

Juliana C. Taube

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Education

Georgetown University

PHD IN BIOLOGY

Advisor: Shweta Bansal, PhD

Washington, DC

2023 - present

Bowdoin College

A.B. *summa cum laude* WITH HONORS IN MATHEMATICS, MINOR IN BIOLOGY

Undergraduate thesis: Modeling coupled disease-behavior dynamics of SARS-CoV-2 using influence networks

Advisors: Mary Lou Zeeman, PhD (Mathematics) and Mohammad Irfan, PhD (Computer Science, Digital & Computational Studies)

Relevant coursework: Linear Algebra, Probability, Statistics, Bayesian Statistics, ODEs, PDEs, Data Structures, Social & Economic Networks, Evolution, Ecology, Microbiology, Genetics & Molecular Biology, Science Communication

Brunswick, ME

2017 - 2021

Research Experience

Georgetown University

RESEARCH ASSOCIATE, ADVISOR: SHWETA BANSAL, PHD

Washington, DC

Aug. 2021 - present

- Analyzed spatiotemporal trends in self-reported mask-wearing behavior during the U.S. COVID-19 pandemic
- Mapped the immune landscape of orthopoxviruses at a fine spatial resolution using demographic and vaccination data
- Describing spatiotemporal trends in self-reported non-household contacts
- Identifying gender and race/ethnicity imbalances in publications and citation practices within the field of infectious disease dynamics

Bowdoin College

STUDENT RESEARCHER, ADVISORS: MARY LOU ZEEMAN, PHD; MOHAMMAD IRFAN, PHD

Remote

May 2021 - present

- Continued honors thesis work in preparation for publication, specifically:
 - Adapted model to account for both global and local risk perception
 - Modified underlying network structure to better resemble real-world contact networks
 - Analyzed the role and interaction of risk perception and social influence terms in our model

Centers for Disease Control and Prevention, Division of Global Migration & Quarantine, Office of Innovation, Development, Evaluation, and Analytics

Remote

INTERN, ADVISORS: ARDATH GRILLS, PHD; SARAH BOWDEN, PHD; MICHAEL JOHANSSON, PHD

May - Aug. 2020

- Gathered, cleaned, and wrangled census and meat-packing location data for boosted regression tree machine learning model to predict and characterize COVID-19 county hotspots
- Collected data (attendance, venue size, event duration) for large gatherings considered COVID-19 superspreader events & investigated correlations between event aspects and disease transmission, in an effort to estimate dispersion parameter
- Contributed to model implementation and assessment of interventions to mitigate COVID-19 spread on cruise ships

University of Georgia, Odum School of Ecology

Athens, GA

STUDENT RESEARCHER (REU), ADVISORS: JOHN M. DRAKE, PHD; PAIGE B. MILLER, PHD

May - July 2019

- Compiled and standardized infectious disease transmission trees from the literature into an R database
- Analyzed predictors of outbreak size & quantified the contribution of superspreading to onward transmission
- Tested theory relating frequency of superspreading events and the dispersion parameter











STUDENT RESEARCHER (REMOTE), ADVISORS: JOHN M. DRAKE, PHD; PAIGE B. MILLER, PHD

June - Dec. 2020

- Expanded database to include COVID-19 transmission trees and released data online at outbreaktrees.ecology.uga.edu
- Further explored frequency, timing, and generation of superspreaders for COVID-19 relative to other diseases using database

- Assisted with development of Gates Foundation funding proposal: Applying the Lessons Learned from Polio Eradication
- Compiled and summarized literature on smallpox and polio eradication efforts, highlighting similarities and differences
- Organized data on bronchiolitis and RSV hospitalizations in New England

Publications

4. **Taube JC**, Susswein Z, Bansal S (2023) Spatiotemporal trends in self-reported mask-wearing behavior in the United States: Analysis of a large cross-sectional survey. *JMIR Public Health and Surveillance* 9: e42128. doi: 10.2196/42128   
3. **Taube JC***, Rest EC*, Lloyd-Smith JO, Bansal S (2022) The global landscape of smallpox vaccination history and implications for current and future orthopoxvirus susceptibility: a modelling study. *The Lancet Infectious Diseases*. 23(4): 454-462. doi: 10.1016/S1473-3099(22)00664-8.   
2. **Taube JC**, Miller PB, Drake JM (2022) An open-access database of infectious disease transmission trees to explore superspreader epidemiology. *PLoS Biology* 20(6): e3001685. doi: 10.1371/journal.pbio.3001685.   
1. Wright PF, Hoen AG, Jarvis JD, Zens MS, Dade EF, Karagas MR, **Taube JC**, Brickley EB (2022) Bronchiolitis hospitalizations in northern New England: Clues to disease prevention. *Therapeutic Advances in Infectious Disease* 9: 1-11. doi: 10.1177/20499361221099447  

* Authors contributed equally

Preprints & In Prep

2. **Taube JC**, Susswein Z, Bansal S (2023) Characterizing spatiotemporal trends in self-reported non-household contacts during the COVID-19 pandemic in the United States. *In preparation*.
1. **Taube JC**, Irfan MT, Zeeman ML (2023) Modeling coupled disease-behavior dynamics using influence networks and varying risk perception. *In preparation*.

