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KATHERINE HOFFMAN

I am a Research Biostatistician passionate about meaningful and reproducible research. I enjoy expanding my knowledge of statistical methodology, especially non-parametric causal inference. I am an organized but creative thinker who likes to create unique data visualizations to explain study designs and statistical estimation methods. I am particularly interested in applying novel methodology to complex health services applications, and improving communication between data analysts and health-researchers.

EDUCATION

University of Michigan, Ann Arbor, MI — *M.S. in Biostatistics*   SEP 2016 – MAY 2018
University of Detroit Mercy, Detroit, MI — *B.S. in Biochemistry*   SEP 2011 – MAY 2015

EXPERIENCE

Weill Cornell Medicine, New York, NY

Research Biostatistician III   NOV 2021 – PRESENT
Research Biostatistician II   JUL 2020 – SEP 2021
Research Biostatistician I   AUG 2018 – JUN 2020

- **Biostatistical Collaborator for Division of Pulmonary and Critical Care Medicine (PCCM)**: leading study design, data management, statistical modeling, and manuscript writing in collaboration with clinicians, managing all projects requiring statistical support within PCCM; educating researchers on data repositories and contemporary tools in epidemiology and statistics; independently generating ideas for new research on acute and chronic lung diseases in a critical ill population. Current projects include a Phase 1b clinical trial for Acute Respiratory Distress Syndrome (ARDS), examining -omics panels as predictors to poor outcomes for sepsis patients, and estimating the effect modification of organ transplants on sepsis and mortality.
- **Assists Dr. Iván Díaz with illustrative applications** for novel causal inference methodology papers: developing analytical files, modifying software, generating figures, writing application sections.
- **Supervises four Research Biostatisticians:** meeting weekly with supervisees, assisting with project priorities, mentoring technically and professionally.
- **Hiring co-manager** for new research biostatistician hires: reviewing applications, organizing first-round interviews, screening candidates via 30 minute zoom call.

University of Michigan, Ann Arbor, MI

Graduate Student Research Assistant   FEB 2017 – MAY 2018

- Analyzed the association of air pollution with end stage renal failure using geospatial analysis in R with Dr. Peter Song's Biostatistics Lab.
- Searched for inversions in the dog genome using Python and UNIX with Dr. Jeffrey Kidd's Computational Biology Lab.
- Visualized feeding patterns of *Drosophila* from high-dimensional data sets in R with Dr. Monica Dus' Neuroscience and Epigenetics Lab.

SOFTWARE

Active: R, markdown, LaTeX, git/Github, UNIX, SAS, Adobe Creative Cloud

Previous: Python, SQL, Matlab, Java, Maple

TEACHING

Teaching Assistant

- *Modern Methods for Causal Inference.* Weill Cornell Medicine – prepared and graded homework assignments, ran a weekly applied lab, held office hours, provided feedback on applied end-of-semester projects, and gave guest lectures for 10-30 M.S. Biostatistics and Data Science students – Summer 2019, 2020, and 2021, and Spring 2022.
- *Introduction to Health Services Research.* Weill Cornell Medicine – graded three open-answer assignments and held office hours for 30 M.S. Health Informatics students – Fall 2021.
- *Biostatistics II.* Weill Cornell Medicine – graded 10 theoretical and applied assignments and held office hours for 30 M.S. Biostatistics and Data Science students – Winter 2019.
- *Data Science I.* Weill Cornell Medicine – graded 4 programming homeworks and end-of-semester projects, ran 3 R labs, held office hours for 35 M.S. Biostatistics and Data Science students – Fall 2019.

Invited Lectures

- Communicating with a Statistician. Weill Cornell Medicine – July 2022.
- Longitudinal Data Analysis. Weill Cornell Medicine – March 2020, 2021, and 2022.
- Big Data and Statistical Learning for Pulmonary and Critical Care. Weill Cornell Medicine –April 2022.

