PERSONAL INFORMATION

Name: Ross Mathew Boyce
Address: 123 West Franklin Street, Suite 2151, Chapel Hill, NC 27516
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EDUCATION

July 2015 – June 2017	Fellowship, Infectious Diseases University of North Carolina School of Medicine, Chapel Hill, NC
July 2012 – June 2015	Internship & Residency, Internal Medicine Massachusetts General Hospital, Boston, MA
August 2006 – May 2012	Doctor of Medicine (M.D.) University of North Carolina School of Medicine, Chapel Hill, NC
September 2010 – May 2012	Masters of Science (M.Sc.), Public Health in Developing Countries London School of Hygiene and Tropical Medicine London, United Kingdom
August 1997 – June 2001	Bachelor of Science (B.S.) in Chemistry with Honors Davidson College, Davidson, NC

LICENSURE & CERTIFICATION

2017 - Present	Diplomate, American Board of Internal Medicine Certification in Infectious Diseases
2015 - Present	Diplomate, American Board of Internal Medicine Certification in Internal Medicine
2015 - Present	Medical License No: 2015-01104 North Carolina Medical Board

PROFESSIONAL EXPERIENCE

2021 – Present	Affiliate Faculty, Department of Biology Western Carolina University, Cullowhee, NC
2021 – Present	Faculty Fellow, Carolina Population Center University of North Carolina School of Medicine, Chapel Hill, NC
2021 – Present	Assistant Professor, Department of Epidemiology Gillings School of Global Public Health, Chapel Hill, NC
2019 – Present	Assistant Professor, Division of Infectious Diseases University of North Carolina School of Medicine, Chapel Hill, NC
2017 – 2019	Clinical Instructor, Division of Infectious Diseases University of North Carolina School of Medicine, Chapel Hill, NC
2009 – 2010	Civil-Military Officer

	1st Cavalry Division, United States Army, Mahmudiyah, Iraq
2004 – 2005	Reconnaissance Platoon Leader 1st Cavalry Division, United States Army, Baghdad, Iraq
2003 – 2004	Aide-de-Camp to the Assistant Division Commander 7th Infantry Division, United States Army, Fort Carson, CO
2002 – 2003	Rifle Platoon Leader 2nd Infantry Division, United States Army, Camp Casey, Republic of Korea

HONORS

2022	Jefferson Pilot Fellowship in Academic Medicine, UNC School of Medicine
2021	Doris Duke Charitable Foundation Clinician Scientist Development Award
2018	Best Clinical Article of the Year, *American Journal of Tropical Medicine & Hygiene*
2017	ASTMH/Bill & Melinda Gates Annual Travel Meeting Award
2016	Global Partnership Award, UNC Global
2016	Global Health Scholar, UNC School of Medicine
2015	First Prize, *International Journal of Epidemiology* Photo Essay Competition
2015	Elsevier Clinical Research Award, ASTMH Annual Meeting
2015	Outstanding Resident Research Award, MGH Internal Medicine
2012	The Merck Manual Award, UNC School of Medicine
2011	Okeke Prize & William Simpson Prize, London School of Hygiene & Tropical Medicine
2010	*Alpha Omega Alpha* Honor Society, UNC School of Medicine
2009	Bronze Star Medal, United States Army
2006	Fullerton Scholarship, UNC School of Medicine
2004	Bronze Star Medal with Valor Device United States Army
2002	Honor Graduate, Infantry Officer Basic Course, United States Army Infantry School
2001	*Phi Beta Kappa*, Davidson College
2001	James Baker Woods Award, Davidson College
2000	*Alpha Epsilon Delta* Premedical Honor Society, Davidson College
1993	Eagle Scout, Boy Scouts of America

BIBLIOGRAPHY AND PRODUCTS OF SCHOLARSHIP:

Refereed Papers/Articles:

1. Hollingsworth BD, Sandborn H, Baguma E, Ayebare E, Ntaro M, Mulogo EM, **Boyce RM**. Comparing field-collected versus remotely-sensed variables to model malaria risk in the highlands of western Uganda. *Malaria Journal.* In Press.

2. Abernathy HA, **Boyce RM**, Reiskind MH. Exploring the effects of caffeine on Aedes albopictus (Diptera: Culicidae) survival and fecundity. J Med Entomol. 2023. doi: 10.1093/jme/tjad047. PubMed PMID: 37085153.

3. **Boyce RM**, Cassidy C, Ndizeye R, Baguma E, Giandomenico DA, Shook-Sa BE, Ntaro M, Reyes R, Mulogo EM. Permethrin-treated baby wraps for the prevention of malaria in children: Protocol for a double-blind, randomized placebo-controlled controlled trial in western Uganda. *PLOS One*. In Press.

4. Shelus V, Mumbere N, Mulogo E, Barrington C, Baguma E, Muhindo R, Herrington JE, Emch M, Maman S, **Boyce RM**. Private sector antimalarial sales a decade after "Test and Treat. *Front Pub Health.* 2023. March 28; 11.doi: 10.3389/fpubh.2023.1140405

5. Sciaudone M, Cutshaw MK, McClean CM, Lacayo R, Kharabora O, Murray K, Strohminger S, Zivanovich MM, Gurnett R, Markmann AJ, Salgado EM, Bhowmik DR, Castro-Arroyo E, **Boyce RM**, Aiello AE, Richardson D, Juliano JJ, Bowman NM. Seroepidemiology and risk factors for SARS-CoV-2 infection among household members of food processing and farm workers in North Carolina. IJID Reg. 2023 Mar 22. doi: 10.1016/j.ijregi.2023.03.010. PMCID: PMC10032047.

6. Cassidy CA, Vias NP, Edwards J, Parker CN, **Boyce RM**, Aiello AE, Shook-Sa BE. Estimation of SARS-CoV-2 seroprevalence in central North Carolina: accounting for outcome misclassification in complex sample designs. *Epidemiology*. 2022. In Press.

7. **Boyce RM**, Ndizeye R, Ngelese H, Baguma E, Bwambale S, Rubinstein RJ, Lotspeich SC, Shook-Sa BE, Ntaro M, Nyehangane D, Wohl DA, Siedner MJ, Mulogo EM. It takes more than a machine: A pilot feasibility study of health systems capacity building for point-of-care HIV-1 viral load testing at a lower-level health center in rural western Uganda. *PLOS Global Public Health*. 2023 March 27; 3(3): e0001678. https://doi.org/10.1371/journal.pgph.0001678

8. **Boyce RM**, Schulz A, Mansour O, Giandomenico DA, Farel CE, Commins SP. Alpha-gal Syndrome in the Infectious Diseases Clinic: A series of five cases in central North Carolina. *Open Forum Infectious Diseases.* (Editor's Choice Selection). 2022; 9(12). doi: 10.1093/ofid/ofac663.

