Juliana C. Taube

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Education

Georgetown University *Washington, DC*
PhD in Biology *2023 - present*
Advisor: Shweta Bansal, PhD

Bowdoin College *Brunswick, ME*
A.B. *summa cum laude* with Honors in Mathematics, minor in Biology *2017 - 2021*
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

Research Experience

Georgetown University *Washington, DC*
Research Associate, Advisor: Shweta Bansal, PhD *Aug. 2021 - Aug. 2023*

- 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

Graduate Student Researcher *Aug. 2023 - present*

- Describing spatiotemporal trends in self-reported non-household contacts
- Identifying gender & race/ethnicity imbalances in citation practices in the field of infectious disease dynamics

Bowdoin College *Remote*
Student Researcher, Advisors: Mary Lou Zeeman, PhD; Mohammad Irfan, PhD *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) *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

Dartmouth Hitchcock Medical Center *Lebanon, NH*
INTERN, ADVISOR: PETER F. WRIGHT, MD *June - Aug. 2017*
- 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 *May 2023*
Poster at EEID 2023 📄 *State College, PA*

Characterizing spatiotemporal trends in self-reported mask-wearing behavior in the U.S. *Sept. 2022*
Talk at MIDAS Meeting 2022, 10 minutes + 25 minute breakout discussion 📄 *Bethesda, MD*

Modeling coupled disease-behavior dynamics of SARS-CoV-2 using influence networks *Oct. 2021*
Invited talk for Prof. Mohammad Irfan's Research Group at Bowdoin College, 30 minutes *Virtual*

An open-access database of infectious disease transmission trees to explore superspreader epidemiology *May 2021*
Rapid Fire Talk at MIDAS Meeting 2021 📄 *Virtual*

Who infected whom? Creating a database of transmission trees for comparative outbreak analysis *Dec. 2019*
Poster at Epidemics 7 📄 *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*
- 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 *virtual*

Bowdoin Curriculum Implementation Committee Alternate Member *Aug. 2020 - May 2021*
- Attended committee meetings to provide student perspective on course proposals, including how they fit into the Bowdoin curriculum, and whether they satisfied distribution requirements *Brunswick, ME*

Bowdoin Student-Athlete Advisory Committee Member *Aug. 2020 - May 2021*
- 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 *Brunswick, ME*

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   *Washington, DC*
GEORGETOWN UNIVERSITY   *May 2022*
Workshops on universal design, assessments in STEM courses, use of office hours, and science communication

Exploring Racial Justice: An Intragroup Dialogue for White Identified Students   *Virtual*
BOWDOIN COLLEGE   *April - May 2021*
Six-week workshop exploring social justice issues and white privilege without burdening students of marginalized identities

Summer Institute in Biostatistics   *Minneapolis, MN*
UNIVERSITY OF MINNESOTA   *June - July 2018*
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

Skills

Programming   R, Python, Mathematica
Software   LaTeX, Git, MacOS, Microsoft Office