Scientific Communication (Selected works)

- A Day in the Life of a Biostatistician. KH Stats (>14,000 views) – April 2019.
- An Illustrated Guide to Targeted Maximum Likelihood Estimation, Introduction and Motivation. KH Stats (>8,000 views) – December 2020.
- Customizable Correlations Plots in R. KH Stats (>6,000 views) – June 2022.
- An Illustrated Guide to Superlearning. KH Stats (>5,500 views) – Oct 2020.
- An Illustrated Guide to Targeted Maximum Likelihood Estimation, the Algorithm. KH Stats (>5,000 views) – December 2020.
- On the Sidelines: NYC's COVID-19 Outbreak from the Eyes of a Pulmonary and Critical Care Team's Biostatistician. KH Stats (>3,500 views) – Oct 2020.
- Stats on Drugs: Interview with a Pharma-CRO Biostatistician. KH Stats (>3,500 views) – Nov 2019.
- An Illustrated Guide to Targeted Maximum Likelihood Estimation, Properties, Theory, and Learning more. KH Stats (>3,000 views) – December 2020.
- An Illustrated Introduction to Modified Treatment Policies. KH Stats (>1,000 views) – April 2022.
- Conditional and Iterated Expectations as Linear Regression Models (>1,000 views) – July 2020.
- Swimmer Plots for Multiple Variables using ggplot2. KH Stats (>1,000 views) – June 2022.
- Statistical Intuition for Optimal Treatment Regimes. KH Stats – July 2022.

TALKS

- Swimmer Plots using ggplot2. R/Medicine conference – Remote – Aug 2022.
- Corticosteroids in COVID-19: Optimizing Observational Research through Target Trial Emulations. American Causal inference Conference. Berkeley, CA – May 2022.

- Tips and Tricks for Table 1's. Weill Cornell Medicine Biostatistics Computing Club – New York, NY – July 2022.
- Introduction to Ensemble Learning. Weill Cornell Medicine Biostatistics Computing Club – New York, NY – Jan 2021.
- Power Calculations in R. Weill Cornell Medicine Biostatistics Computing Club – New York, NY – Jan 2020.
- Become a super learner! Introduction to super learning and the sl3 package. NYC R-Ladies – New York, NY – Sept 2019.
- R Projects, the here package, and other tips from the NYC R Conference. Weill Cornell Medicine Biostatistics Computing Club – New York, NY – June 2019.
- Fireproof your Computer from Jenny Bryan! Learn the here package. NYC R-Ladies Lightning Talks – New York, NY – June 2019.
- Overview of dplyr: Weill Cornell Medicine Biostatistics Computing Club. New York, NY – March 2019.
- Learning Impact of Air Pollution on Kidney Disease Epidemiology in US and East China Using Big Public Health Data. Shanghai Jiao Tong University. Shanghai, China – March 2018.

POSTERS

- Estimating the Causal Effect of Sepsis on Mortality in Intensive Care Unit patients with and without a solid organ transplant. Joint Statistical Meetings – Remote – Aug 2020.
- Estimating the Causal Effect of Digoxin using Marginal Structural Models. Joint Statistical Meetings – Denver, CO – Aug 2019.
- Learning Impact of Air Pollution on Kidney Disease Epidemiology in US and East China Using Big Public Health Data. Michigan Institute for Data Science Symposium – Ann Arbor, MI – Nov 2017.

PUBLICATIONS

*Indicates authors contributed equally to the manuscript.

1. **Katherine L Hoffman**, Edward J Schenck, Michael J Satlin, William Whalen, Di Pan, Nicholas Williams, and Ivan Diaz. Corticosteroids in covid-19: Optimizing observational research through target trial emulations. *Under revision and resubmission at JAMA Network Open*, 2022
2. **Katherine Hoffman**. Covid-19: a view from the sidelines. *Significance*, 18(1):40−43, 2021
3. Luis G Gomez-Escobar*, **Katherine L Hoffman***, Justin J Choi, Alain Borczuk, Steven Salvatore, Sergio L Alvarez-Mulett, Manuel D Galvan, Zhen Zhao, Sabrina E Racine-Brzostek, He S Yang, et al. Cytokine signatures of end organ injury in covid-19. *Scientific reports*, 11(1):1−15, 2021
4. Edward J Schenck*, **Katherine L Hoffman***, Clara Oromendia, Elizabeth Sanchez, Eli J Finkelsztein, Kyung Sook Hong, Joseph Kabariti, Lisa K Torres, John S Harrington, Ilias I Siempos, et al. A comparative analysis of the respiratory subscore of the sequential organ failure assessment scoring system. *Annals of the American Thoracic Society*, 18(11):1849−1860, 2021
5. **Hoffman, Katherine**. A beautiful affliction: Tracing the role of mentally ill artists in reducing the negative stigma of mental illness, Undergraduate Thesis for fulfillment of the Honors Program, 2015
6. Edward J Schenck, **Katherine Hoffman**, Parag Goyal, Justin Choi, Lisa Torres, Kapil Rajwani, Christopher W Tam, Natalia Ivascu, Fernando J Martinez, and David A Berlin. Respiratory mechanics and gas exchange in covid-19−associated respiratory failure. *Annals of the American Thoracic Society*, 17(9):1158−1161, 2020
7. Ivan Diaz, **Katherine L Hoffman**, and Nima S Hejazi. Causal survival analysis under competing risks using longitudinal modified treatment policies. *arXiv preprint arXiv:2202.03513*, 2022
8. Ivan Diaz, Nicholas Williams, **Katherine L Hoffman**, and Edward J Schenck. Nonparametric causal effects based on longitudinal modified treatment policies. *Journal of the American Statistical Association*, pages 1−16, 2021
9. David R Price, **Katherine L Hoffman**, Clara Oromendia, Lisa K Torres, Edward J Schenck, Mary E Choi, Augustine MK Choi, Rebecca M Baron, Jin-Won Huh, and Ilias I Siempos. Effect of