9. Shelus V, Mumbere N, Masereka A, Masika B, Kiitha J, Nyangoma G, Mulogo E, Barrington C, Baguma E, Muhindo R, Herrington JE, Emch M, Maman S, **Boyce RM**. "Testing for malaria does not cure any pain" A qualitative study exploring low use of malaria rapid diagnostic tests at drug shops in rural Uganda. *PLOS Glob Public Health* 2(12): e0001235. https://doi.org/10.1371/journal.pgph.0001235.

10. Abernathy H, Alejo A., Arahirwa V, Mansour O, Brown-Marusiak A, Giandomenico D, **Boyce RM**. "Leopards do not change their spots:" tick borne disease symptomology case report. *BMC Infect Dis* **22**, 699 (2022). https://doi.org/10.1186/s12879-022-07683-x.

11. Klein M, Sciaudone M, Richardson D, Lacayo R, McClean CM, Kharabora O, Murray K, Zinanovich MM, Strohminger S, Gurnett R, Markmann AJ, Bhowmik DR, Salgado EM, Castro-Arroyo E, Aiello AE, **Boyce RM**, Juliano JJ, Bowman NM. SARS-CoV-2 Seroprevalence and Risk Factors Among Meat Packing, Produce Processing, and Farm Workers. *PLOS Global Public Health*. 2022;2(7):e0000619. doi: 10.1371/journal.pgph.0000619.

12. Walekhwa AW, Musoke D, Nalugya A, Biribawa C, Nsereko G, Wafula ST, Nakazibwe B, Nantongo M, Odera DA, Chiara A, **Boyce RM**, Mulogo EM. Gaps in measles vaccination coverage in Kasese district, Western Uganda: results of a qualitative evaluation. *BMC Infect Dis*. 2022 Jul 4;22(1):589. doi: 10.1186/s12879-022-07579-w. PMID: 35787247.

13. Abernathy HA, Hollingsworth BD, Giandomenico DA, Moser KA, Juliano JJ, Bowman NM, George PJ, Reiskind MH, **Boyce RM**. Prevalence of Knock-Down Resistance F1534S Mutations in Aedes albopictus (Skuse) (Diptera: Culicidae) in North Carolina. *J Med Entomol*. 2022 May 29:tjac054. doi: 10.1093/jme/tjac054. Epub ahead of print. PMID: 35640258.

14. Lopez CA, Cunningham CH, Pugh S, Brandt K, Vanna UP, Delacruz MJ, Guerra Q, Bhowmik DR, Goldstein SJ, Hou YJ, Gearhart M, Wiethorn C, Pope C, Amditis C, Pruitt K, Newberry-Dillon C, Schmitz JL, Premkumar L, Adimora AA, Baric RS, Emch M, **Boyce RM**, Aiello AE, Fosdick BK, Larremore DB, de Silva AM, Juliano JJ, Markmann AJ. Ethnoracial Disparities in SARS-CoV-2 Seroprevalence in a Large Cohort of Individuals in Central North Carolina from April to December 2020. mSphere. 2022 May 19:e0084121. doi: 10.1128/msphere.00841-21. PMID: 35587682.

15. Brown Marusiak A, Hollingsworth BD, Abernathy H, Alejo A, Arahirwa V, Mansour O, Giandomenico D, Schmitz J, Williams C, Barbarin AM, **Boyce RM**. Patterns of Testing for Tick-Borne Diseases and

Implications for Surveillance in the Southeastern US. *JAMA Netw Open*. 2022;5(5):e2212334. Epub 2022/05/17. doi: 10.1001/jamanetworkopen.2022.12334.

16. **Boyce RM**. Destroying the village in order to save it: Collateral damage in the battle over Lyme disease. *Open Forum Infectious Diseases*. 2022 Mar 21. doi: 10.1093/ofid/ofac153.

17. Rosenstrom ET, Mele J, Ivy JS, Mayorga ME, Patel MD, Lich KH, Johnson K, Delamater P, Keskinocak P, **Boyce R**, Smith R, Swann JL, Can vaccine prioritization reduce disparities in COVID-19 burden for historically marginalized populations? *PNAS Nexus*. 2022 Mar 3; 1(1).pgab004, doi.org/10.1093/pnasnexus/pgab004.

18. **Boyce RM**, Muhindo E, Baguma E, Muhindo R, Shem B, François R, Hawke S, Shook-Sa BE, Ntaro M, Nalusaji A, Nyehangane D, Reyes R, Juliano JJ, Siedner MJ, Staedke SG, Mulogo EM. Permethrin-treated baby wraps for the prevention of malaria: results of a randomized controlled pilot study in rural Uganda. *Malar J.* 2022 Feb 23;21(1):63. doi: 10.1186/s12936-022-04086-w. PMID: 35197060.

19. Ciccone EJ, Kabugho L, Baguma E, Muhindo R, Juliano JJ, Mulogo EM, **Boyce RM**. Rapid diagnostic tests to guide case management of and improve antibiotic stewardship for pediatric acute respiratory illnesses in resource-constrained settings: a prospective cohort study in southwestern Uganda. *Microbiol Spectr*. 2021 Dec 22;9(3):e0169421. doi: 10.1128/Spectrum.01694-21. Epub 2021 Nov 24. PMID: 34817224.

20. Kim MK, Smedberg JR, **Boyce RM**, Miller MB. The Brief Case: "Great Pretender" – Disseminated Blastomycosis in Western North Carolina. *J Clin Micro*. 2021. Nov 18;59(12):e0304920. doi: 10.1128/JCM.03049-20. Epub 2021 Nov 18. PMID: 34792387.

21. Kim MK, Smedberg JR, **Boyce RM**, Miller MB. Closing the Brief Case: "Great Pretender"-Disseminated Blastomycosis in Western North Carolina. J Clin Microbiol. 2021 Nov 18;59(12):e0305620. doi: 10.1128/JCM.03056-20. Epub 2021 Nov 18. PMID: 34792390.

22. Miller EM, Law EA, Ajeen R, Karasik J, Mendoza C, Abernathy H, Garrett H, King E, Wallace J, Zelek M, Edwards JK, Xiong K, Beatty C, Fleischauer AT, Ciccone EJ, Shook-Sa BE, Aiello AE, **Boyce RM**. SARS-CoV-2 infection in central North Carolina: Protocol for a population-based longitudinal cohort study and preliminary participant results. *PLoS One*. 2021 Oct 25;16(10):e0259070. doi: 10.1371/journal.pone.0259070. PMID: 34695156.

