

María A. Valdez Cabrera

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Personal Profile

I am a PhD candidate in the Department of Biostatistics at the University of Washington. My research interests include the development of statistical methods for non-Euclidean data, semiparametric modeling and survival analysis.

My current dissertation project is focused on proposing a metric space for weighted tree-graphs with non-identical leaves, and developing statistical tools for the analysis of collections of these graphs. For this project, I am drawing on my skills in mathematics, algorithm design, and statistics.

Education

University of Washington

Seattle, Washington, USA

PhD Candidate, Biostatistics

September 2018 – Current

- Advisor: Amy Willis, Ph. D.
- Dissertation: Statistical methods for phylogenetic trees with non-identical leaf sets
- GPA: 3.71
- Expected graduation: March 2024

Universidad de Guanajuato

Guanajuato, México

Bachelor in Mathematics

August 2013 – June 2018

- Advisor: Eloísa Díaz-Francés, Ph. D.
- Thesis project: Proposal for the efficient estimation of a Binomial success rate and its extension to the comparison of two binomial distributions
- GPA: 3.78

Honors/Awards and Scholarships

XV Escuela de Probabilidad y Estadística

Guanajuato, México

Poster Contest

March 2017

Won the first place in the poster Contest of the XV Summer School of Probability and Statistics of CIMAT.

CIMAT (Center for Research in Mathematics)

Guanajuato, México

CIMAT scholarship

Sept 2020 - Aug 2021

- Scholarship for students who achieve and maintain a high GPA throughout their studies.

Work Experience

Statistical Diversity Lab

Seattle, Washington, USA

Research Assistant

June 2022 – current

- **Supervisor:** Amy Willis, Ph.D.
- Maintaining and improving software from the Statistical Diversity Lab such as:
 - **Breakaway:** R package to estimate and to model species richness and microbial diversity.
 - **Corncob:** R package that provides models for microbial abundances and tests for the effect of covariates on it.
 - **DivNet:** R package to estimate diversity in networked communities.
 - **Tinyvamp:** R package for estimation and removal of measurement error in high-throughput sequencing data.
- Assisting with methods development
 - Analysis of phylogenetic trees with different leaf sets.
 - Algorithm design for the comparison of subsets in the BHV tree space.

Fred Hutchinson Cancer Research Center

Seattle, Washington, USA

Research Assistant

April 2019 – June 2022

- **Supervisor:** Elizabeth Brown, Ph.D.
- Collaboratively developed and executed a statistical plan to explore the prevalence and incidence rate of various Sexually Transmitted Infections among young women in Africa enrolled in a HIV prevention trial under Microbicide Trials Network (MTN).
- Analyzed factors correlated with the willingness to use a Dapivirine ring (a novel HIV prevention method) among women participating in an open label HIV prevention trial.
- Results and manuscript preparation.

Fred Hutchinson Cancer Research Center

Seattle, Washington, USA

Research collaborator

January 2019 – April 2019

- **Supervisor:** Ruth Etzioni, Ph.D.
- Produced a report on the theoretical capacity of a biomarker to predict a positive result using a gold standard test in the near future based on the sensitivity and specificity of both the biomarker and the gold standard test.
- Performed a simulation study to assess the possibility of using a biomarker to predict which subjects should get tested by the gold standard in the near future.

CIMAT (Center for Research in Mathematics)

Guanajuato, México

Research Assistant

January 2018 – May 2018

- **Supervisor:** Víctor Pérez-Abreu, Ph.D.
- Explored the application of Topological Data Analysis into graph theory.

CIMAT (Center for Research in Mathematics)

Guanajuato, México

Research Assistant

August 2015 – December 2016

- **Supervisor:** Eloísa Díaz-Francés, Ph.D.
- Improved the use of binomial likelihoods in proportions estimation on clinical trials. We conducted a review on the most common methods used for the construction of confidence intervals and proposed a new method with an improved coverage.

