

CONTACT INFORMATION	Institute for Health Metrics and Evaluation Population Health Building/Hans Rosling Center 3980 15th Ave NE, Seattle, WA 98195 USA UW Campus Box #351615 aeschuma@uw.edu	
EDUCATION	University of Washington , Seattle, WA <i>August 2022</i> PhD, Biostatistics Dissertation: “Modeling multivariate health and demographic outcomes in low- and middle-income countries using sample registration and complex survey data” Advisor: Jon Wakefield Committee: Tyler McCormick, Noah Simon, Haidong Wang, Jim Hughes University of California, San Diego , La Jolla, CA <i>June 2012</i> BS, Mathematics - Probability and Statistics Minors: Global Health, Psychology <i>Summa cum laude</i>	
PROFESSIONAL POSITIONS	University of Washington Assistant Professor <i>April 2024 –</i> <i>Department of Health Metrics Sciences, School of Medicine</i> Research Team Lead: Population, Fertility, and Mortality <i>September 2022 –</i> <i>Institute for Health Metrics and Evaluation</i> Faculty affiliate <i>November 2024 –</i> <i>Center for Statistics and the Social Sciences</i> Acting Assistant Professor <i>September 2022 – March 2024</i> <i>Department of Health Metrics Sciences, School of Medicine</i>	
TEACHING EXPERIENCE	Courses University of Washington HMS 512: Mortality Analysis for Health Metrics Sciences HMS 592: Health Metrics Sciences Seminar Workshops Institute for Health Metrics and Evaluation Mortality Methods in Health Metrics Workshop. Islamabad, Pakistan. Invited Lectures University of Washington PHRMRA 545: Statistical Topics For Biomedical Regulatory Affairs Professionals - Lecture 3: Basic Statistical Analysis - Lecture 4: Randomized Controlled Trials Mozambique Institute for Health Education and Research Global Burden of Disease in Mozambique. Maputo, Mozambique. Teaching Assistantships University of Washington BIOST 571: Advanced Regression Analysis for Dependent Data BIOST 555: Statistical Methods for Spatial Epidemiology BIOST 524: Design of Medical Studies BIOST 514/515: Biostatistics I/II BIOST 511/512/513: Medical Biometry I/II/III	

PHI 512: Analytic Skills for Public Health I
 PHRMRA 545: Statistical Topics For Biomedical Regulatory Affairs Professionals
 UCONJ 510: Introductory Laboratory Based Biostatistics
 SISMID 2020 Module 5: Spatial Statistics in Epidemiology and Public Health
 SISG 2020 Module 8: Bayesian Statistics for Genetics

HONORS AND AWARDS

National Institute of Health T32 Training Grant *May 2015 – May 2018*
 Biostatistics and Mental Health
 Advisor: Xiao-Hua (Andrew) Zhou
 Professor, Department of Biostatistics
 Adjunct Professor, Department of Psychiatry and Behavioral Science
 University of Washington

REFEREED JOURNAL PUBLICATIONS

First or senior authorship

1. **Schumacher AE**, Bhattacharjee NV, . . . , Murray CJL, Smith AE, Vollset SE (2024). Global fertility in 204 countries and territories, 1950–2021, with forecasts to 2100: a comprehensive demographic analysis for the Global Burden of Disease Study 2021. *The Lancet*. 403(10440): 2057-99.
2. **Schumacher AE**, Kyu HH, . . . , Lim SS, Murray CJL (2024). Global age-sex-specific mortality, life expectancy, and population estimates in 204 countries and territories and 811 subnational locations, 1950–2021, and the impact of the COVID-19 pandemic: a comprehensive demographic analysis for the Global Burden of Disease Study 2021. *The Lancet*. 403(10440): 1989-2056.
3. **Schumacher AE**, McCormick TH, Wakefield J, Chu Y, Perin J, Villavicencio F, Simon N, Liu L (2022). A flexible Bayesian framework to estimate age- and cause-specific child mortality over time from sample registration data. *The Annals of Applied Statistics*. 16(1): 124-43.