23. **Boyce RM**, Hollingsworth BD, Baguma E, Xu, E, Goel V, Brown-Marusiak A, Muhindo R, Reyes R, Ntaro M, Siedner MJ, Staedke SG, Juliano JJ, Mulogo EM. Dihydroartemisinin-piperaquine chemoprevention and malaria incidence after severe flooding: evaluation of a pragmatic intervention in rural Uganda. *Clin Infect Dis*. 2021 Sep 9:ciab781. doi: 10.1093/cid/ciab781. PMID: 34499116.

24. Cote C, Goel V, Muhindo R, Baguma E, Ntaro M, Shook-Sa BE, Reyes R, Staedke SG, Mulogo EM, **Boyce, RM**. Malaria prevalence and long-lasting insecticidal net use in rural western Uganda: results of a cross-sectional survey conducted in an area of highly variable malaria transmission intensity. *Malar J.* 2021 Jul 5;20(1):304. doi: 10.1186/s12936-021-03835-7. PMID: 34225756

25. Gorret AM, Muhindo R, Baguma E, Ntaro M, Mulogo EM, Deutsch-Feldman M, Juliano JJ, Nyehangane D, Boyce RM. Comparison of capillary versus venous blood for the diagnosis of Plasmodium falciparum malaria using rapid diagnostic tests. J Infect Dis. 2021 Jul 2;224(1):109-113. doi: 10.1093/infdis/jiab032. PMID: 33502531.

26. Walekhawa WA, Ntaro M, Kawungezi PC, Achangwa C, Muhindo R, Baguma E, Matte M, Migisha R, Reyes R, Thompson P, **Boyce RM**, Mulogo EM. Measles outbreak in western Uganda: A case-control study. *BMC Infect Dis*. 2021 Jun 22;21(1):596. doi: 10.1186/s12879-021-06213-5. PMID: 34157990.

27. Cunningham C, Hennelly C, Lin J, Ubalee R, **Boyce R**M, Mulogo E, Hathaway N, Thwai KL, Phazu F, Kalonji A, Mwandagalirwa K, Tshefu A, Juliano JJ, Parr JB. A novel CRISPR-based malaria diagnostic capable of *Plasmodium* detection, speciation, and drug-resistance genotyping. *EBioMedicine.* 2021 Jun;68:103415. doi: 10.1016/j.ebiom.2021.103415. PMID: 34139428.

28. Patel MD, Rosenstrom E, Ivy JS, Mayorga ME, Keskinocak P, **Boyce RM**, Lich KH, Smith RL, Johnson KT, Delamater PD, Swann JL. Association of Simulated COVID-19 Vaccination and Nonpharmaceutical Interventions with Infections, Hospitalizations, and Mortality. *JAMA Netw Open.* 2021 Jun 1;4(6):e2110782. doi: 10.1001/jamanetworkopen.2021.10782. PMID: 34061203.

29. Brandt, K, Goel V, Keeler C, Bell GJ, Aiello AE, Corbie-Smith G, Wilson E, Fleischauer A, Emch M, **Boyce RM**. SARS-CoV-2 Testing in North Carolina: Racial, ethnic, and geographic disparities. *Health Place.* 2021 May;69:102576. doi: 10.1016/j.healthplace.2021.102576. PMID: 33915376.

30. Ciccone EJ, Zivich PN, Lodge EK, Zhu D, Law E, Miller E, Taylor JL, Chung S, Xu J, Volfovsky A, Beatty C, Abernathy H King E, Garret HE, Markmann AJ, Rebuli ME, Sellers. S, Weber DJ, Reyes R, Alavian N, Juliano JJ, **Boyce RM**, Aiello AE. SARS-CoV-2 infection in healthcare personnel and their household contacts at a tertiary academic medical center: Protocol for a longitudinal cohort study. *JMIR Res Protoc.* 2021 Apr 30;10(4):e25410. doi: 10.2196/25410. PMID: 33769944.

31. Root HB, **Boyce RM**, Robinson WR. Learning from LMICs: Best practices for leveraging sentinel surveillance systems to track the U.S. COVID-19 pandemic. *BMJ Glob Health*. 2020 Dec;5(12):e004685. doi: 10.1136/bmjgh-2020-004685. PMID: 33380417.

32. **Boyce RM,** Shook-Sa BE, Aiello AE. A tale of two studies: Study design and our understanding of SARS-CoV-2 seroprevalence. *Clin Infect Dis*. 2020 Dec 18:ciaa1868. doi: 10.1093/cid/ciaa1868. PMID: 33338219.

33. **Boyce RM**, Collins, MC, Muhindo R, Nakakande R, Ciccone EJ, Grounds S, Espinoza D, Zhu Y, Matte M, Ntaro M, Nyehangane D, Juliano J, Mulogo EM. Dengue in western Uganda: A prospective cohort of children presenting with undifferentiated febrile illness. *BMC Infect Dis*. 2020 Nov 11;20(1):835. doi: 10.1186/s12879-020-05568-5. PMID: 33176708.

34. Shook-Sa B, **Boyce RM**, Aiello AE. Estimation without Representation: Early SARS-CoV-2 Seroprevalence Studies and the Path Forward. *J Infect Dis*. 2020 Sep 1;222(7):1086-1089. doi: 10.1093/infdis/jiaa429. PMID: 32750135.

35. Hustedt J, **Boyce R**, Bradley J, Hii J, Alexander N. Use of pyriproxyfen in control of *Aedes* mosquitoes: a systematic review. *PLoS Negl Trop Dis*. 2020 Jun 12;14(6):e0008205. doi: 10.1371/journal.pntd.0008205. PMID: 32530915

36. **Boyce R,** Reyes R. Implementing and scaling verbal autopsies: into the unknown. *BMC Med*. 2020 Mar 9;18(1):53. doi: 10.1186/s12916-020-01527-8. PMID: 32146905.

37. **Boyce R**, Speight C, Lin J, et al. Errors in diagnostic test use and interpretation contribute to the high number of Lyme disease referrals in a low-incidence state*. Open Forum Infect Dis.* 2020 Jan 11;7(1):ofaa009. doi: 10.1093/ofid/ofaa009. PMID: 31988970.

38. **Boyce R**, Brazeau N, Fulton T, et al. Prevalence of molecular markers of antimalarial drug resistance across altitudinal transmission zones in highland Western Uganda. 2019 Oct;101(4):799-802. doi: 10.4269/ajtmh.19-0081. PMID: 31436149; PMCID: PMC6779209.

39. **Boyce RM,** Delamater P, Muhindo R *et al.* Accessible metrics of access: Novel tools to measure immunization coverage in rural sub-Saharan Africa. *Gates Open Res* 2019 Sep; **3**:1540. doi.org/10.12688/gatesopenres.13066.1 (No PMID).

