Sharon E. Davis, PhD

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Education:

- Duke University (Durham, NC), AB with distinction, 2004
  Major: Environmental sciences and policy; Minors: Computer science and biology
- North Carolina State University (Raleigh, NC): Master of Statistics, 2008
- Johns Hopkins University, Bloomberg School of Public Health (Baltimore, MD): Certificate in Public Health Informatics, 2012
- Vanderbilt University (Nashville, TN): Master of Science in Biomedical Informatics, 2017
- Vanderbilt University (Nashville, TN): Doctor of Philosophy in Biomedical Informatics, 2019

Academic Appointments:

- Associate in Research, Children's Environmental Health Initiative, Duke University (Durham, NC): 2004 – 2011
- Senior Statistician, Children's Environmental Health Initiative, University of Michigan (Ann Arbor, MI): 2011 – 2016
- National Library of Medicine Predoctoral Fellow, Department of Biomedical Informatics, Vanderbilt University: 2013 – 2018
- Research Assistant Professor, Department of Biomedical Informatics, Vanderbilt University Medical Center: 2019 – present
- Faculty Scientist, Center for Improving the Public's Health through Informatics, Department of Biomedical Informatics, Vanderbilt University Medical Center: 2019 – present

Professional Organizations:

- American Statistical Association (2006 – 2008)
- American Medical Informatics Association (2013 – present)

Professional Activities:

Intramural:

- Curriculum Committee Student Representative, Department of Biomedical Informatics Graduate Student Council, Vanderbilt University (2016 – 2017)

Extramural:

- Student Editorial Board, Journal of the American Medical Informatics Association: 2014 - 2015
- Program Committee Co-chair, 2018 National Library of Medicine Informatics Training Conference (Nashville, TN)
- Manuscript and Conference Peer Reviewer:
  - Applied Clinical Informatics: 2015 – present
  - Journal of the American Medical Informatics Association: 2015 – present
  - Journal of Biomedical Informatics: 2020
  - AMIA Informatics Summit: 2016 – present
  - AMIA Annual Symposium: 2014 – present

Honors:

1. 1st place in the AMIA Knowledge Discovery and Data Mining Workgroup Student Paper Competition: 2017
2. 2nd place Student Innovation Award for the AMIA Knowledge Discovery and Data Mining Workgroup: 2019
3. Martin Epstein Award for 1st place in AMIA Student Paper Competition: 2019
4. 2nd place (Honorable Mention) in AMIA Doctoral Dissertation Award: 2020

Teaching Activities:

Graduate Courses:

1. Vanderbilt University BMIF 6300 – Foundations of Biomedical Informatics
   - Teaching assistant to Mark Frisse: Fall semesters 2017, 2018
   - Substantially revised course content and teaching approach prior to Fall 2017
2. Vanderbilt University BMIF 6321A – Scientific Communication
   - Co-instructor with Trent Rosenbloom: Fall semesters, 2019-present
3. Vanderbilt University BMIF 6321B – Scientific Communication
   - Co-instructor with Trent Rosenbloom: Spring semesters 2020-present
4. Vanderbilt University BMIF 6315 – Methods in Biomedical Informatics
   - Co-instructor with Dario Giuse: Spring 2020
5. Vanderbilt University EPI 8331 – Methods in Measurement
   - Guest lecture: 2019-2020 (Introduction to Machine Learning)

Publications and Presentations:

Google scholar page: https://scholar.google.com/citations?user=E0PiP4sAAAAJ&hl=en

Articles in Refereed Journals:

1. Miranda ML, Keating MH, and **Edwards SE**. 2008. "Environmental justice implications of reduced reporting requirements of the Toxics Release Inventory Burden Reduction Rule." *Environmental Science and Technology*. 42: 5407-5414. PMCID: PMC2847774

2. Miranda ML, Maxson PJ, and **Edwards SE**. 2009. "Environmental contributions to disparities in pregnancy outcomes." *Epidemiologic Reviews*. 31: 67-83. PMID: 19846592

3. Gray SC, **Edwards SE**, and Miranda ML. 2010. "Assessing exposure metrics for PM and birth weight models." *Journal of Exposure Science and Environmental Epidemiology*. 20(5): 469-477. PMCID: PMC2889210

4. Miranda ML, Swamy GK, **Edwards SE**, Maxson PJ, Gelfand A, and James SA. 2010. "Disparities in maternal hypertension and pregnancy outcomes: evidence from North Carolina, 1994-2003." *Public Health Reports*. July/August 125(4): 579-587. PMCID: PMC2882609

