**MATT HITCHINGS**

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**EDUCATION**

**Harvard T.H. Chan School of Public Health (HSPH)** Sep 2014 – Nov 2018

* Doctor of Science in Epidemiology, minors in infectious disease epidemiology and biostatistics.
* Thesis focusing on mathematical modeling of vaccine trials during epidemics

**University of Oxford, Jesus College** Oct 2011 – Sep 2012

* MSc in Mathematical Modeling & Scientific Computing. *Graduated with Distinction, placed 2nd in year.*

**University of Oxford, Mansfield College** Oct 2008 – Jul 2011

* Bachelor of Arts in Mathematics. *Graduated with First Class Honors, placed 8th in year.*

**WORK EXPERIENCE**

**Department of Biostatistics, University of Florida** July 2021 – Present

***Assistant Professor***

* Developing models for antibody dynamics in response to infection and vaccination, and conducting observational studies of vaccine effectiveness.

**Department of Biology, University of Florida** Nov 2018 – July 2021

***Postdoctoral Research Associate (Supervisor: Derek Cummings)***

* Work focusing on mathematical modeling of infectious diseases to aid design of randomized clinical trials for interventions to control disease, including dengue fever.
* Collaboration with Doctors Without Borders (MSF) Epicentre on design of Johnson & Johnson Ebola vaccine trial in DRC.
* Work in response to the COVID-19 pandemic including design and conduct of vaccine effectiveness studies in multiple states of Brazil and the Yale health system in Connecticut, estimates of the impact of non-pharmaceutical interventions, and utility and interpretation of test positive proportions.

**Dengue Branch, US Centers for Disease Control and Prevention** Apr 2019 – Present

***Visiting Scientist (Collaborators: Gabriela Paz-Bailey and Michael Johansson)***

* Aiding with design of randomized controlled trial of deployment of Wolbachia-infected mosquitoes in Ponce, Puerto Rico, and interpretation of arbovirus serosurveys and surveillance data.

**HSPH and Doctors Without Borders (MSF) Epicentre** Sep 2017 – Jan 2020

***Study Statistician (Supervisor: Sheila Isanaka)***

* Working on randomized controlled trial of reduced follow-up intervention for treatment of severe acute malnutrition in Nigeria. Roles will include designing and implementing a statistical analysis plan, working with a data manager to ensure data is appropriately recorded, and writing results for publication.

**Epidemiology Department, Doctors Without Borders (MSF) Epicentre** May 2015 – Nov 2018

***Research Intern (Supervisor: Rebecca Grais)***

* Projects included: building a model to simulate an Ebola vaccine trial to determine optimal sample size; using SAS to analyse the relationship between wasting and stunting among malnourished children; and acting as study statistician for randomized controlled trial of prophylactic antibiotic use during a meningitis epidemic in Niger (carried out in 2017).

**SKILLS**

* **Relevant Skills:** Microsoft Office. R, SAS, Stata, Matlab, VB, Perl, and Python.