40. Buhler C, Winkler V, Runge-Ranzinger S, **Boyce R**, Horstick, O. Environmental methods for dengue vector control – A systematic review and meta-analysis. *PLoS Negl Trop Dis*. 2019 Jul 11;13(7):e0007420. doi: 10.1371/journal.pntd.0007420. PMID: 31295250.

41. Nabukalu D, Ntaro M, Seviiri M, Reyes R, Wiens M, Sundarajan R, Mulogo E**, Boyce R.** Community health workers trained to conduct verbal autopsies provide better mortality measures than existing surveillance: Results from a cross-sectional study in rural western Uganda. *PLoS One*. 2019 Feb 13;14(2):e0211482. doi: 10.1371/journal.pone.0211482. PMID: 30759139.

42. Horstick, O, **Boyce, R**, Runge-Ranzinger, S. Building the evidence base for dengue vector control: Searching for certainty in an uncertain world. *Pathog Glob Health*. 2018 Dec;112(8):395-403. doi: 10.1080/20477724.2018.1547541. PMID: 30521408.

43. **Boyce, R**, Sanfilippo AM, Boulos JM, Cleinmark M, Schmitz, J, Meshnick S. *Ehrlichia* infections, North Carolina, USA, 2016. *Emerg Infect Dis*. 2018 Nov;24(11):2087-2090. doi: 10.3201/eid2411.180496. PMID: 30334725.

44. Chang JL, Reyes R, Matte M, Ntaro M, Mulogo E, Wiens MO, Meshnick SR, Siedner MJ, R Boyce. Who stays and who goes: Predictors of admission among patients presenting with febrile illness and a positive malaria rapid diagnostic test in a rural Uganda health center. Am J Trop Med Hyg. 2018 Oct;99(4):1080-1088. doi: 10.4269/ajtmh.18-0338. PMID: 30062988.

45. Wang LT, Bwambale R, Keeler C, Reyes R, Muhindo R, Matte M, Ntaro M, Mulogo E, Sundararajan R, **Boyce R**, 2018. Private sector drug shops frequently dispense parenteral anti-malarials in a rural region of Western Uganda. *Malar J*. 2018 Aug 22;17(1):305. doi: 10.1186/s12936-018-2454-7. PMID: 30134987.

46. **Boyce RM**, Hathaway N, Fulton T, Reyes R, Matte M, Ntaro M, Mulogo E, Waltmann A, Bailey JA, Siedner MJ, Juliano JJ. Reuse of malaria rapid diagnostic tests for amplicon deep sequencing to estimate Plasmodium falciparum transmission intensity in western Uganda. *Sci Rep*. 2018 Jul 5;8(1):10159. doi: 10.1038/s41598-018-28534-3. PMID: 29977002.

47. **Boyce, R**, Reyes, R, Keeler, C, Matte, M, Ntaro, M, Mulogo, E, Siedner, M. Anemia was an uncommon complication of severe malaria in a high-transmission, rural area of Western Uganda. *Am J Trop Med Hyg*. 2018 Mar;98(3):683-691. doi: 10.4269/ajtmh.17-0681. PMID: 29280423.

48. **Boyce, R**, Reyes, R, Matte, M, Ntaro, M, Mulogo, E, Siedner, M. Use of a dual-antigen rapid diagnostic test to screen children for severe P. falciparum malaria in a high-transmission, resource-limited setting. *Clin Infect Dis*. 2017 Oct 16;65(9):1509-1515. doi: 10.1093/cid/cix592. PMID: 29020298.

49. Samuel, M, Maoz, D, Manrique, P, Ward, T, Ranzinger, S, Toledo, S, **Boyce, R**, Horstick, O. Community Effectiveness of Indoor Residual Spraying as a Method: A Systemic Review. *PLoS Negl Trop Dis*. 2017 Aug 31;11(8):e0005837. doi: 10.1371/journal.pntd.0005837. PMID: 28859087.

50. Maoz, D, Ward, T, Moody, S, Runge Ranzinger, S, Toledo, J, **Boyce, R**, Horstick, O. Community Effectiveness of Pyriproxyfen as a Dengue Vector Control Method: A systematic review. *PLoS Negl Trop Dis*. 2017 Jul 17;11(7):e0005651. doi: 10.1371/journal.pntd.0005651. PMID: 28715426.

51. Ward, T., Samuel, M., Maoz, D., Runge-Ranzinger, S., **Boyce, R**., Toledo, J., Velayudhan, R. and Horstick, O. Dengue data and surveillance in Tanzania: A systematic literature review. *Trop Med Int Health.* 2017 Aug;22(8):960-970. doi: 10.1111/tmi.12903. PMID: 28556417.

52. Murungi, M, Fulton, T, Reyes, R, Matte, M, Ntaro, M, Mulogo, E, Juliano, J, Siedner, M, Boum, Y, **Boyce, R**. Improving the specificity of *P. falciparum* malaria diagnosis in high transmission settings with a two-step

RDT and microscopy algorithm. *J Clin Microbiol.* 2017 May;55(5):1540-1549. doi: 10.1128/JCM.00130-17. PMID: 28275077.

53. Horstick, O, **Boyce, R**, Runge-Ranzinger, S. Dengue vector control: Assessing what works. *Southeast Asian Journal of Tropical Medicine and Public Health.* 2017 Jan: 48(S1): 181-185. (No PMID)

54. Boyce, R, Reyes, R, Mulogo, E, Ntaro, M, Matte, Metlay J, Band, L, Siedner, M. Severe flooding and malaria transmission in a highland area of Uganda: Implications for disease control in an era of global climate change. J Infect Dis. 2016 Nov 1;214(9):1403-1410. doi: 10.1093/infdis/jiw363. PMID: 27534686.

55. Burgo-Black, A, Brown, J, **Boyce, R**, Hunt, S. The Importance of Taking a Military History. *Public Health Rep.* 2016 Sep;131(5):711-713. doi: 10.1177/0033354916660073. PMID: 28123212.

56. **Boyce, R**, Reyes, R, Mulogo, E, Ntaro, M, Matte, M, Lin, FC, Siedner, M. Practical implications of the non-linear relationship between test positivity rate and malaria incidence. *PLoS One*. 2016 Mar 28;11(3):e0152410. doi: 10.1371/journal.pone.0152410. PMID: 27018990.

57. **Boyce, R**, Reyes, R, Bwambale, S. The Health Centre Community. *Int J Epidemiol*. 2016 Feb;45(1):29-32. doi: 10.1093/ije/dyv371. PMID: 26971320.