Presentations

Characterizing heterogeneities in contact patterns

Poster at EEID 2023 

May 2023

State College, PA

Characterizing spatiotemporal trends in self-reported mask-wearing behavior in the U.S.

Talk at MIDAS Meeting 2022, 10 minutes + 25 minute breakout discussion 

Sept. 2022

Bethesda, MD

Modeling coupled disease-behavior dynamics of SARS-CoV-2 using influence networks

Invited talk for Prof. Mohammad Irfan's Research Group at Bowdoin College, 30 minutes

Oct. 2021

Virtual

An open-access database of infectious disease transmission trees to explore superspreader epidemiology

Rapid Fire Talk at MIDAS Meeting 2021 

May 2021

Virtual

Who infected whom? Creating a database of transmission trees for comparative outbreak analysis

Poster at Epidemics 7 

Dec. 2019

Charleston, SC

Awards & Honors

2023	\$111,000	NSF Graduate Research Fellow
2021	\$1,920	Student Faculty Research Grant Fellowship for summer research funding
2020		Almon Goodwin Prize for exemplary members of Phi Beta Kappa
2020		Phi Beta Kappa
2020		Sarah and James Bowdoin Scholar & Book Award Winner (4x), Book Award is for 4.0 GPA
2020	\$5,000	Bowdoin Funded Internship Grant for internship with CDC
2019	\$2,000	REU Travel Grant for Epidemics 7 from Rocky Mountain Biological Laboratory
2019		Bowdoin College Goldwater Scholarship Nominee
2018		First Year Chemistry Award for outstanding promise and achievement in chemistry
2017	\$3,000	Bowdoin Faculty Scholar for excellence in high school courses
2017	\$4,000	Bowdoin National Merit Scholarship

Teaching Experience

Georgetown University

Washington, DC

BIOLOGY TEACHING FELLOW

Aug. - Dec. 2022, 2023

- Modeling Populations and Diseases (BIOL 422/GLID 522): attend lecture, lead lab section, hold weekly office hours, grade student labs, homeworks, & papers

Bowdoin College

Brunswick, ME

MATHEMATICS TEACHING ASSISTANT

Feb. - May 2021

- Partial Differential Equations (MATH 3209): created videos to explain homework solutions or review confusing concepts

DIGITAL AND COMPUTATIONAL STUDIES TEACHING ASSISTANT

Jan. - May 2021

- Contagion (DCS 3350): curated resources and assisted students
- Searched for flight, mobility, population, and contact tracing data sources, summarized findings for student project
- Collected and organized news articles on racism, economic impacts, and misinformation during the COVID-19 pandemic
- Led weekly study group to help students with their coursework using networkx

COMPUTER SCIENCE TEACHING ASSISTANT

Jan. 2019 - Dec. 2020

- Led weekly two-hour study groups to assist students with their assignments, including asking probing questions, finding the bugs in their code, and explaining concepts from class
 - Introduction to Computer Science (CSCI 1101): Jan. 2019 – Dec. 2020
 - Social and Economic Networks (CSCI/DCS 2350): Sept. – Dec. 2020

Service

MIDAS Student Committee

Jan. 2023 - present

virtual

- Plan and facilitate student events for the MIDAS (Models of Infectious Disease Agent Study) Network, including lightning talks and panels on starting a PhD program (moderator) and PhD work/life balance

Bowdoin Curriculum Implementation Committee Alternate Member

Aug. 2020 - May 2021

Brunswick, ME

- Attended committee meetings to provide student perspective on course proposals, including how they fit into the Bowdoin curriculum, and whether they satisfied distribution requirements

Bowdoin Student-Athlete Advisory Committee Member

Aug. 2020 - May 2021

Brunswick, ME

- Representative from Bowdoin's Women's Varsity Ice Hockey Team, advocated for team needs and worked with college administration to implement NCAA and NESCAC initiatives

Training

Studying Identity, Diversity, and Equity in Science

Washington, DC

GEORGETOWN UNIVERSITY

Summer 2023

Discuss identity in science from a variety of disciplines to identify how my research can contribute to a more equitable society

Teaching, Learning & Innovation Summer Institute

GEORGETOWN UNIVERSITY

Workshops on universal design, assessments in STEM courses, use of office hours, and science communication

Washington, DC

May 2022

Exploring Racial Justice: An Intragroup Dialogue for White Identified Students

BOWDOIN COLLEGE

Six-week workshop exploring social justice issues and white privilege without burdening students of marginalized identities

Virtual

April - May 2021

Summer Institute in Biostatistics

UNIVERSITY OF MINNESOTA

Coursework: Six weeks of classes in biostatistics, epidemiology, and statistical computing using R and SAS

Final project: Outlined clinical trial protocol of canakinumab in HIV+ patients

Minneapolis, MN

June - July 2018

Skills

Programming R, Python, Mathematica

Software LaTeX, Git, MacOS, Microsoft Office