**PUBLICATIONS**

* **MDT Hitchings\***, BA Borgert\*, A Shir, B Yang, et al. Dynamics of anti-influenza mucosal IgA over a season in a cohort of individuals living or working in a long-term care facility. Journal of Infectious Diseases, jiad029, 2023. (\* equal contribution)
* TM Quandelacy\*, **MDT Hitchings**\*, J Lessler, JM Read, et al. Household transmission dynamics of seasonal human coronaviruses. Journal of Infectious Diseases, jiac436, 2022.
* ML Lind, R Copin, S McCarthy, A Coppi, …, **MDT Hitchings**. Use of whole genome sequencing to estimate the contribution of immune evasion and waning immunity to decreasing COVID-19 vaccine effectiveness during alpha and delta variant waves. Journal of Infectious Diseases, jiac453, 2022.
* **MDT Hitchings**, EU Patel, R Khan, AK Srikrishnan, et al. A mixture model to estimate SARS-CoV-2 seroprevalence in Chennai, India (Accepted, American Journal of Epidemiology).
* M Lind, AJ Robertson, …, **MDT Hitchings**\* and WL Schulz\*. Effectiveness of Primary and Booster COVID-19 mRNA Vaccination against Infection Caused by the SARS-CoV-2 Omicron Variant in People with a Prior SARS-CoV-2 Infection. PLoS Medicine, 19(12):e1004136, 2022.
* **MDT Hitchings**, OT Ranzani, ML Lind, M Dorion, et al. Change in COVID-19 risk over time following vaccination with CoronaVac: A test-negative case-control study. BMJ, 377:e070102, 2022.
* **MDT Hitchings**, F Berthé, P Aruna, et al. Effectiveness of a monthly schedule of follow-up for the treatment of uncomplicated severe acute malnutrition in Sokoto, Nigeria: A cluster randomized crossover trial. PloS Medicine. 19(3), e1003923, 2022.
* **MDT Hitchings**, JA Lewnard, NE Dean, AI Ko, OT Ranzani, JR Andrews, DAT Cummings. Use of recently vaccinated individuals to detect bias in test-negative case-control studies of COVID-19 vaccine effectiveness. Epidemiology. 33(4), 450-456, 2022.
* **MDT Hitchings\***, OT Ranzani\*, M Dorion, et al. Effectiveness of ChAdOx1 vaccine in older adults during SARS-CoV-2 Gamma variant circulation in São Paulo. Nature Communications. 12(1):1-8, 2021.
* OT Ranzani\*, **MDT Hitchings\***, M Dorion, et al. Effectiveness of the CoronaVac vaccine in the elderly population during a Gamma variant-associated epidemic of COVID-19 in Brazil: A test-negative case-control study. BMJ, 374:n2015, 2021.
* **MDT Hitchings\***, OT Ranzani\*, MSS Torres, SB de Oliveira, et al. Effectiveness of CoronaVac among healthcare workers in the setting of high SARS-CoV-2 Gamma variant transmission in Manaus, Brazil: A test-negative case-control study. Lancet Regional Health Americas, 1: e100025, 2021.
* **MDT Hitchings**, NE Dean, B Garcia-Carreras, TJ Hladish, AT Huang, B Yang, and DAT Cummings. The Usefuless of SARS-CoV-2 Test-Positive Proportion As A Surveillance Tool. American Journal of Epidemiology, <https://doi.org/10.1093/aje/kwab023>, 2021.
* **MDT Hitchings**, DAT Cummings, RF Grais, S Isanaka. A mixture model to assess the immunogenicity of an oral rotavirus vaccine among healthy infants in Niger. Vaccine, 38(51): 8161-8166, 2020.
* AT Huang\*, B Garcia-Carreras\*, **MDT Hitchings\***, B Yang\*, et al. A systematic review of antibody mediated immunity to coronaviruses: kinetics, correlates of protection, and association with severity. Nature Communications. 11(1):1-16, 2020.
* **MDT Hitchings**, ME Coldiron, RF Grais, M Lipsitch. Analysis of a meningococcal meningitis outbreak in Niger – potential effectiveness of reactive prophylaxis. PLoS Neglected Tropical Diseases, 13(3): e0007077, 2019.
* **MDT Hitchings**, M Lipsitch, R Wang, and SE Bellan. Competing effects of indirect protection and clustering on the power of cluster-randomized controlled vaccine trials. American Journal of Epidemiology, <https://doi.org/10.1093/aje/kwy047>, 2018.
* **MDT Hitchings**, RF Grais, and M Lipsitch. Using simulation to aid trial design: Ring-vaccination trials. PLoS Neglected Tropical Diseases, 11(3):e0005470, 2017.
