Curriculum Vitae

Kyle T. Aune, PhD, MPH

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Accomplished environmental epidemiologist with a strong theoretical and practical background in epidemiologic methods, biostatistics, infectious disease epidemiology, climatology, and environmental health. Skilled in management and analysis of large datasets, statistical and geospatial analysis, and data visualization. Strong analytical, communication, and project management skills. Committed to advancing public health research, education, and practice.

EDUCATION

Johns Hopkins Bloomberg School of Public Health Sep 2017 – Jun 2022
Doctor of Philosophy - Exposure Science and Environmental Epidemiology

University of Alabama at Birmingham School of Public Health Aug 2010 – May 2012
Master of Public Health - Epidemiology

Auburn University Aug 2006 – May 2010
Bachelor of Science - Biomedical Sciences

RESEARCH EXPERIENCE

Johns Hopkins Bloomberg School of Public Health – Baltimore, MD Jul 2022 – Dec 2024
Postdoctoral Research Fellow

Developed research protocols and managed regulatory compliance for a study to evaluate changes to indoor air and sleep quality following installation of a cool roof on Baltimore homes. Built survey tools and database management system for participant responses, in home air quality monitoring data, personal actigraphy (sleep quality) data, and urine biomarkers using REDCap and R. Formulated and validated calibration equations for use of low-cost air quality sensors to measure indoor ambient temperature and relative humidity. Provided professional and research mentorship to master's and doctoral students.

Johns Hopkins Bloomberg School of Public Health – Baltimore, MD Nov 2019 – Jun 2022
PhD Candidate

Developed a novel framework for understanding the relationship between extreme precipitation events and infectious respiratory virus transmission. Cleaned, managed, and analyzed very large climate datasets (over 10 billion observations) for relevance to public health using R and ArcGIS Pro. Analyzed spatiotemporal trends in 30 years of daily precipitation data using machine learning. Compared exposure assessment agreement among three high-resolution daily precipitation datasets across the conterminous United States. Collaborated with students across departments to contribute to non-dissertation research leading to four peer-reviewed publications.

Johns Hopkins Bloomberg School of Public Health – Baltimore, MD Aug 2020 – Sep 2021
Graduate Research Assistant

Led a team of master's-level students in developing a program creating toolkits to analyze and visualize COVID-19 testing, vaccination, and mortality data. Developed training materials, protocols, and training guidance for case investigators, contact tracers, and supervisors from the Baltimore City Health Department in coordination with Jhpiego and the National Association of County Health Officials (NACCHO), funded by Bloomberg Philanthropies.

American Sports Medicine Institute – Birmingham, AL Jun 2012 – Jul 2017
Clinical Researcher

Managed and coordinated various aspects of 15+ simultaneous epidemiologic, biomechanical, and clinical outcomes studies. Coordinated and completed study design, regulatory compliance, participant recruitment and enrollment, data collection, statistical analysis, and publication. Independently developed epidemiologic surveillance research protocols. Managed, analyzed, and visualized data using R, SAS, JMP, and Tableau. Supervised data collection and provided education and consultation on study design and analysis to sports medicine fellows and student researchers. Secured over $165,000 in external research funding.

Children's Hospital of Alabama – Birmingham, AL Jan 2012 – Jun 2012
Graduate Research Intern

Completed nosocomial infection analysis in the division of pediatric neurosurgery and reported findings to intra-hospital Infection Control Task Force in quarterly meetings.

University of Alabama at Birmingham – Birmingham, AL Aug 2011 – Jun 2012
Graduate Research Assistant

Conducted wet lab experiments using yeast (*S. cerevisiae*) as a model organism for assessing gene buffering dynamics and synthetic lethality in cell growth and division. Designed and conducted quantitative, high-throughput gene drug interaction experiments.