Other authorship

1. Steel N, **Schumacher AE**, . . . , Hay SI, Murray CJL (2025). Changing life expectancy in European countries 1990–2021: a subanalysis of causes and risk factors from the Global Burden of Disease Study 2021. *The Lancet*. To appear.
2. Comfort H, McHugh TA, **Schumacher AE**, Harris A, May EA, Paulson KR, Gardner WM, Fuller JE, Frisch ME, Taylor HJ, Leever AT, Teply C, Vergheze NA, . . . , Hay SI, Naghavi M, Murray CJL, Dandona R, Kassebaum NJ. (2024) Global, regional, and national stillbirths at 20 weeks’ gestation or longer in 204 countries and territories, 1990–2021: findings from the Global Burden of Disease Study 2021. *The Lancet*. 404(10466): 1955-88.
3. Wu AM, Cross M, Elliott JM, Culbreth GT, Haile LM, Steinmetz JD, Hagins H, Kopec JA, Brooks PM, Woolf AD, Kopansky-Giles DR, Walton DM, Treleaven JM, Dreinhoefer KE, Betteridge N, **Schumacher AE**, . . . , Ong KL, Vos T, March LM (2024). Global, regional, and national burden of neck pain, 1990–2020, and projections to 2050: a systematic analysis of the Global Burden of Disease Study 2021. *The Lancet Rheumatology*. 6(3): e142-55.
4. Thomson AM, McHugh TA, Oron AP, Teply C, Lonberg N, Tella VV, Wilner LB, Fuller K, Hagins H, **Schumacher AE**, . . . , Hay SI, Naghavi M, Murray CJL, Kassebaum NJ (2023). Global, regional, and national prevalence and mortality burden of sickle cell disease, 2000–2021: a systematic analysis from the Global Burden of Disease Study 2021. *The Lancet Haematology*. 10(8): e585-e599.

5. Mensah GA, Fuster V, Murray CJ, Roth GA, **Schumacher AE**, et al (2023). Global burden of cardiovascular diseases and risks, 1990-2022. *Journal of the American College of Cardiology*. 82(25):2350-473.
6. Gause EL, **Schumacher AE**, Ellyson AM, Withers SD, Mayer JD, Rowhani-Rahbar A (2024). An Introduction to Bayesian Spatial Smoothing Methods for Disease Mapping: Modeling County Firearm Suicide Mortality Rates. *American Journal of Epidemiology*. kwae005. doi:10.1093/aje/kwae005. *Epub ahead of print*. PMID:38375682.
7. Lozano R, Montoya A, Razo C, **Schumacher AE**, Comfort H, Pease S, et al (2023). Impacto de COVID-19 en la esperanza de vida en México. Un análisis basado en el estudio Global Burden of Disease 2021. *Gac Med Mex*. 159(6): 479-487. Available from: <http://dx.doi.org/10.24875/GMM.23000420>.
8. Bollyky TJ, Castro E, **Schumacher AE**, . . . , Murray CJL, Dieleman JL (2023). Assessing COVID-19 pandemic policies and behaviours and their economic and educational trade-offs across US states from Jan 1, 2020, to July 31, 2022: an observational analysis. *The Lancet*. 401(10385): 1341-1360.
9. Perin J, Chu Y, Villavicencio F, **Schumacher AE**, McCormick TH, Guillot M, Liu L (2022). Adapting and validating the log quadratic model to derive under-five age- and cause-specific mortality (U5ACSM): a preliminary analysis. *Population Health Metrics* 20(3): 1-12.
10. Lee PP, Guess GC, **Schumacher AE**, Dalley RW (2021). Delayed diagnosis of palatal adenoid cystic carcinoma: Review of diagnostic workup and image features of perineural spread. *Oral Oncology*. 2021 Oct;121:105501.
11. Bugg D, Bretherton R, Kim P, Olszewski E, Nagle A, **Schumacher AE**, Chu N, Gunaje J, DeForest C, Stevens K, Kim DH (2020). Infarct Collagen Topography Regulates Fibroblast Fate via p38-Yes-Associated Protein Transcriptional Enhanced Associate Domain Signals. *Circulation Research*, 127(10): 1306-22.
12. Mocumbi AO, Langa DC, Chicumbe S, **Schumacher AE**, Al-Delaimy WK (2019). Incorporating selected non-communicable diseases into facility-based surveillance systems from a resource-limited setting in Africa. *BMC Public Health*, 19(1): 147.
13. Guess GC, Dalley R, **Schumacher AE**, Lee PP (2019). Detection of perineural spread of palatal adenoid cystic carcinoma by CT. *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*. 128(4):e158.
14. Lee PP, Stanton A, **Schumacher AE**, Truelove E, Hollender LG (2019). Osteoarthritis of the TMJ and increase of the horizontal condylar angle. A longitudinal study. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology*, 127(4): 339-350.
15. Fullman N, Yearwood J, **Schumacher AE**, . . . , Christopher JL Murray, Rafael Lozano (2018). Measuring performance on the Healthcare Access and Quality Index for 195 countries and territories and selected subnational locations: a systematic analysis from the Global Burden of Disease Study 2016. *The Lancet*, 391(10136): 2236-71.
16. Wang Y, Li X, Zhou M, Luo S, Liang J, Liddell CA, Coates MM, Gao Y, Wang L, He C, Kang C, Liu S, Dai L, **Schumacher AE**, . . . , Zhu J, Murray CJL, Wang H (2016). Under-5 mortality in 2851 Chinese counties, 1996-2012: a subnational assessment of achieving MDG 4 goals in China. *The Lancet*, 387(10015): 273-283.