* B García-Carreras, **MDT Hitchings**, MA Johansson, M Biggerstaff, et al. Accounting for assay performance when estimating the temporal dynamics in SARS-CoV-2 seroprevalence in the US. Nature Communications, 14(1), 2235, 2023.
* NA Menzies, F Berthé, **MDT Hitchings**, et al. Cost-effectiveness of monthly follow-up for the treatment of uncomplicated severe acute malnutrition: an economic evaluation alongside a randomized controlled trial. PLoS Global Public Health, 2(12):e0001189, 2022.
* OT Ranzani, **MDT Hitchings**, et al. Effectiveness of an Inactivated Covid-19 Vaccine with Homologous and Heterologous Boosters against the Omicron (B.1.1.529) Variant in Brazil: a test-negative case-control study. Nature Communications, 13:5536, 2022.
* MO Fofana, N Nery Jr., JP Aguilar Ticona, EMMA Belitardo, …, **MDT Hitchings**, et al.Structural factors contributing to SARS-CoV-2 infection risk in the urban slum setting. PLoS Medicine, 19(9):e1004093, 2022.
* T Cerqueira-Silva, JR Andrews, VS Boaventura, OT Ranzani, V de Araújo Oliveira, ES Paixão, J Bertoldo, TM Machado, **MDT Hitchings**, et al. Effectiveness of CoronaVac, ChAdOx1, BNT162b2 and Ad26.COV2.S among individuals with prior SARS-CoV-2 infection in Brazil. Lancet Infectious Diseases, 22(6): 791-801, 2022.
* MH Collins, G Potter, **MDT Hitchings**, E Butler, M Wiles, et al. EVITA Dengue: A cluster-randomized controlled trial to EValuate the efficacy of Wolbachia-Infected *Aedes aegypti* mosquitoes in reducing the incidence of Arboviral infection in Brazil. Trials, 23(1): 1-18.
* NE Dean, AP y Piontti, ZJ Madewell, DAT Cummings, **MDT Hitchings**, et al. Ensemble forecast modeling for the design of COVID-19 vaccine efficacy trials. Vaccine, 38(46), 7213-7216, 2020.
* DAT Cummings, LJ Radonovich, GJ Gorse, CA Gaydos, MT Bessesen, AC Brown, CL Gilbert, **MDT Hitchings**, et al. Risk factors for healthcare personnel infection with endemic coronaviruses (HKU1, OC43, NL63, 229E): results from the respiratory protection effectiveness clinical trial (ResPECT). Clinical Infectious Disease, <https://doi.org/10.1093/cid/ciaa900>, 2020.
* B Yang, AT Huang, B Garcia-Carreras, WE Hart, A Staid, **MDT Hitchings**, et al. Effect of specific non-pharmaceutical intervention policies on SARS-CoV-2 transmission in the counties of the United States. Nature Communications, 12(1), 1-10, 2021.
* Y Boum, A Juan-Giner, **MDT Hitchings**, A Soumah, T Strecker, et al. Humoral and cellular immune response induced by rVSVΔG-ZEBOV-GP vaccine among frontline workers during the 2013-2016 West Africa Ebola outbreak in Guinea. Vaccine, 38(31), 4877-4884, 2020.
* S Isanaka, **MDT Hitchings**, F Berthé, A Briend, RF Grais. Linear growth faltering in young children and the role of weight attainment: prospective analysis of children recovering from severe wasting in Niger. Maternal and Child Nutrition, 15(4): e12817, 2019.
* RE Kahn, **MDT Hitchings**, SE Bellan, and M Lipsitch. Impact of stochastically generated heterogeneity in hazard rates on individually randomized vaccine efficacy trials. Clinical Trials, 15(2), 2018.
* RE Kahn, **MDT Hitchings**, R Wang, SE Bellan, and M Lipsitch. Analyzing Vaccine Trials in Epidemics With Mild and Asymptomatic Infection. American Journal of Epidemiology, <https://doi.org/10.1093/aje/kwy239>, 2018.
* ME Coldiron, B Assao, A-L Page, **MDT Hitchings**, G Alcoba, I Ciglenecki, et al. Single-dose oral ciprofloxacin prophylaxis as a response to a meningococcal meningitis epidemic in the African meningitis belt: a three-arm, open-label, cluster-randomised trial. PLoS Medicine, 15(6), 2018.
* ME Coldiron, G Alcoba, I Ciglenecki, **MDT Hitchings**, A Djibo, A-L Page, C Langendorf and RF Grais. Ciprofloxacin for contacts of cases of meningococcal meningitis as an epidemic response: study protocol for a cluster-randomized trial. Trials, 18(294), 2017.