neutropenic critical illness on development and prognosis of acute respiratory distress syndrome. *American journal of respiratory and critical care medicine*, 203(4):504–508, 2021

10. David R Price, **Katherine L Hoffman**, Elizabeth Sanchez, Augustine MK Choi, and Ilias I Siempos. Temporal trends of outcomes of neutropenic patients with ards enrolled in therapeutic clinical trials. *Intensive care medicine*, 47(1):122–123, 2021

11. Edward J Schenck, **Katherine L Hoffman**, Marika Cusick, Joseph Kabariti, Evan T Sholle, and Thomas R Campion Jr. Critical care database for advanced research (cedar): An automated method to support intensive care units with electronic health record data. *Journal of Biomedical Informatics*, 118:103789, 2021

12. Lisa K Torres, **Katherine L Hoffman**, Clara Oromendia, Ivan Diaz, John S Harrington, Edward J Schenck, David R Price, Luis Gomez-Escobar, Angelica Higuera, Mayra Pinilla Vera, et al. Attributable mortality of acute respiratory distress syndrome: a systematic review, meta-analysis and survival analysis using targeted minimum loss-based estimation. *Thorax*, 76(12):1176–1185, 2021

13. William Z Zhang, **Katherine L Hoffman**, Kristen T Schiffer, Clara Oromendia, Michelle C Rice, Igor Barjaktarevic, Stephen P Peters, Nirupama Putcha, Russell P Bowler, J Michael Wells, et al. Association of plasma mitochondrial dna with copd severity and progression in the spiromics cohort. *Respiratory research*, 22(1):1–11, 2021

14. Karissa Weidman, Elyse LaFond, **Katherine L Hoffman**, Parag Goyal, Christopher N Parkhurst, Heather Derry-Vick, Edward Schenck, and Lindsay Lief. Post-intensive care unit syndrome in a cohort of covid-19 survivors in new york city. *Ann Am Thorac Soc*, pages 1158–1168, 2022

15. David R Price, Elisa Benedetti, **Katherine L Hoffman**, Luis Gomez-Escobar, Sergio Alvarez-Mulett, Allyson Capili, Hina Sarwath, Christopher N Parkhurst, Elyse Lafond, Karissa Weidman, et al. Angiopoietin 2 is associated with vascular necroptosis induction in coronavirus disease 2019 acute respiratory distress syndrome. *The American journal of pathology*, 192(7):1001–1015, 2022

16. Chang Su, **Katherine Hoffman**, Xu Zhenxing, Elizabeth Sanchez, Ilias Siempos, John S Harrington, Alexandra Racanelli, Maria Plataki, Fei Wang, and Edward J Schenck. Evaluation of albumin kinetics in mechanically ventilated patients with covid-19 compared to those with sepsis-induced ards. *medRxiv*, 2021

17. Chang Su, Zhenxing Xu, **Katherine Hoffman**, Parag Goyal, Monika M Safford, Jerry Lee, Sergio Alvarez-Mulett, Luis Gomez-Escobar, David R Price, John S Harrington, et al. Identifying organ dysfunction trajectory-based subphenotypes in critically ill patients with covid-19. *Scientific Reports*, 11(1):1–13, 2021

18. William Z Zhang, Michelle C Rice, **Katherine L Hoffman**, Clara Oromendia, Igor Z Barjaktarevic, J Michael Wells, Annette T Hastie, Wassim W Labaki, Christopher B Cooper, Alejandro P Comellas, et al. Association of urine mitochondrial dna with clinical measures of copd in the spiromics cohort. *JCI insight*, 5(3), 2020