PEER-REVIEWED PUBLICATIONS

34. **Aune KT**, Wilks M, Green T, Rule AM, McCormack M, Hansel N, Putcha N, Kirk G, Raju S, Koehler K. Calibration of Indoor Temperature and Relative Humidity of the PurpleAir Low-Cost Particulate Matter Sensor. Under review for *Environmental Monitoring and Assessment* February 19, 2024.
33. **Aune KT***, Grantz KH*, Prata-Mendez N*, Robsky KO*, Gurley ES, Marx MA, Phelan-Emrick DF. Demographic and geographic characterization of excess mortality during the COVID-19 pandemic in Baltimore City, MD, March 2020 - March 2021. *American Journal of Epidemiology*. 2023; kwad186, doi: 10.1093/aje/kwad186.
32. **Aune KT**, Zaitchik BF, Curriero FC, Davis MF, Smith GS. Agreement in Extreme Precipitation Exposure Assessment is Modified by Race and Social Vulnerability. *Frontiers in Epidemiology*. 2023; 3:1128501. doi: 10.3389/fepid.2023.1128501
31. Uzzi M, **Aune KT**, Marineau L, Jones FK, Dean LT, Jackson JW, Latkin CA. An intersectional analysis of historical and contemporary structural racism on non-fatal shootings in Baltimore, Maryland. *Injury Prevention*. 2023; 29(1):85-90. doi: 10.1136/ip-2022-044700.
30. **Aune KT,** Davis MF, Smith GS. Extreme Precipitation Events and Infectious Disease Risk: A Scoping Review and Framework for Infectious Respiratory Viruses. *International Journal of Environmental Research and Public Health*. 2022; 19(1):165. doi: 10.3390/ijerph19010165.
29. Denhard LP, Kaviany P, Chicumbe S, Muianga C, Laisse G, **Aune KT,** Sheffel A. How prepared is Mozambique to treat COVID-19 patients? A new approach for estimating oxygen service availability, oxygen treatment capacity, and population access to oxygen-ready treatment facilities. *International Journal for Equity in Health*. 2021; 20(90). doi: 10.1186/s12939-021-01403-8
28. **Aune KT**, Gesch D, Smith GS. A Spatial Analysis of Climate Gentrification in Orleans Parish, Louisiana post-Hurricane Katrina. *Environmental Research*. 2020; 185:109384. doi: 10.1016/j.envres.2020.109384.
27. Dugas JR, Looze CA, Capgna B, Walter BL, Jones CM, Rothermich MA, Fleisig GS, **Aune KT**, Drogosz M, Emblom BA, Cain EL. Ulnar Collateral Ligament Repair with Internal Brace Augmentation in Overhead Throwing Athletes. *American Journal of Sports Medicine*. 2019; 47(5):1096-1102. doi: 10.1177/2325967118S00084.
26. Emblom BA, Mathis T, **Aune KT**. Sports Hernia: Diagnosis, Management, and Operative Treatment of 100 Patients. *Orthopaedic Journal of Sports Medicine*. 2018; 6(9): 232596711879833.
25. Slowik JS, **Aune KT**, Diffendaffer AZ, Cain EL, Fleisig GS. The Relationship between Fastball Velocity and Elbow Varus Torque in Professional Baseball: Does Greater Pitch Velocity Suggest Higher Stress on the Ulnar Collateral Ligament? *Journal of Athletic Training*. 2019; 54(3):296-301.
24. Reinold MM, Macrina LC, Fleisig GS, **Aune KT**, Andrews JR. Effect of a 6-Week Weighted Baseball Throwing Program on Pitch Velocity, Pitching Arm Biomechanics, Passive Range of Motion, and Injury Rates. *Sports Health*. 2018; 10(4):327-333.
23. Colberg RE, Israel MP, **Aune KT**, Fleisig GS. Prevalence of Musculoskeletal Conditions in Adult Recreational Tennis Players. *Journal of Medicine and Science in Tennis*. 2018; 24(2):24-31.
22. Rothermich MA, Conte SA, **Aune KT**, Fleisig GS, Cain EL, Dugas JR. Incidence of elbow ulnar collateral ligament surgery in collegiate baseball players. *Orthopaedic Journal of Sports Medicine*. 2018; 6(4):2325967118764657.
21. Diffendaffer AZ, Fleisig GS, Ivey B, **Aune KT**. Kinematic and Kinetic Differences between Left and Right-Handed Professional Baseball Pitchers. *Sports Biomechanics*. 2019; 18(4):448-455.
20. Gilliam BD, Douglas LR, Fleisig GS, **Aune KT**, Mason KA, Dugas JR, Cain EL, Ostrander RV, Andrews JR. Return to Play and Outcomes in Baseball Players after Superior Labral Anterior-Posterior (SLAP) Repairs. *American Journal of Sports Medicine*. 2018; 46(1):109-115.
19. Fleisig GS, Diffendaffer AZ, Ivey B, **Aune KT**, Laughlin WA, Fortenbaugh D, Bolt B, Lucas W, Moore KD, Dugas JR. Changes in Youth Baseball Pitching Biomechanics: A Seven-Year Longitudinal Study. *American Journal of Sports Medicine*. 2018; 46(1):44-51.
18. Fleisig GS, Diffendaffer AZ, Ivey B, **Aune KT**. Do Baseball Pitchers Improve Mechanics after Biomechanical Evaluations? *Sports Biomechanics*. 2018; 45(8):1815-1821.
17. Read CR, **Aune KT**, Cain EL, Fleisig GS. Return to Play Rate and Decreased Performance after Anterior Cruciate Ligament Reconstruction in National Football League Defensive Players. *American Journal of Sports Medicine*. 2017; 45(8):1815-1821.
16. Fleisig GS, Diffendaffer AZ, **Aune KT**, Ivey B. Biomechanical Analysis of Weighted Ball Throwing Exercises for Baseball Pitchers. *Sports Biomechanics*; 2017; 9(3):210-5.

