Email: kathoffman.stats@gmail.com
Blog: khstats.com
Github: github.com/kathoffman
Twitter: @kat_hoffman_

KATHERINE HOFFMAN

I am a Research Biostatistician passionate about meaningful and reproducible medical 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 clinical applications, and improving communication between data analysts and physician-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

- **Primary biostatistician for Division of Pulmonary and Critical Care Medicine (PCCM)**: leading study design, data management, statistical modeling, and manuscript writing in collaboration with physician researchers, managing all projects requiring statistical support within PCCM; educating researchers on novel statistical methodology; independently generating ideas for new research on acute and chronic lung diseases.
- **Assists Dr. Iván Díaz with illustrative applications** for novel causal inference methodology papers: developing analytical files, modifying software, generating figures, writing application sections.
- **Supervises three 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

- Geospatial analysis of association of air pollution with end stage renal failure using 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

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. 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.

TEACHING

Teaching Assistant

- Modern Methods for Causal Inference: Summer 2019, Summer 2020, Summer 2021, Spring 2022
- Introduction to Health Services Research: Fall 2021
- Biostatistics II: Winter 2019
- Data Science I: 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.

PUBLICATIONS

*Indicates authors contributed equally to the manuscript.

1. **Hoffman, Katherine L**, 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 at JAMA Network Open*, 2022

2. **Hoffman, Katherine**. Covid-19: a view from the sidelines. *Significance*, 18(1):40–43, 2021

3. Luis G Gomez-Escobar*, **Hoffman*, Katherine L**, 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*, **Hoffman*, Katherine L**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine**, 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, **Hoffman, Katherine L**, 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, **Hoffman, Katherine L**, 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 adipose tissue dysfunction and insulin resistance. *MedRxiv*, 2021

28. Elizabeth Mauer, Jihui Lee, Justin Choi, Hongzhe Zhang, **Hoffman, Katherine L**, 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 Pen~a, Julianna Brouwer, **Hoffman, Katherine**, 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., 2019

31. Sergio Alvarez-Mulett, Mustafa Buyukozkan, Alexandra C Racanelli, Frank Schmidt, Richa Batra, **Hoffman, Katherine L**, 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, **Hoffman, Katherine**, 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. 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 adipose tissue dysfunction and insulin resistance. *MedRxiv*, 2021

36. 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

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.
- Co-president of Michigan Biostatistics Student Association– 2017-2018.

- University of Michigan Statistics in the Community (STATCOM) project teammate – 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.