58. **Boyce, R**, Mitton, J, Chu, J, Finn, K. South Sudan to Martha's Vineyard: Malaria. *Am J Med.* 2016 Feb;129(2):163-6. doi: 10.1016/j.amjmed.2015.08.030. PMID: 26394268.

59. **Boyce, R**, Reyes, R, Mulogo, E, Ntaro, M, Matte, M, Boum, Y, Siedner, M. Association between HRP - 2/pLDH rapid diagnostic test band positivity and malaria-related anemia at a peripheral health facility in Western Uganda. J Glob Health. 2015 Dec;5(2):020402. doi: 10.7189/jogh.05.020402. PMID: 26207181.

60. **Boyce, R**, Rosch R, Finlayson A, Handuleh D, Ahmed SW, Whitwell S, Leather A. Use of a bibliometric literature review to assess medical research capacity in post-conflict and developing countries: Somaliland 1991-2013. *Trop Med Int Health.* 2015 Nov;20(11):1507-1515. doi: 10.1111/tmi.12590. PMID: 26293701.

61. **Boyce, R**, Muiru, A, Reyes, R, Mulogo, E, Ntaro, M, Matte, M, Siedner, M. Impact of rapid diagnostic tests for the diagnosis and treatment of malaria at a peripheral health facility in Western Uganda: An interrupted time series analysis. *Malar J.* 2015 May 15;14:203. doi: 10.1186/s12936-015-0725-0. PMID: 25971788.

62. **Boyce, R.** The Forever War. *Ann Intern Med*. 2014 Nov 4;161(9):676-7. doi: 10.7326/M14-1054. PMID: 25364891.

63. **Boyce, R**, Lenhart, A, Kroeger, A, Velayudhan, R, Roberts, B, Horstick, O. *Bacillus thurengiensis irsraelensis* (Bti) for the control of Dengue vectors: systemic literature review. *Trop Med Int Health*. 2013 May;18(5):564-77. doi: 10.1111/tmi.12087. PMID: 23527785.

64. **Boyce, R.** Waiver of Consent: The Use of Pyridostigmine Bromide during the Persian Gulf War. *Journal of Military Ethics*. 2008 Mar: 8(1): 1-18. (No PMID).

*Names of mentored trainees underlined

In Press:

Under Review / Submitted:

1. Ciccone EJ, Zhu DR, Ajeen R, K. Lodge E, Shook-Sa BE, **Boyce RM**, Aiello AE. SARS-CoV-2 seropositivity after infection and antibody response to mRNA-based vaccination. *J Infect Dis.*

2. Zhang EY, Kalmath P, Abernathy HA, Giandomenico DA, Nolan MS, Reiskind MH, **Boyce RM**. *Rickettsia africae* infections in sub-Saharan Africa: A systematic literature review and descriptive analysis. *PLOS Neglected Diseases.*

3. Xu, E, Goel V, Baguma E Ayebare E, Hollingsworth BD, Brown-Marusiak A, Giandomenico D, Reyes R, Ntaro M, Ntaro M, Mulogo EM. **Boyce RM**. Evolution of spatiotemporal risk of malaria infection after severe flooding in rural western Uganda. *J Infect Dis*.

4. Arahirwa V, Tyrlik K, Abernathy H, Cassidy C, Alejo A, Mansour O, Brown-Marusiak A, **Boyce RM**. Impact of the COVID-19 pandemic on tick-borne disease diagnosis and clinical outcomes in North Carolina. *Emerg Infect Dis*.

Other Publications/Products:

1. **Boyce RM**. The Wildlife We Fear. In *Wildlife in North Carolina.* Vol 84(3). North Carolina Wildlife Resources Commission; 2020:3.

Invited Media Appearances

1. Pitofsky, Marina. "Researchers Warn of Tick-Borne Heartland Virus in US. What to Know about the Viral Pathogen." *USA Today*, 23 Mar. 2022, https://www.usatoday.com/story/news/health/2022/03/23/heartland-virus-warning-tick-removal/7134954001/.

2. **Boyce, RM**. Tickborne Ehrlichia in North Carolina. Emerging Infectious Diseases podcase. November 2018. Available at https://tools.cdc.gov/medialibrary/index.aspx#/media/id/393173.

TEACHING ACTIVITIES:

Course Director

2022 – Present Epidemiology 804 – Design of Clinical Research Studies Co-Instructor
The purpose of the course is to enable the participant to become familiar with the formulation of relevant clinical research questions, evaluation of study design options, considerations of analytic approaches and interpretation of results in clinical research studies.
MSCR Program 4 Credits

Lectures:

1. Boyce, R. Treatment of erythema migrans with doxycycline for 7 days versus 14 days in Slovenia: a randomised open-label non-inferiority trial. Lecturer for EPID 894: Infectious Diseases Epidemiology Seminar, UNC Department of Epidemiology. January 2023. Oral Presentation.

2. Boyce, R. Tick-Borne Diseases in North Carolina. Lecturer for Infectious Diseases Fellowship "Bootcamp." UNC Family Medicine Residency Program, UNC School of Medicine. August 10, 2022, 2022. Oral Presentation.

3. Boyce, R. Malaria Chemoprevention in the Post-discharge Management of Severe Anemia. Lecturer for EPID 894: Infectious Diseases Epidemiology Seminar, UNC Department of Epidemiology. March 2022. Oral Presentation.

4. Boyce, R. Ticks and Tick-Borne Diseases in North Carolina. Lecturer for GEOG 416: Applied Climatology, UNC Department of Geography. February 2022. Oral Presentation.

5. Boyce, R. Tick-Borne Diseases in North Carolina. Lecturer for Infectious Diseases Fellowship "Bootcamp." UNC Infectious Diseases Fellowship Training Program, UNC School of Medicine. July 2021, 2022. Oral Presentation.

6. Boyce, R. Geography as Destiny: Health Outcomes in Rural Uganda. HHV 280: Introduction to Global Health, Davidson College, Davidson NC, October 2020. Oral Presentation (Virtual).

7. Boyce, R. Use of Routine Data Sources in the Vector-Borne Disease Epidemiology, Ecology, and Response (VEER) Creativity Hub. Lecturer for EPID 795: Data in Public Health. UNC Gillings School of Global Public Health. September 2020. Oral Presentation (Virtual)

8. Boyce, R. Chatham County COVID-19 Cohort Study. Lecturer for Applied Epidemiology MPH Seminar. UNC Gillings School of Global Public Health. September 2020. Oral Presentation.

9. Boyce, R. Tick-Borne Diseases in North Carolina. Lecturer for Noon Conference. UNC Infectious Diseases Fellowship Training Program, UNC School of Medicine. April 2020. Oral Presentation.