17. Newton JN, Briggs ADM, Murray CJL, Dicker D, Foreman KJ, Wang H, Naghavi M, Forouzanfar MH, Ohno SL, Barber RM, Vos T, Stanaway JD, Schmidt JC, Hughes AJ, Fay DFJ, Ecob R, Gresser C, McKee M, Rutter H, **Schumacher AE**, . . . , Davis ACJ (2015). Changes in health in England, with analysis by English regions and areas of deprivation, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 386(10010): 5-11.
18. Murray CJL, Barber RM, Foreman KJ, **Schumacher AE**, . . . , Saloman JA, Lopez AD, Vos T (2015). Global, regional, and national disability-adjusted life years (DALYs) for 306 diseases and injuries and healthy life expectancy (HALE) for 188 countries, 1990–2013: quantifying the epidemiological transition. *The Lancet*, 386(10009): 2145-2191.
19. Naghavi M, Wang H, Lozano R, Davis A, Liang X, Zhou M, Vollset SE, **Schumacher AE**, . . . , Vos T, Lopez AD, Murray CJL (2015). Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 385(9963): 117-171.
20. Wang H, Liddell CA, Coates MM, Mooney MD, Levitz CE, **Schumacher AE**, Apfel H, Iannarone M, Phillips B, Lofgren KT, Sandar L, Dorrington R, . . . , Vos T, Lopez AD, Murray CJL (2014). Global, regional, and national levels of neonatal, infant, and under-5 mortality during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 384(9947): 957-979.
21. Kassebaum NJ, Bertozzi-Villa A, Coggeshall MS, Shackelford KA, Steiner C, Heuton KR, Gonzalez-Medina D, Barber R, Huynh C, Dicker DJ, Templin T, Wolock TM, **Schumacher AE**, . . . , Lopez AD, Naghavi M, Murray CJL, Lozano R (2014). Global, regional, and national levels and causes of maternal mortality during 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 384(9947): 980-1004.
22. Wang H, **Schumacher AE**, Levitz CE, Mokdad AH, Murray CJL (2013). Left behind: Widening disparities for males and females in US county life expectancy, 1985-2010. *Population Health Metrics* 11(8): 1-15.
23. Levin-Rector A, Rajaratnam J, Wang H, **Schumacher AE**, Levitz CE, Murray CJL. Improved analysis of sibling survival data taking into account survivor bias, zerosurviving reporters and recall bias. *Mortality estimation for national populations: methods and applications*. University of Washington Press.

SUBMITTED
JOURNAL
PUBLICATIONS

1. **Schumacher AE**, Aravkin A, . . . , Murray CJL. Global age-sex-specific all-cause mortality and life expectancy estimates for 204 countries and territories and 660 subnational locations, 1950–2023: a comprehensive demographic analysis for the Global Burden of Disease Study 2023. *The Lancet*.
2. GBD 2021 Sepsis Collaborators. Global, regional, and national sepsis and infectious syndrome incidence and mortality, 1990–2021: analysis for the Global Burden of Disease Study. *The Lancet*.
3. Guess GC, Dalley R, **Schumacher AE**, Lee PP. Osseous changes associated with perineural spread of palatal adenoid cystic carcinoma can be reliably identified in CT. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology*.