**CONFERENCES**

* American Society for Tropical Medicine and Hygiene (ASTMH), 2022, Seattle WA: Previous dengue infection among children in Puerto Rico and implications for dengue vaccine implementation (poster presentation)
* Conference on Retroviruses and Opportunistic Infections (CROI), 2022, Virtual: A mixture model to estimate SARS-CoV-2 seroprevalence in Chennai, India (poster presentation)
* Epidemics 7, 2019, Charleston NC: A mixture model to assess the immunogenicity of an oral rotavirus vaccine among healthy infants in Niger (poster presentation)
* JSM 2018, Vancouver BC: Competing effects of indirect protection and clustering on the power of cluster-randomized controlled vaccine trials (oral presentation)
* Epidemics 6, 2017, Barcelona, Spain: Competing effects of indirect protection and clustering on the power of cluster-randomized controlled vaccine trials (poster presentation)
* MIDAS Conference, 2017, Atlanta GA: Competing effects of indirect protection and clustering on the power of cluster-randomized controlled vaccine trials (poster presentation)
* Epidemics 5, 2015, Clearwater Beach, FL: Using simulation to aid trial design: Ring-vaccination trials (poster presentation)

**TEACHING AND AWARDS**

* Course Instructor (University of Florida), PHC 6059 – Applied Survival Analysis
* Course Instructor (University of Florida), Short Course “Statistical methods of analyzing transmission and control of infectious disease”, ICSA Symposium 2022.
* Teaching Assistant (Harvard University), ESPP 90d – Planetary Health: Understanding Human Health Impacts of Accelerating Environmental Change, 2017 (Instructors: Dr. Samuel Myers and Dr. Christopher Golden)
* Teaching Assistant (HSPH), EPI 203 – Study Design in Epidemiologic Research, 2017 (Instructor: Dr. Sonia Hernandez-Diaz)
* Teaching Assistant (HSPH), EPI 202 – Epidemiologic Methods 2: Elements of Epidemiologic Research, 2016 and 2017 (Instructors: Dr. Murray Mittleman and Dr. Elizabeth Mostofsky)
* Teaching Assistant (HSPH), EPI 201 – Introduction to Epidemiology: Methods I, 2015 and 2016 (Instructors: Dr. Murray Mittleman and Dr. Elizabeth Mostofsky)
* Teaching Assistant Award (HSPH), 2017
* Certificate of Distinction in Teaching (HSPH Department of Epidemiology), 2017

**EDITORIAL ACTIVITIES**

* Reviewer: eLife, BMJ Global Health, International Journal of Epidemiology, PLoS ONE, Journal of Royal Society Interface, Lancet Infectious Diseases, Med, New England Journal of Medicine, Clinical Infectious Diseases, Lancet Regional Health – Americas, Lancet Regional Health – Western Pacific, PloS Computational Biology, PloS Medicine, Nature Communications.

**RESEARCH GRANT PARTICIPATION**

* NSF (Co-PI, 09/2022-08/2023)
  + Principal Investigator: Derek Cummings
  + RAPID Grant “Statistical inference of incidence of SARS-CoV-2 in the US using multiple data streams to identify levels of immunity and the impact of non-pharmaceutical interventions”
  + Primary goal: To integrate multiple independent data streams, including US CDC SARS-CoV-2 serosurveys and reported COVID-19 cases and deaths, using statistical and mechanistic models to estimate the rate of seroreversion in assays used in serosurveys across the US, and estimate seroprevalence and cumulative incidence over time by state.
* CDC (PI)
  + Intergovernmental Personnel Agreement
  + Primary Goal: Provide support and recommendations regarding design and study plans for evaluation of different interventions for arboviral disease, including vaccines and vector control.
* Merck, Sharp, and Dohme (03/2022-12/2023)
  + Principal Investigator: Derek Cummings
  + Estimating the incidence of dengue in travelers from non-endemic countries
  + Primary goal: To estimate dengue infections among travelers using local forces of infection and airline travel data
  + Role: Co-Investigator
* NIH/NIAID (R01AI39761)
  + Prinicpal Investigator: Natalie Dean.
  + Design and Analysis of Vaccine Trials for Emerging Infectious Disease Threats
  + Primary Goal: The major goal of this project is to develop innovative study designs and analysis methods for the estimation of vaccine efficacy and effectiveness from vaccine trials for emerging infectious disease threats of national and international importance.
  + Role: Co-Investigator
* NIAID/DMID (A307122)
  + Principal Investigator: Srilatha Edupuganti.
  + A cluster-randomized trial to evaluate the efficacy of Wolbachia-infected Aedes aegypti mosquitoes in reducing the incidence of arboviral infection in Brazil (EVITA Dengue)
  + Primary Goal: To evaluate whether release of Wolbachia-infected Aedes aegypti mosquitoes plus standard Aedes vector control measures reduces the sero-incidence of ARBV infection compared to standard Aedes vector control measures alone.
  + Role: Co-Investigator
* Epicentre/CEPI (8/4/20-3/31/22)
  + Principal Investigator: Derek Cummings
  + Primary Goal: Statistical support for an Ebola Vaccine Trial in DRC. This work is supported by a grant from CEPI to support a trial of a vaccine trial to assess the impact of a vaccine to protect individuals from Ebola infection. Dr. Cummings will provide analytic tools to support design and analysis of trial data.
  + Role: Involved in writing of the grant; supporting the goals of the grant