10. Boyce, R. Tick-Borne Diseases in North Carolina. Lecturer for Noon Conference. UNC Internal Medicine Residency Program, UNC School of Medicine. February 2020, July 2020. Oral Presentation.

11. Boyce, R. Fever in the Returning Traveler. Lecturer for the Infectious Diseases Block. UNC Physician Assistant Program, UNC School of Medicine. July 2019-21. Oral Presentation.

12. Boyce, R. Bacterial Pathogens & Tick-Borne Infections. Lecturer for the EPI 799. UNC Gillings School of Global Public Health. September 2018. Oral Presentation.

13. Boyce, R. Principles and Ethics of Military Aid in Counterinsurgency Warfare. Guest Lecturer for the Applied Medical Anthropology Course. University College London. November 2010. Oral Presentation.

14. Boyce R. Counterinsurgency in Iraq. Guest Lecturer at the Insurgency and Counterinsurgency Course, Davidson College, June 2008. Oral Presentation.

Grand Rounds:

At UNC:

1. Boyce, R. Geography as Destiny: Malaria in the Highlands of western Uganda. Carolina Population Center Interdisciplinary Research Seminar, Chapel Hill, NC, April 2021. Oral Presentation.

2. Boyce, R. Chatham County COVID-19 Cohort. UNC Institute of Global Health and Infectious Diseases, Chapel Hill, NC, March 2021. Oral Presentation.

3. Boyce, R. Tick-Borne Diseases in North Carolina: the known and unknown unknowns. UNC Department of Medicine Grand Rounds, Chapel Hill, NC, February 2021. Oral Presentation.

4. Boyce, R. Geography as Destiny: Health Outcomes in Rural Uganda. UNC Institute of Global Health and Infectious Diseases, Chapel Hill, NC, September 2018. Oral Presentation.

Outside UNC:

1. Boyce, R. Tick-Borne Infections in North Carolina: The Known Unknowns. Greensboro Area Health Education Center (AHEC), Greensboro, NC, January 2022. Oral Presentation.

2. Boyce, R. Tick-Borne Infections in North Carolina: The Known Unknowns. Coastal Area Health Education Center (AHEC), Wilmington, NC, September 2017. Oral Presentation.

3. Boyce, R. Impact of rapid diagnostic tests for the diagnosis and treatment of malaria at a peripheral health facility in Western Uganda. Department of Medicine, Massachusetts General Hospital, Boston, May 2015. Oral Presentation

4. Boyce, R. Ghost Soldiers: Caring for Veterans Outside the VA. Department of Psychiatry, Jamaica Plain Veterans Affairs Hospital. Boston, October 2013. Oral Presentation

Continuing Education Lecture:

At UNC:

1. Boyce R. Tick-borne disease in NC: The Known Unknowns. UNC Physician Network "Lunch and Learn." April 2023. Oral Presentation.

2. Boyce R. Tick-borne disease in NC: The Known Unknowns. Immunology Department, McLendon Clinical Laboratories. November 2022. Oral Presentation.

3. Boyce, R. The Consult Commandments: Getting the Most from Your Consult. Department of Medicine Noon Conference, University of North Carolina at Chapel Hill, September 2017. Oral Presentation

4. Boyce, R. Ghost Soldiers: Caring for Veterans Outside the VA. Department of Family Medicine, University of North Carolina at Chapel Hill, November 2016. Oral Presentation

5. Harek S, Boyce R. Endgame Iraq. Guest Speaker for the Great Decisions Lecture Series hosted by the UNC Foreign Policy Association. University of North Carolina at Chapel Hill, March 2008. Oral Presentation.

Outside UNC:

1. Boyce, R. Tickborne Infections in North Carolina and the South. 47th Annual Internal Medicine Conference. March 15, 2023. Oral Presentation.

2. Boyce, R. Tickborne Ehrlichia in North Carolina. Emerging Infectious Diseases Podcast. Centers for Disease Control and Prevention. November 2018. Podcast.

3. Boyce, R. Ghost Soldiers: Caring for Veterans Outside the VA. Department of Medicine, Massachusetts General Hospital. Boston, December 2013. Oral Presentation

4. Boyce, R. The Laws of War. Guest Speaker for the President's Lecture Series. Davidson College, September 2008. Oral Presentation.

Research Mentorship:

2022 – Present	Peyton Pretsch, PhD Candidate, Epidemiology (Research Mentor) Project(s): - Spatiotemporal changes in prevalence of Lyme disease antibodies - Lyme knowledge, attitudes, and practices among clinicians *SE Center of Excellence for Vector-borne diseases PhD-ship University of North Carolina at Chapel Hill
2022 – Present	Haley Abernathy, PhD Candidate, Epidemiology (Research Mentor) Project(s): - Prevalence of TBD in NC populations *SE Center of Excellence for Vector-borne diseases PhD-ship

University of North Carolina at Chapel Hill

2022 – Present
Neha Mokashi, Honors Thesis (Research Mentor)
Project(s):
- Paging Clinicians for tick-borne disease results
- Spatiotemporal analysis of Lyme disease notifiable disease reports
*Summer Intern, Carolina Population Center
University of North Carolina at Chapel Hill

2022 – Present
Abigail Schulz, MD Candidate (Research Mentor)
Project: Risk of tick-borne disease exposure in suburban parks and greenways
*IDSA Grants for Emerging Researchers Mentorship (GERM) awardee
University of Illinois College of Medicine, Chicago, IL

2022 – Present
Mehal Churiwal (Research Mentor)
Project: Environmental risk of hydrocephalus in rural Uganda
*Fulbright Scholar
University of North Carolina at Chapel Hill

2022 – Present
Katherine Tyrlik, MPH Candidate (Research Mentor)
Project: Lyme disease in companion animals in western NC
*Mingma Norbu Sherpa Community Engagement Fellowship
UNC Gillings School of Global Public Health, Chapel Hill, NC

2021 – Present
Aidin Alejo, MD Candidate (Research Mentor)
Project: Association between travel burden and HIV care in rural Uganda
*IDSA Grants for Emerging Researchers Mentorship (GERM) awardee
UNC School of Medicine, Chapel Hill, NC

2021 – Present
Victor Arahiwa, MD Candidate (Research Mentor)
Project: Delays in Tick-Borne Disease due to the COVID-19 Pandemic
*Carolina Medical Student Research Program (CMSRP) awardee
*1st Prize, John B. Graham Medical Student Research Day
UNC School of Medicine, Chapel Hill, NC

2021 – 2022
Tiffany Rucker, MPH Candidate (Practicum Mentor)
Project: Needs assessment for Sickle Cell Disease in western Uganda
UNC Gillings School of Global Public Health, Chapel Hill, NC