PRESENTATIONS

1. **Schumacher AE**, Wakefield J (2023). Area- and unit-level models for small area estimation of multivariate outcomes using complex survey data in low- and middle-income countries. Population Association of America 2023 Annual Meeting. New Orleans, LA. April 2023.
2. **Schumacher AE**, McCormick TH, Wakefield J, Chu Y, Perin J, Liu L (2019). Bridging the CASM: Estimating Cause- and Age-Specific Mortality for Children in LMICs with the CASM-Child model. Population Association of America 2019 Annual Meeting. Austin, TX. April 2019.
3. **Schumacher AE**, McCormick TH, Wakefield J, Chu Y, Perin J, Liu L (2018). Bridging the CASM: Estimating Cause- and Age-Specific Mortality in Children with the CASM-Child model. University of Washington Department of Biostatistics Colloquium. Seattle, WA. November 2018.
4. **Schumacher AE**, McCormick TH, Wakefield J, Chu Y, Perin J, Liu L (2018). Bridging the CASM: Estimating Cause- and Age-Specific Mortality in Children for LMICs with the CASM-Child model (2018). Joint Statistical Meetings 2019. Vancouver, British Columbia, Canada. August 2018.
5. **Schumacher AE**, McCormick TH, Wakefield J, Chu Y, Perin J, Liu L (2018). Bridging the CASM: Estimating Cause- and Age-Specific Mortality for Children in Low- and Middle-Income Countries with the CASM-Child model. Geospatial Methods for Closing the Global Mortality Data Divide. Centre for Global Health Research. Toronto, Ontario, Canada. June 2018.
6. **Schumacher AE**, McCormick TH, Chu Y, Perin J, Liu L (2018). A Bayesian Hierarchical Multivariate Poisson-Lognormal Model to Estimate Age- and Cause-Specific Child Mortality in Data-Scarce Countries. University of Washington Department of Statistics Annual Student Poster Session. Seattle, WA. February 2018.
7. **Schumacher AE**, Zhou XH, Wang H (2016). A Statistical Framework for the Global Estimation of Child Mortality. University of Washington Department of Biostatistics Annual Student Poster Session. Seattle, WA. September 2016.
8. **Schumacher AE**, Ng M (2013). Finding the best cross-validation technique for modeling spatiotemporally correlated data: a simulation study. University of Washington Department of Biostatistics Annual Retreat. Leavenworth, WA. September 2013.
9. Levin-Rector A, Wang H, Rajaratnam JK, Levitz CE, **Schumacher AE**, Murray CJL (2013). Improved analysis of sibling survival data taking into account survivor bias, zero-surviving reporters and recall bias. IUSSP IPC XXVII. Busan, South Korea. August 2013.
10. **Schumacher AE**, Wang H, Lopez AD, Murray CJL (2013). Divergent trends in adult and elderly mortality for 21 regions and 187 countries, by sex, from 1970 to 2010: A systematic analysis. Global Health Metrics and Evaluation Conference. Seattle, WA. June 2013

COMPUTING SKILLS

Proficient in:
R, STATA, L^AT_EX, Microsoft Office Suite
Familiarity in:
Python, C, C++, UNIX, SQL, JMP

REFERENCES

Jon Wakefield

Email: jonno@uw.edu

Professor, Department of Biostatistics
Professor, Department of Statistics
University of Washington

Haidong Wang

Email: haidong@uw.edu

Unit Head, Monitoring, Forecasting and Inequalities
Division of Data, Analytics, and Delivery for Impact
World Health Organisation

Christopher JL Murray

Email: cjlm@uw.edu

Professor, Department of Health Metrics Sciences
Adjunct Professor, Department of Global Health
Chair, Department of Health Metrics Sciences
Adjunct Professor, Department of Health Services
Institute for Health Metrics and Evaluation
University of Washington