15. **Aune KT**, Powers J. Injuries in extreme conditioning programs. *Sports Health*; 2016; 9(1):52-8.
14. Colberg RE, **Aune KT**, Propst M. The Prevalence of Musculoskeletal Conditions in Tennis-Teaching Professionals. *Orthopaedic Journal of Sports Medicine*. 2016; 4(10):2325967116668138.
13. Dugas JR, Bedford B, Scillia AS, **Aune KT**, Cain EL. Anterior Cruciate Ligament Injuries in Baseball Players. *Arthroscopy*; 2016; 32(11):2278-84.
12. Fleisig GS, Laughlin WA, **Aune KT**, Cain EL, Dugas JR, Andrews JR. Differences among Fastball, Curveball, and Change-Up Pitching Biomechanics Across Various Levels of Baseball. *Sports Biomechanics*; 2016; 15(2):128-38.
11. Andrachuk JS, Scillia AS, **Aune KT**, Andrews JR, Dugas JR, Cain EL. Symptomatic Heterotopic Ossification Following UCL Reconstruction: Clinical Significance and Treatment Outcomes. *American Journal of Sports Medicine*; 2016; 44(5):1324-8.
10. Laughlin WA, **Aune KT**, Diffendaffer AZ, Fleisig GS. The Effects of Baseball Bat Mass Properties on Swing Mechanics, Ground Reaction, Forces, and Swing Timing. *Sports Biomechanics*; 2016; 15(1):36-47.
9. Wilk KE, Macrina LC, Fleisig GS, **Aune KT**, Porterfield RA, Harker P, Evans TJ, Andrews JR. Deficits in Glenohumeral Passive Range of Motion Increase Risk of Shoulder Injury in Professional Baseball Pitchers: A Prospective Study. *American Journal of Sports Medicine*; 2015; 43(10):2379-85.
8. Etier BE, Scillia AS, Tessier DD, **Aune KT**, Emblom BA, Dugas JR, Cain EL. Return to Play Following Metacarpal Fractures in Football Players. *Hand*; 2015; 10(4):762-6.
7. Colberg RE, **Aune KT**, Choi AJ, Fleisig GS. Incidence and Prevalence of Musculoskeletal Conditions in Collegiate Tennis Athletes. *Journal of Medicine and Science in Tennis*; 2015; 20(3):137-44.
6. Conte SA, Fleisig GS, Dines JS, Wilk KE, **Aune KT**, Patterson N, ElAttrache NS, Yocum, LA. Prevalence of Ulnar Collateral Ligament Surgery in Professional Baseball Players. *American Journal of Sports Medicine*; 2015; 43(7):1764-9.
5. Fleisig GS, Leddon CE, Laughlin WA, Ciccotti MG, Mandelbaum BR, **Aune KT**, Escamilla RF, MacLeod TD, Andrews JR. Biomechanical Performance of Baseball Pitchers with a History of Ulnar Collateral Ligament Reconstruction. *American Journal of Sports Medicine*; 2015; 43(5):1045-9.
4. Scillia AS, **Aune KT**, Andrachuk JS, Cain EL, Dugas JR, Fleisig GS, Andrews JR. Return to Play After Knee Arthroscopy Including Chondroplasty of Articular Cartilage Lesions in National Football League Athletes. *American Journal of Sports Medicine*; 2015; 43(3):663-8.
3. Laughlin WA, Fleisig GS, Scillia AS, **Aune KT**, Cain EL, Dugas JR. Deficiencies in Pitching Biomechanics in Baseball Players with a History of SLAP Repair. *American Journal of Sports Medicine*; 2014; 42(12):2837-41.
2. Wilk KE, Macrina LC, Fleisig GS, **Aune KT**, Porterfield RA, Harker P, Evans TJ, Andrews JR. Deficits in Glenohumeral Passive Range of Motion Increase Risk of Elbow Injury in Professional Baseball Pitchers: A Prospective Study. *American Journal of Sports Medicine*; 2014; 42(9):2075-81.
1. **Aune KT**, Andrews JR, Dugas JR, Cain EL. Return to Play after Lateral Partial Meniscectomy in National Football League Athletes. *American Journal of Sports Medicine*; 2014; 42(8):1865-72.