2021 – Present
Joseph Davis, MS Candidate, Biology (Thesis Committee)
Project: Risk factors for LaCrosse Encephalitis in western North Carolina
Western Carolina University, Cullowhee, NC

2020 – Present
Brian Turigye, MPH Candidate
Project: Prevalence and risk of chronic Hepatitis B in rural Uganda.
Mbarara University of Science and Technology, Mbarara, Uganda

2019 – Present
Cate Hendren, MD Candidate (Research Mentor)
Project: Association between travel burden and HIV care in rural Uganda
*IDSA Grants for Emerging Researchers Mentorship (GERM) awardee
*Oral Presentation, ID Week, 2022
UNC School of Medicine, Chapel Hill, NC

2019 – Present
Erin Xu, MD Candidate (Research Mentor)

	Project: Impact of global climate change on *Anopheles* species distribution and density across altitudinal zones in the western Ugandan highlands * Benjamin H. Kean Travel Fellowship in Tropical Medicine awardee * Poster Presentation, Trop Med, 2022 UNC School of Medicine, Chapel Hill, NC
2018 – Present	Victoria Shelus, PhD Candidate (Thesis Advisor) – Health Behavior Project: Malaria case management practices at private-sector drug shops *Fulbright-Fogarty Fellow in Public Health (2020-21) UNC Gillings School of Global Public Health, Chapel Hill, NC
2020 – 2021	Nishma Vias, Senior Honors Thesis, Biostatistics (Thesis Committee) Project: Adaptation of the Rao-Wu rescaling bootstrap for seroprevalence estimation in complex survey studies University of North Carolina at Chapel Hill
2019 – 2021	Claire Cote, MPH Candidate (Practicum Mentor) Project: Distribution and condition of insecticide-treated nets in western Uganda UNC Gillings School of Global Public Health, Chapel Hill, NC
2019 – 2021	Abel Wilson, MPH Candidate Project: Measles outbreak investigation in rural western Uganda Mbarara University of Science and Technology, Mbarara, Uganda
2018 – 2021	Emily Ciccone, MD, MPH, Clinical Fellow, Division of Infectious Diseases Project: Stewardship for Acute Respiratory Illness *Thrasher Research Fund Early Career Award awardee *Burroughs Wellcome Fund-ASTMH Fellowship in Tropical Infectious Diseases Division of Infectious Diseases, UNC School of Medicine
2018 – 2020	Abalinda Gorrett, MSc Candidate – Laboratory Medicine Project: Peripheral vs. Venous Blood for Malaria Diagnosis Mbarara University of Science and Technology, Mbarara, Uganda
2018 – 2020	Regina Nakakende, MSc Candidate – Laboratory Medicine Project: Dengue as a cause of non-malarial febrile illness Mbarara University of Science and Technology, Mbarara, Uganda
2017 – 2018	Jonathan Chang, MPH Candidate (Practicum Mentor) Project: Predictors of admission at a rural Uganda health center *Awarded 2nd Place, 2018 ASTMH Elsevier Clinical Research Award UNC Gillings School of Global Public Health, Chapel Hill, NC
2017 – 2018	Lawrence Wang, MD Candidate Project: Antimalarial dispensing at private sector drug shops University of California at San Diego School of Medicine, San Diego, CA
2016 – 2018	Doreen Nabukulu, MPH Candidate Project: Using Community health workers to collect vital statistics in Uganda *Selected for Oral Presentation, 2018 CUGH Annual Meeting *WHO/TDR Grants for Implementation Research in Infectious Diseases of Poverty Mbarara University of Science and Technology, Mbarara, Uganda
2015 – 2016	Moses Murungi, MSc Candidate – Laboratory Medicine Project: Rapid diagnostic tests (RDTs) to identify severe malaria

Mbarara University of Science and Technology, Mbarara, Uganda

Clinical Teaching:

2020 – Present	Attending Physician General Infectious Diseases Consult Service
2018 – Present	Clinical Preceptor UNC Infectious Diseases Clinic

GRANTS:

Active Grants:

Title: La Crosse Encephalitis in western North Carolina: Epidemiology to elimination
Award: collab_254
Dates: 7/2022 – 6/2025
Source: NC Collaboratory
Role: PI
Amount: $217,913 Total Costs (2% FTE)

Title: Southeastern Center of Excellence for Vector-Borne Disease: Gateway Program
Award: U01CK000662
Dates: 7/2022 – 6/2027
Source: Centers for Disease Control and Prevention
Role: Site-PI
Amount: $211,870 Total Costs (2% FTE)

Title: Artemisinin Resistance in Africa: its emergence and evolution in Rwanda
Award: R01AI156267
Dates: 7/2021 – 6/2026
Source: National Institutes of Health/NIAID
Role: Co-PI (PI Bailey/Juliano/Mazarati)
Amount: $3,989,037 Total Costs (5% FTE)

Title: Getting Malaria "Off the Back" of women and children in western Uganda: A Phase III randomized control trial
Award: DD# 2021196
Dates: 7/2021 – 6/2024
Source: Doris Duke Charitable Foundation Clinical Scientist Development Award
Role: PI
Amount: $450,000 Direct Costs (10% FTE)

Title: From serial killers to mosquitos: The spatial targeting of mosquito breeding sites using geographic profiling
Award: K23AI141764
Dates: 12/2018 – 11/2022
Source: National Institutes of Health/NIAID
Role: PI
Amount: $951,770 (75% FTE)

Title: Vector-Borne Disease Epidemiology, Ecology, and Response (VEER) Creativity Hub
Dates: 7/2020 – 6/2022
Source: UNC Office of the Vice Chancellor of Research
Role: PI
Amount: $500,000 Direct Costs (0% FTE)

Title: Epidemiology and Laboratory Capacity Grant: Active surveillance of spotted fever group rickettsia and ehrlichia in central North Carolina
Award: Not assigned
Dates: 7/2021 - 6/2023
Source: Centers for Diseases Control and Prevention
Role: Site-PI
Amount: $323,000 Total Costs (2.5% FTE)

Completed Grants:

Title: Chatham County COVID Cohort Study (C4)
Dates: 6/2020 – 12/2022
Source: NC Department of Health and Human Services / Centers for Disease Control and Prevention
Role: PI
Amount: $1,600,000 Direct Costs (10% FTE)

Title: Emergence of pyrethroid resistance in response to permethrin-treated uniforms
Award: Not assigned
Dates: 1/2020 – 12/2022
Source: Triangle Center for Evolutionary Medicine (TriCEM)
Role: PI
Amount: $12,000 (0% FTE)

Title: Loan Repayment Program
Award: L30AI126495-04
Source: National Institutes of Health/NIAID
Dates: 7/2016 – 6/2022
Role: PI