Teaching Experience

Teaching Assistant

University of Washington

BIOST 571: Advanced Regression Methods for Dependent Data

January 2023 – March 2023

BIOST 537: Survival Data Analysis In Epidemiology

January 2022 – March 2022

– Conducted discussion sections

BIOST 513: Medical Biometry III

March 2021 – June 2021

– Conducted discussion sections

BIOST 512: Medical Biometry II

January 2021 – March 2021

BIOST 536: Categorical Data Analysis in Epidemiology

September 2020 – December 2020

BIOST 523: Statistical Inference For Biometry II

January 2020 – March 2020

BIOST 512: Medical Biometry II

January 2019 – March 2019

BIOST 511: Medical Biometry I

September 2018 - December 2018

Teaching Assistant

Universidad de Guanajuato

M24101: Statistical Methods

January 2016 – June 2016

– Conducted lectures and review sessions

Publications

1. Mirembe, B. G., **Valdez Cabrera, M.**, van der Straten, A., Nakalega, R., Cobbing, M., Mgodhi, N. M., Palanee-Phillips, T., Mayo, A. J., Dadabhai, S., Mansoor, L. E., Siva, S., Nair, G., Chinula, L., Akello, C. A., Nakabiito, C., Soto-Torres, L. E., Baeten, J. M., & Brown, E. R. (2022). *Correlates of Dapivirine Vaginal Ring Acceptance among Women Participating in an Open Label Extension Trial*. *AIDS and Behavior*. <https://doi.org/10.1007/s10461-022-03841-z>
2. Urquidez, O., & **Valdez, M.** (2019). *Diseño de grafos pesados con n-ciclos persistentes*. *Morfismos*, Vol. 23 No.1

Conferences and Workshops

INVITED PRESENTATIONS

1. **Valdez Cabrera, M.** & Willis, A. Developing statistical methods to compare Phylogenetic Trees with non-identical leaf sets. Presented at: WNAR 2023 Annual Meeting; June 2023; Anchorage, AK, USA.
2. **Valdez Cabrera, M.** & Willis, A. Statistical methods to analyze phylogenetic trees with non-identical leaf sets. Presented at: 6th International Conference on Econometrics and Statistics; July 2023; Tokyo, Japan.
3. **Valdez Cabrera, M.** Esqueleto de Homología Persistente como descriptor del borde de objetos en una imagen (Homologically Persistent Skeleton for describing the border of objects in an Image). Presented at: Noveno Verano de Probabilidad y Estadística en el CIMAT; June 2016; Guanajuato, México.

POSTER PRESENTATIONS

1. Gati Mirembe, B., **Valdez Cabrera, M.**, Cobbing, M., ..., Brown, E. Correlates of Dapivirine vaginal ring uptake among women participating in an open label extension trial-MTN-025/HOPE. Poster presented at: HIV R4P; January 2021; Virtual.
2. **Valdez Cabrera, M.** & Díaz-Francés, E. Propuesta de estimación de una proporción Binomial con intervalos de verosimilitud de nivel adecuado (Proposal for the estimation of a Binomial proportion with appropriate level likelihood intervals). Poster presented at: XV Escuela de Probabilidad y Estadística en el CIMAT; March 2017; Guanajuato, México.

WORKSHOPS AND CONFERENCE PARTICIPATION

1. Object Oriented Data Analysis in Health Sciences Workshop; July 2023; Chicago, IL, USA.
2. 2019 Women in Statistics and Data Science (WSDS) Conference; October 2019; Bellevue, WA, USA.
3. III School of Topological Data Analysis and Stochastic Topology; January 2017; Toluca, Mexico.

Extracurricular Activities

Biostatistics Student Seminar Organizer

September 2019 – December 2022

Activities included the planning of useful sessions for students and the recruitment of presenters each quarter, keeping assistance for enrolled students for proper accreditation and making public announcements for each session.

Organizational Committee of National Elementary and Middle School Mathematical Olympiads program (ONMAPS)

January 2015 – June 2018

Member of the Organizational Committee of National Elementary and Middle School Mathematical Olympiads program (ONMAPS) for the state of Guanajuato. Activities included designing, applying and grading selection tests, training the selected students and giving workshops to teachers of different schools.

Mathematics Educational Extension department

January 2014 – December 2014

Volunteer at the Mathematics Educational Extension department of CIMAT (Matemorfofis). As part of this team I gave workshops of interactive mathematics to kids along the state of Guanajuato.

Technical skills

Programming	R, C/C++, Python, JavaScript
R packages	devtools, dplyr, ggplot2, lme4, msm, shiny, tidyverse
Miscellaneous	Shell (Bash), \LaTeX (Overleaf/R Markdown), Git, SQL

References available upon request.