TEXTBOOK CHAPTERS

1. Han-Lee K, **Aune KT**, Wohl S, Winter AK. Data Visualization. In: Nelson K, Gurley ES, Masters-Williams C, eds. *Infectious Disease Epidemiology Theory and Practice*. 4th ed. Jones & Bartlett. In preparation.

RESEARCH IN MANUSCRIPT DEVELOPMENT

4. **Aune KT**, Zaitchik B, Koehler K, Smith GS. A Machine Learning Approach to Spatiotemporal Characterization of Precipitation in the Mid-Atlantic United States. In preparation.
3. **Aune KT**, Lin Y-T, Koehler K, Levy-Zamora M, Buehler C, Hao L, Gentner D, Datta A. Remote Calibration of a Low-Cost Nitrogen Dioxide Sensor Network with Device-Specific Biases. In preparation.
2. **Aune KT**, Kurowski KM, Gurley ES, Marx MA, Phelan-Emrick DF. Spatial and Sociodemographic Patterns of Change in Excess Mortality During the COVID-19 Pandemic in Baltimore, MD. In preparation.
1. Kurowski KM, Pisanic N, Spicer K, **Aune KT**, Gigot G, Hall D, Hall Jr. D, Rule AM, Heaney CD. Swine fecal waste source tracking on household surfaces proximal to swine concentrated animal feeding operations in southeastern North Carolina, USA. In preparation.

PODIUM AND POSTER PRESENTATIONS

13. **Aune KT,** Smith GS. Leveraging Big Data to Explore the Effects of Climate on Health: Remote-Sensing vs. Ground-Based Observations. Poster presentation at: Environmental Health and Engineering Annual Research Retreat. Baltimore, MD. January 17, 2020.
12. **Aune KT**. Extreme Precipitation and Influenza Hospitalization in Maryland. Oral Presentation at: JHSPH EHE Doctoral Student Seminar. October 8, 2019.
11. **Aune KT**, Gesch DB, Smith GS. Associations between Flooding from Hurricane Katrina and Gentrification in Orleans Parish, Louisiana. Poster presentation at: Environmental Health and Engineering Annual Research Retreat. Baltimore, MD. January 18, 2019.