19. Katerina Andreadis, **Katherine Hoffman**, Debra D'Angelo, and Lucian Sulica. Sulcus vocalis: Results of excision without reconstruction. *The Laryngoscope*, 130(9):2208–2212, 2020

20. Aneela Rahman, Eva Schelbaum, **Katherine Hoffman**, Ivan Diaz, Hollie Hristov, Randolph Andrews, Steven Jett, Hande Jackson, Andrea Lee, Harini Sarva, et al. Sex-driven modifiers of alzheimer risk: a multimodality brain imaging study. *Neurology*, 95(2):e166–e178, 2020

21. Alberto Pinsino, Giulio M Mondellini, Eugene A Royzman, **Katherine L Hoffman**, Debra D'Angelo, Melissa Mabasa, Antonia Gaudig, Amelia M Zuver, Amirali Masoumi, A Reshad Garan, et al. Cystatin c-versus creatinine-based assessment of renal function and prediction of early outcomes among patients with a left ventricular assist device. *Circulation: Heart Failure*, 13(1):e006326, 2020

22. Tariq Chukir, Yi Liu, **Katherine Hoffman**, John P Bilezikian, and Azeez Farooki. Calcitriol elevation is associated with a higher risk of refractory hypercalcemia of malignancy in solid tumors. *The Journal of Clinical Endocrinology & Metabolism*, 105(4):e1115–e1123, 2020

23. Christian P Soneru, Charles A Riley, **Katherine Hoffman**, Abtin Tabaee, and Theodore H Schwartz. Intra-operative mri vs endoscopy in achieving gross total resection of pituitary adenomas: a systematic review. *Acta Neurochirurgica*, 161(8):1683–1698, 2019

24. Harpreet S Bhatia, Joseph Bailey, Ozan Unlu, **Katherine Hoffman**, and Robert J Kim. Efficacy and safety of direct oral anticoagulants in patients with atrial fibrillation and chronic kidney disease. *Pacing and Clinical Electrophysiology*, 42(11):1463–1470, 2019

25. Jamuna K Krishnan, Mangala Rajan, Benjamin R Baer, **Katherine L Hoffman**, Mark N Alshak, Kerri I Aronson, Parag Goyal, Chiomah Ezeomah, Shanna S Hill, Fernando J Martinez, et al.

Assessing mortality differences across acute respiratory failure management strategies in covid-19. *Journal of Critical Care*, 70:154045, 2022

26. Jade I Basem, Anna F Roth, Robert S White, Virginia E Tangel, Silis Y Jiang, Jacky M Choi, **Katherine L Hoffman**, Edward J Schenck, Zachary A Turnbull, Kane O Pryor, et al. Patient care in rapid-expansion intensive care units during the covid-19 pandemic crisis. *BMC anesthesiology*, 22(1):1–11, 2022

27. Moritz Reiterer, Mangala Rajan, Nicolas Gomez-Banoy, Jennifer D Lau, Luis G Gomez-Escobar, Ankit Gilani, Sergio Alvarez-Mulett, Evan T Sholle, Vasuretha Chandar, Yaron Bram, et al. Hyperglycemia in acute COVID-19 is characterized by insulin resistance and adipose tissue infectivity by SARS-CoV-2. *Cell metabolism*, 33(11)2174–2188, 2021

28. Elizabeth Mauer, Jihui Lee, Justin Choi, Hongzhe Zhang, **Katherine L Hoffman**, Imaani J Easthausen, Mangala Rajan, Mark G Weiner, Rainu Kaushal, Monika M Safford, et al. A predictive model of clinical deterioration among hospitalized covid-19 patients by harnessing hospital course trajectories. *Journal of biomedical informatics*, 118:103794, 2021

29. X Wu, S Poli De Frias, S Taheri, I, **Hoffman, K** and Easthausen, AJ Esposito, LD Quesada Arias, E Ayaub, R Maurer, R Gill, et al. Differential protein expression in rheumatoid arthritis interstitial lung disease. In *D105. ILD EPIDEMIOLOGY II*, pages A7796–A7796. American Thoracic Society, 2020

30. Uqba Khan, Cristian Pena, Julianna Brouwer, **Katherine Hoffman**, Arindam Roy Choudhury, Chao Zhang, Prashant Thakkar, Doron Betel, Sandipto Sarkar, Gregory Sonnenberg, et al. Impact of antibiotic use on response to treatment with immune checkpoint inhibitors. *American Journal of Clinical Oncology*, 2019