5. Miranda ML, **Edwards SE**, Swamy GK, Paul CJ, and Neelon B. 2010. "Blood lead levels among pregnant women: historical versus contemporaneous exposures." *International Journal of Environmental Research and Public Health*. 7(4): 1508-1519. PMCID: PMC2872339

6. Miranda ML, **Edwards SE**, and Myers ER. 2011. "Adverse birth outcomes among nulliparous versus multiparous women." *Public Health Reports.* 126(6): 797-805. PMCID: PMC3185315

7. Miranda ML, **Edwards SE**, Keating MH, and Paul CJ. 2011. "Making the environmental justice grade: the relative burden of air pollution exposure in the United States." *International Journal of Environmental Research and Public Health*. 8(6): 1755-1771. PMCID: PMC3137995

8. Miranda ML and **Edwards SE**. 2011. "Use of spatial analysis to support environmental health research and practice." *North Carolina Medical Journal*. 72(2): 132-135. PMCID: PMC4064716

9. Miranda ML, **Edwards SE**, and Maxson PJ. 2011. "Mercury levels in an urban pregnant population in Durham County, North Carolina." *International Journal of Environmental Research and Public Health*. 8: 698-712. PMCID: PMC3083665

10. Miranda ML, Anthopolos R, and **Edwards SE**. 2011. "Seasonality of poor pregnancy outcomes in North Carolina." *North Carolina Medical Journal*. 72(6): 447-453. PMID: 22523851

11. Miranda ML, **Edwards SE**, Anthopolos R, Dolinsky DH, and Kemper AR. 2012. "The built environment and childhood obesity in Durham, NC." *Clinical Pediatrics*. 51(8): 750-758. PMCID: PMC3756140

12. Kroeger GL, Messer L, **Edwards SE**, and Miranda ML. 2012. "A novel tool for assessing and summarizing the built environment." *International Journal of Health Geographics*.11:46. PMCID: PMC3517394

13. Vinikoor-Imler L, Gray SC, **Edwards SE**, and Miranda ML. 2012. "The effects of exposure to particulate matter and neighborhood deprivation on gestational hypertension." *Paediatric and Perinatal Epidemiology*. 26(2): 91-100. PMID: 22324494

14. Maxson PJ, **Edwards SE**, Ingram A, and Miranda ML. 2012. "Psychosocial differences between smokers and non-smokers during pregnancy." *Addictive Behaviors*. 37(2): 153-159. PMID: 22000409

15. Swamy GK, **Edwards SE**, Gelfand A, James SA, and Miranda ML. 2012. "Maternal age, birth order, and race: differential effects on birthweight." *Journal of Epidemiology and Community Health*. 66(2):136-142. PMCID: PMC4052610

16. Miranda ML, **Edwards SE**, Chang HH, and Auten RL. 2013. "Proximity to roadways and pregnancy outcomes." *Journal of Exposure Science and Environmental Epidemiology*. 23(1): 32-38. PMID: 22805991

17. Gray SC, **Edwards SE**, and Miranda ML. 2013. "Race, socioeconomic status, and air pollution exposure in North Carolina." *Environmental Research*. 126: 152-158. PMCID: PMC3922656

18. Anthopolos R, **Edwards SE**, and Miranda ML. 2013. "Effects of maternal prenatal smoking and birth outcomes extending into the normal range on academic performance in 4th grade in North Carolina, USA." *Paediatric and Perinatal Epidemiology*. 27(6): 564-574. PMID: 24134528

19. **Edwards SE**, Maxson PJ, Miranda ML, and Fry RC. 2014. "Cadmium levels in a North Carolina cohort: Identifying risk factors for elevated levels during pregnancy." *Journal of Exposure Science and Environmental Epidemiology*. 25(4): 427-432. PMCID: PMC4312255

20. **Edwards SE**, Strauss B, and Miranda ML. 2014. "Geocoding large population-level administrative datasets at highly resolved spatial scales." *Transactions in GIS*. 18(4): 586-603. PMCID: PMC4222194

21. Gray SC, **Edwards SE**, Schultz BD, and Miranda ML. 2014. "Assessing the impact of race, social factors, and air pollution on birth outcomes: A population-based study." *Environmental Health*. 13:4. PMCID: PMC3922656

22. **Davis SE**, Osborn CY, Kripalani S, Goggins KM, and Jackson GP. 2015. "Health literacy, education levels, and patient portal usage during hospitalizations." *Proceedings of the AMIA Annual Symposium, 2015*. 1871-1880. PMCID: PMC4765631

23. Cronin RM, **Davis SE**, Shenson JA, Chen Q, Rosenbloom ST, and Jackson GP. 2015. "Growth of secure messaging through a patient portal as a form of outpatient interaction across clinical specialties." *Applied Clinical Informatics*. 6(2): 288-304. PMCID: PMC4493331