10. **Aune KT.** Climate Change, Extreme Precipitation, and Influenza Risk in Maryland. Oral Presentation at: JHSPH EHE Doctoral Student Seminar. April 23, 2019.
9. **Aune KT**, Gesch DB, Smith GS. Associations between Flooding from Hurricane Katrina and Gentrification in Orleans Parish, Louisiana. Poster presentation at: World GIS Day Poster Session. Baltimore, MD. November 14,2018.
8. **Aune KT**. Epidemiology of Injuries in Extreme Conditioning Programs. Oral Presentation at: *University of Alabama at Birmingham, Physical Medicine & Rehabilitation Grand Rounds*. Birmingham, AL. February 13, 2015.
7. **Aune KT**. Risk Factors for Adolescent Pitchers. Oral Presentation at: *33rd Annual ASMI Injuries in Baseball Course*. Birmingham, AL. January 25, 2015.
6. **Aune KT**. Injuries in an Extreme Conditioning Program. Oral Presentation at: *2014 Alabama State Association for Physical Education, Recreation, and Dance Annual Meeting*. Birmingham, AL. November 17, 2014.
5. **Aune KT**. Designing your research project. Oral Presentation at: *American Sports Medicine Institute Weekly Conference*. Birmingham, AL. September 5, 2014.
4. **Aune KT**, Veselsky S, Arynchyna A, Bey A, Wellons J, Shannon C. Evaluating infection trends in pediatric neurosurgical patients: a multidisciplinary process improvement initiative. Oral Presentation at: *41st Annual Meeting of the American Association of Neurological Surgeons / Congress of Neurological Surgeons Section on Pediatric Neurological Surgery*. St. Louis, MO. November 27-30, 2012.
3. Veselsky S, **Aune KT**, Bey A, Arynchyna A, Shannon C, Wellons J. Evaluating infection trends in a pediatric acute care facility. Poster Presentation at: *41st Annual Meeting of the American Association of Neurological Surgeons / Congress of Neurological Surgeons Section on Pediatric Neurological Surgery*. St. Louis, MO. November 27-30, 2012.
2. Wellons J, **Aune KT**, Veselsky S. Update on infection issues. Oral Presentation at: *American Association of Neurological Surgeons / Congress of Neurological Surgeons Joint Section on Pediatric Neurosurgery*. Austin, TX. April 25, 2012.
1. **Aune KT**, Ramirez A, Veselsky S. Molecular buffering of dNPT metabolism by TOR signaling. Oral Presentation at: *University of Alabama at Birmingham, Cancer Research Experience for Students Research Meeting*. Birmingham, AL. July 2011.

INVITED LECTURES

5. **Aune KT.** Careers in Epidemiologic Research. Oral Presentation at: HLTH 435 – Introduction to Epidemiology; Towson University. Towson, MD. April 25, 2023.
4. **Aune KT.** Climate & Environmental Justice in Baltimore Panel. Session Moderation at JHU Climate & Justice Teach-In; Sustainable Hopkins Innovative Projects. Baltimore, MD. March 30, 2022.
3. **Aune KT.** Epidemiology of Injuries in Extreme Conditioning Programs. Oral Presentation at: EPI 603 - Injury-Epidemiologic Principles and Prevention Strategies; University of Alabama at Birmingham School of Public Health. Birmingham, AL. November 8, 2016.
2. **Aune KT.** Epidemiology of Injuries in Tennis-Teach Professionals: Surveillance Methods & Results. Oral Presentation at: EPI 603 - Injury-Epidemiologic Principles and Prevention Strategies; University of Alabama at Birmingham School of Public Health. Birmingham, AL. October 27, 2015.
1. **Aune KT.** Epidemiology of Injuries in Extreme Conditioning Programs. Oral Presentation at: EPI 603 - Injury-Epidemiologic Principles and Prevention Strategies; University of Alabama at Birmingham School of Public Health. Birmingham, AL. March 6, 2014.

TEACHING EXPERIENCE:

Johns Hopkins Bloomberg School of Public Health
- Environmental Justice and Public Health Practice (180.626.81), graduates, 2nd Term 2019-2021
- Spatial Analysis III: Spatial Statistics (140.698.01), graduates, 3rd Term 2020, 2021
- Spatial Analysis IV: Spatial Design and Application (140.699.01), graduates, 3rd Term 2020, 2021
- The Built Environment: Influences and Challenges to Improving Population Health (602.751.86), graduates, 3rd Term 2021
- The Global Environment, Climate Change, and Public Health (180.611.01), graduates, 1st Term 2018

