HIV prevention: A new risk scoring tool in KwaZulu Natal, South Africa. *Scientific Reports.* **10,** 13017 (2020). https://doi.org/10.1038/s41598-020-69842-x — Aug. 2020

Ayton, S., Pavlicova, M., Tamir, H., Abdool Karim, Q. Development of a prognostic tool exploring female adolescent risk for HIV prevention and PrEP in rural South Africa, a generalized epidemic setting. *Sexually Transmitted Infections*. 2020; 96(1): 47-54. doi:10.1136/sextrans-2019-054067 — Feb. 2020

Ayton, S., Pavlicova, M., Tamir, H., Abdool Karim, Q. Assessing HIV & HSV risk predictors among South African females. Master's Thesis. May 5, 2018. — 2018

Ayton, S., Esteves, C., Portelli, I. R&D: Safe Surgery Innovation in Crisis. Crisis Response Journal edition 12:2. December 12, 2016. — 2016

Ayton, S., Esteves, C., Portelli, I. How Your Voice is Transforming Virtual Medicine, Crisis Response Journal. https://www.crisisresponse.com/comment/blogpost.php?post=300. October 5, 2016. — 2016

Ayton, S., Bradley, B. Dengue Hemorrhagic Fever and Dengue Virus: Forecasting a Growing Threat to Human Health. University of Massachusetts Amherst. Special Collections and University Archives: Theses and Dissertations. May 22, 2016. — 2016

Presentations, Abstracts, & Posters

Dierst-Davies, R., Godby Vail, S., **Ayton, S.,** Lidrbauch, G., Vargas, J., Andric, N., Harvey, E., Szwartz, G., Garza, M., Lozano, J.A., Arias, A., Sosa, P., Martinez, P., Reyes, J. A Mixed-Methods Approach Integrating Behavioral Insights and Data Analytics to Address Retention at Diabetes Clinics in Mexico: A Guide for Program Development. APHA 2019 Annual Meeting, November 2019. — 2019

Harvey, E., Andric, N., Dierst-Davies, R., Godby Vail, S., Szwartz, G., Arias, A., Coltin, K., Lozano, J.A., Garza, M., **Ayton, S.,** Lidrbauch, G., Reyes, J., Sosa, P., Martinez, P. Pathway Analysis for Care Adherence Modeling. APHA 2019 Annual Meeting, November 2019. — 2019

Ayton, S., Schwitters, A., Mantell, J., Hakim, A., Hoffman, S., Philip, N., Brown, K., Barradas, D., Payne, D., Low, A. Male partner age and HIV infection among young women in cohabitating partnerships in five countries in southern Africa. 10th IAS Conference on HIV Science (IAS 2019), July 2019. — 2019

Ayton, S., Cortés Hernandez, D., Picazzo Palencia, E. Using a novel spatial analysis to predict Zika distribution in the Mexico-U.S. border, 1947-2017. SER Meeting. June, 2018. — 2018

Ayton, S., Cortés Hernandez, D., Zika Virus: Assessing Mexico Border Health. CIDICS, Universidad Autónoma de Nuevo León, Mexico. CIDICS Speaker Series, 2017. — 2017

Ayton, S., Cortés Hernandez, D., Picazzo Palencia, E., Assessing Zika Along the U.S.-Mexico Border. Columbia University. Mailman School of Public Health: Epidemiology Masters Research Conference, 2017. — 2017

Ayton, S., Bradley, B., Dengue Hemorrhagic Fever and Dengue Virus: Forecasting a Growing Threat to Human Health. University of Massachusetts. Massachusetts Statewide Annual Research Conference, 2016. — 2016

GRANTS & AWARDS		
Full Tuition Grant for Doctoral Study in Engineering, ITESM	2019-2023
Doctoral Fellowship, Consejo Nacional de Ciencia y Tecnología (CONACYT)	2019-2023
Organization of the American States (OAS), Consejo Nacional de Ciencia y Tecnología (CONACYT), and Pan-American Health Organization (PAHO) Award for Postgraduate Study in Engineering, Science, and Health in Mexico	2019
Epidemiology Merit Award, Columbia University ($25,000 per year)	2016-2018
EPIC Fund Scholar, Department of Epidemiology, Columbia University ($500)	2018
Mailman School Scholars Fund Award, Columbia University ($5,000 per year)	2016-2017
College of Natural Sciences Dean's List, University of Massachusetts	2013-2016
Chancellor's Award, University of Massachusetts ($10,000 per year)	2013-2016
Commonwealth Honors Research Fellowship, University of Massachusetts ($550)	2016
Commonwealth Honors Research Grant, University of Massachusetts ($350)	2015
Evans Family Scholarship for Environmental Conservation, University of Massachusetts ($1,000)	2015
Otto Deneger Scholarship, University of Massachusetts ($1,735)	2015
Mass Society, University of Massachusetts ($650)	2015
Fonseca Scholarship, University of Massachusetts ($245)	2015