24. Maxson PJ, **Edwards SE**, Valentiner EM, Miranda ML. 2016. "A multidimensional approach to characterizing psychosocial health during pregnancy." *Maternal and Child Health Journal*. 20(6): 1103-1113. PMID: 27107859

25. Masterman M, Cronin RM, **Davis SE**, Shenson JA, Jackson GP. 2016. "Adoption of secure messaging in a patient portal across pediatric specialties." *Proceedings of the American Medical Informatics Association 2016 Annual Symposium*. 1930-1939. PMCID: PMC5333207

26. Robinson J, **Davis SE**, Cronin RM, Jackson GP. 2016. "Use of a patient portal during hospital admissions to surgical services." *Proceedings of the American Medical Informatics Association 2016 Annual Symposium*. 1967-1976. PMCID: PMC5333326

27. Shenson JA, Cronin RM, **Davis SE**, Chen Q, Jackson, GP. 2016. "Rapid growth in surgeons' use of secure messaging in a patient portal." *Surgical Endoscopy*. 30(4): 1432-1440. PMCID: PMC4881849

28. **Davis SE**, Lasko TA, Chen G, Matheny ME. 2017. "Calibration drift among regression and machine learning models for hospital mortality." *Proceedings of the American Medical Informatics Association 2017 Annual Symposium*. 2017:625-634. PMCID: PMC5977580

29. Steitz BD, Cronin RM, **Davis SE**, Yan E, Jackson GP. 2017. "Long-term patterns of patient portal use for pediatric patients at an academic medical center." *Applied Clinical Informatics*. 8(3): 779-793. PMCID: PMC6220688

30. **Davis SE**, Lasko TA, Chen G, Siew ED, Matheny ME. 2017. "Calibration drift in regression and machine learning models for acute kidney injury." *Journal of the American Medical Informatics Association*. 24(6): 1052-1061. PMCID: PMC6080675

31. Koola JD, **Davis SE**, Al-Nimri O, Parr SK, Fabbri D, Malin BA, Ho SB, Matheny ME. 2018. "Development of an automated phenotyping algorithm for hepatorenal syndrome." *Journal of Biomedical Informatics*. 80: 87-95. PMCID: PMC5920557

32. **Davis SE**, Greevy RA, Fonnesbeck C, Lasko TA, Walsh CG, Matheny ME. 2019. "A Nonparametric Updating Method to Correct Clinical Prediction Model Drift." *Journal of the American Medical Informatics Association*. 26(12): 1448-1457. PMCID: PMC6857513

33. Koola JD, Ho SB, Bin Rashid M, Chen G, Perkins A, Cao A, **Davis SE**, Matheny ME. 2019. "Development of a National Department of Veterans Affairs Mortality Risk Prediction Model Among Patients with Cirrhosis." *BMJ Open Gastroenterology*. 6(1): e000342. PMCID: PMC6904155

34. **Davis SE**, Greevy RA, Lasko TA, Walsh CG, Matheny ME. 2019. "Comparison of Prediction Model Performance Updating Protocols: Using a Data-Driven Testing Procedure to Guide Updating." *Proceedings of the American Medical Informatics Association 2019 Annual Symposium*. 1002-1010. PMCID: PMC7153129

35. Koola JD, Ho SB, Cao A, Chen G, Perkins A, **Davis SE**, Matheny ME. 2020. "Predicting 30-Day Hospital Readmission Risk in a National Cohort of Patients with Cirrhosis." *Digestive Diseases Sciences*. 65(4): 1003-1031. PMCID: PMC7073276

Book Chapters:

1. **Edwards SE**, Maxson PJ, Sandberg N, and Miranda ML. 2015. "Air pollution and pregnancy outcomes." In Air Pollution and Health Effects, edited by Srikanth S Nadadur and John W Hollingsworth. Springer Publishers: New York, NY. 51-91.

Presentations at Scientific Meetings:

1. Summit on Clinical Research Informatics. San Francisco, CA. "Calibration drift of clinical prediction models across modeling methods." March 23, 2016.

2. National Library of Medicine Training Conference. Columbus, OH. "Performance drift in clinical prediction across modeling methodologies." June 27, 2016.

3. American Medical Informatics Association Annual Symposium. Washington DC. "Calibration drift among regression and machine learning models for hospital mortality." November 8, 2017.

4. American Medical Informatics Association Annual Symposium. San Francisco, CA. "Developing a testing procedure to select model updating methods." November 5, 2018.

5. American Medical Informatics Association Annual Symposium. Washington DC. "Comparison of Prediction Model Performance Updating Protocols: Using a Data-Driven Testing Procedure to Guide Updating." November 19, 2019.