Johns Hopkins University
- The Environment and Your Health (AS.280.335), undergraduates, Fall 2019 – Spring 2021

AWARDS & HONORS

- Delta Omega, Alpha Chapter 2023 - present
- NIH Training Program in Environmental Health Sciences Grant (T32ES007141) 2017 – present
- NIH Federal Traineeship in Public Health Grant 2010 – 2011

RESEARCH GRANT PARTICIPATION

Grant Title:	Shore Power and Air Quality at the Port of Baltimore (SPARQ)
Duration:	March 1, 2024 – November 30, 2024
Sponsoring Agency:	Johns Hopkins BREATHE Center (NIH/NIEHS P2CES033415)
Principal Investigator:	Kyle T. Aune and Kirsten Koehler
Funding Level:	$10,000
Major Goals:	This study will use fine spatiotemporal estimates of particulate matter (PM) concentrations from a network of low-cost air quality monitors already in place throughout the Baltimore region along with meteorological data to model PM pollution attributable to docked cruise vessels' positions as identified through U.S. Coast Guard marine transponder data.
Principal Responsibilities:	Aune: Principal Investigator

PROFESSIONAL MEMBERSHIPS & SERVICE

Surveillance Outbreak and Response Team (SORT) 2020 – present
Attended weekly meetings to review infectious disease topics locally, statewide, and globally. Led analysis of excess mortality during COVID-19 pandemic in Baltimore, MD using a mixed-effects, autoregressive Poisson model in R. Provided epidemiologic, biostatistical, geospatial, and statistical programming support to Baltimore City Health Department.

Johns Hopkins Public Health Student Forum 2019 – 2022
Undergraduate mentor

Environmental Health and Engineering Student Organization 2018 – 2019
Secretary

American Public Health Association 2017 – present

American Association for the Advancement of Science 2015 – present

Ad hoc reviewer for: *Biomedical and Environmental Sciences, Cities, Environmental Research, The Lancet Planetary Health*, *Urban Climate*

CERTIFICATIONS

CITI Human Subjects Research
CITI Human Subjects Research for Research Coordinators
CITI Good Clinical Practice
CITI Information Privacy and Security
CITI Health Privacy Issues for Researchers
NIH Protecting Human Research Participants

STUDENT RESEARCHER SUPERVISION

Supervised Starting in 2017:
- Dajah Staley; University of Alabama at Birmingham
- Christopher Curran; East Carolina University
- Craig Pille; Northeastern University
- Allie Andrews; Auburn University

Supervised Starting in 2016:
- Sanjay Reddy; University of Michigan
- Jorge Gonzalez; University of Miami

Supervised Starting in 2015:
- Leo Taarea; Philadelphia College of Osteopathic Medicine, Georgia Campus
- Aloiya Earl; University of Toledo College of Medicine and Life Sciences
- Ruben Tresgallo; University of Puerto Rico School of Medicine

Supervised Starting in 2013:
- Wil Gilmore; University of Alabama School of Medicine
- Monica Milanovich; Lafayette College
- Abhi Sharma; Emory University
- Tony Choi; Creighton University School of Medicine
- Travis Tubbs; University of Michigan
- Rebecca Ellis; University of Delaware
- Richard Royal; Medical University of South Carolina
- Bill Johnson; University of Alabama at Birmingham School of Public Health

- Jake Smith; University of Arkansas
- Connor Read; University of Alabama School of Medicine
- Mason McAnally; University of Alabama at Birmingham
- Riley Pashak; Grand Valley State University

Supervised Starting in 2014:

- Matt Biedelman; University of Alabama School of Medicine
- Evan McConnell; Clemson University
- Joe Kelling; Creighton University School of Medicine
- Kiran Kanwar; Logan University
- Kiley Mason; Allegheny College
- Stuart Hoyle; University of Alabama at Birmingham School of Public Health
- Meshark Okunbor; University of Alabama School of Medicine
- Jake Virgo; Rosalind Franklin University of Medicine and Science

Supervised Starting in 2012:

- Tim Evans; Creighton University School of Medicine
- Murphy Walters; Sewanee, University of the South
- Alex Smith; Auburn University
- Justin Silverman; Wilfrid Laurier University