31. Sergio Alvarez-Mulett, Mustafa Buyukozkan, Alexandra C Racanelli, Frank Schmidt, Richa Batra, **Katherine L Hoffman**, Hina Sarwath, Rudolf Engelke, Luis Gomez-Escobar, Will Simmons, et al. Integrative metabolomic and proteomic signatures define clinical outcomes in severe covid-19. *medRxiv*, 2021

32. Parag Goyal, Justin J Choi, Laura C Pinheiro, Edward J Schenck, Ruijun Chen, Assem Jabri, Michael J Satlin, Thomas R Campion Jr, Musarrat Nahid, Joanna B Ringel, et al. Clinical characteristics of covid-19 in new york city. *New England Journal of Medicine*, 382(24):2372–2374, 2020

33. Parag Goyal, Joanna Bryan Ringel, Mangala Rajan, Justin J Choi, Laura C Pinheiro, Han A Li, Graham T Wehmeyer, Mark N Alshak, Assem Jabri, Edward J Schenck, et al. Obesity and covid-19 in new york city: a retrospective cohort study. *Annals of internal medicine*, 173(10):855–858, 2020

34. Maria Plataki, Di Pan, Parag Goyal, **Katherine Hoffman**, Jacky Man Kwan Choi, Hao Huang, Monika M Safford, and Edward J Schenck. Association of body mass index with morbidity in patients hospitalised with covid-19. *BMJ open respiratory research*, 8(1):e000970, 2021

35. Greer Waldrop, Seyed A Safavynia, Megan E Barra, Sachin Agarwal, David A Berlin, Amelia K Boehme, Daniel Brodie, Jacky M Choi, Kevin Doyle, Joseph J Fins, et al. Prolonged unconsciousness is common in covid-19 and associated with hypoxemia. *Annals of neurology*, 2022

36. E Coskun, R Kalil, A Yin, G Wehmeyer, **K Hoffman**, R Kopparam, P Goyal, R Kaner, and E Siegler. Outcomes of the oldest old admitted with covid-19. *Journal of Palliative Care, 2022*.

37. Jamuna K Krishnan, Kayley M Ancy, Clara Oromendia, **Katherine L Hoffman**, Imaani Easthausen, Nancy K Leidy, MeiLan K Han, Russell P Bowler, Stephanie A Christenson, David J Couper, et al. Characterizing copd symptom variability in the stable state utilizing the evaluating respiratory symptoms in copd instrument. *Chronic Obstructive Pulmonary Diseases: Journal of the COPD Foundation*, 9(2):195, 2022 39.

38. Michael J Satlin, Liang Chen, Angela Gomez-Simmonds, Jamie Marino, Gregory Weston, Tanaya Bhowmick, Susan K Seo, Steven J Sperber, Angela C Kim, Brandon Eilertson, et al. Impact of a rapid molecular test for klebsiella pneumoniae carbapenemase and ceftazidime-avibactam use on outcomes after bacteremia caused by carbapenem-resistant enterobacterales. *Clinical Infectious Diseases*, 2022 40.

39. Richa Batra, William Wahlen, Sergio Alvarez-Mulett, **Katherine Hoffman**, Will Simmons, John Harrington, Kelsey Chetnik, Mustafa Buyukozkan, Elisa Benedetti, Mary E Choi, et al. Multi-omic comparative analysis of covid-19 and bacterial sepsis-induced ards. *medRxiv*, 2022

HONORS & AWARDS

- NSF Early Career Researchers Travel Scholarship – May 2022.
- University of Michigan Graduate Student Research Assistant Tuition Scholarship – 2017-2018.
- University of Detroit Mercy Softball All Decade, Second Team – 2020.
- University of Detroit Mercy Leadership Pin – April 2015.
- University of Detroit Mercy Honors program graduate – April 2015.
- University of Detroit Mercy *Magna Cum Laude* – April 2015.
- University of Detroit Mercy "Dad Butler" award for student-athletes demonstrating exceptional determination in rehabilitating from a sports injury – April 2014.
- University of Detroit Mercy Softball Tuition Scholarship – 2011-2015.

LEADERSHIP

- Co-host of Weill Cornell Medicine Biostatistics Computing Club – 2021-present.
- Host of Weill Cornell Medicine causal inference reading group – 2019-2020.
- Co-president of Michigan Biostatistics Student Association– 2017-2018.
- University of Michigan Statistics in the Community (STATCOM) team member – 2016-2018.
- Head coach of Milan Junior Varsity softball team – 2016.
- Co-captain of NCAA Division I softball team – 2014-2015.
- Team representative for NCAA Student-Athlete Advisory Committee – 2013-2015.