Title: Vector or Victim: SARS-CoV-2 Infection in Healthcare Workers and Their Household Contacts
Dates: 6/2020 – 12/2021
Source: UNC Policy Collaboratory / Internal Funds / Private Donation
Role: Co-I (Aiello/Ciccone)
Amount: $579,000 Direct Costs (2% FTE)

Title: More than a machine: Exploring the ancillary systems and processes required to make point-of-care HIV-1 viral load testing effective in rural western Uganda
Award: P30AI050410
Dates: 8/2019 – 7/2021
Source: UNC Center for AIDS Research (CFAR)/NIAID
Role: PI
Amount: $30,000 (0% FTE)

Title: Getting malaria “off the back” of women and children in Uganda
Source: Conservation, Food, and Health Foundation
Dates: 1/2018 – 12/2020
Role: PI (Trainee)
Amount: $29,960 (0% FTE)

Title: Accessible metric of access: Novel tools to measure immunization coverage
Award: OPP1199232
Source: Bill & Melinda Gates Foundation
Dates: 11/2018 – 11/2020
Role: PI

Amount: $100,000 (5% FTE)

Title: Healthcare Worker Exposure Response and Outcomes of Hydroxychloroquine Trial (HERO-HCQ)
Award: COVID-19-2020-01
Dates: 4/2020 – 9/2020
Source: Patient-Centered Outcomes Research Institute (PCORI)
Role: Site-PI
Amount: $457,000 Direct Costs (20% FTE)

Title: Dengue as a cause of non-malarial febrile illness in western Uganda
Source: Takeda Vaccines - Investigator Initiated Sponsored Research
Dates: 7/2017 – 12/2019
Role: PI (Trainee)
Amount: $67,613 (0% FTE)

Title: Pathogenesis Training in Infectious Diseases
Award: T32 AI007151
Source: National Institutes of Health/NIAID
Dates: 7/2016 – 11/2018
Role: Post-doctoral trainee

Global Health Scholar Award
Source: UNC Office of International Activities
Dates: 7/2015 – 6/2017
Role: PI (Trainee)
Amount: $6,000 (0% FTE)

Small Grants for Implementation Research in Infectious Diseases of Poverty
Source: World Health Organization / Tropical Disease Research (TDR)
Dates: 7/2015 – 6/2017
Role: Co-Investigator / Research Mentor (Nabukulu - PI)
Amount: $15,000 (0% FTE)

Title: Rapid Diagnostic Tests for Severe Malaria
Project 13469
Source: Early Career Award, Thrasher Research Foundation
Dates: 9/2014 – 8/2016
Role: PI (Trainee)
Amount: $26,750 (0% FTE)

Title: Planning and Research Award
Source: Harvard Global Health Institute
Dates: 6/2014 – 12/2015
Role: PI (Trainee)
Amount: $25,000 (0% FTE)

Professional Service

- To Discipline:
    - Associate Editor, *BMC Infectious Diseases* (2020 – Present)
    - Associate Editor, *International Health* (2018 – 2020)
    - Journal Review (ad hoc):
        - *Acta Tropica*
        - *American Journal of Public Health*
        - *American Journal of Tropical Medicine and Hygiene*
        - *BMC Medicine*

        - *BMC Health Services Research*
        - *BMJ Global Health*
        - *Bulletin of the World Health Organization*
        - *Clinical Infectious Diseases*
        - *Clinical Microbiological Reviews*
        - *Geophysical Research Letters*
        - *Global Health Action*
        - *Journal of Global Health*
        - *Journal of Infectious Diseases*
        - *Lancet Global Health*
        - *Lancet Regional Health - Americas*
        - *Malaria Journal*
        - *PLOS Global Public Health*
        - *PLOS Neglected Tropical Diseases*
        - *PLOS One*
        - *Transactions of the Royal Society of Tropical Medicine and Hygiene*
        - *Wellcome Open Research*

    - Grant Review
        - American Society of Tropical Medicine and Hygiene, Benjamin H. Kean Travel Fellowship in Tropical Medicine Committee, 2023 – Present
        - Reviewer, NIH Center for Scientific Review, Conference Grants, December 2022
        - Canadian Institutes of Health Research, Tri-Agency Interdisciplinary - NSERC Discovery Horizons Committee, January 2022
        - U.S. Army Medical Research and Materiel Command (USAMRDC) Broad Agency Announcement, Medical Simulation and Information Sciences (MSIS) peer review panel, November 2021
        - Early Career Reviewer, NIH Center for Scientific Review, Vector Biology Study Section, October 2021
        - Peer-Reviewed Medical Research Program Congressional Directed Medical Research Program (CDMRP) peer review panel, May 2021, July 2022
        - Wellcome Trust International Training Fellowship, August 2020
        - Research for Health in Humanitarian Crises (R2HC), Call 7, January 2020
        - UJMT Fogarty Global Health Fellowship, January 2020, 2021
        - Wellcome Trust International Intermediate Fellowship, August 2019

- Within UNC-Chapel Hill
    - Advisory Board Member, UNC Africa Studies Center, 2019 – Present
    - Interviewer, UNC Division of Infectious Diseases Fellowship Program, 2018 – Present
    - Coordinator, "Not So Grand Rounds." UNC Division of Infectious Diseases, 2018 – 2020
    - Member, UNC Infectious Diseases Fellowship Program Evaluation Committee, 2016 - 2018

- Other
    - Invited Presenter, Tick-Borne Disease Working Group, U.S. Department of Health and Human Services, January 2022
    - Expert Medical Reviewer, North Carolina Medical Board, January 2020
    - Invited Participant, Department of Defense Congressionally Directed Medical Research Program (CDMRP) Stakeholder Meeting, Ft. Detrick, MD. March 25, 2019.
    - Invited Judge, AMR/Diagnostics Clinical Case Challenge, International Diagnostics Centre, London School of Hygiene and Tropical Medicine, April 2018
    - Joining Forces Initiative, Harvard Medical School, 2012 – 2014

Research Statement

I am a physician scientist who uses epidemiological tools to identify, evaluate, and disseminate practical and sustainable solutions to public health problems, especially those related to vector-borne diseases. My

overarching approach to these issues derives not only from advanced training in clinical infectious diseases and core public health methods, but is also informed by and grounded in meaningful "real world" experience in conflict zones and low-resource settings. Specifically, I am interested in leveraging accessible spatial analysis tools, simple diagnostic methods, and low-cost, targeted interventions to achieve improved health outcomes earlier in the care cascade, thus overcoming the well-documented structural barriers that limit access to tertiary referral centers. The majority of my research takes place in rural western Uganda – a region of highly heterogenous malaria transmission and frequent outbreaks of zoonotic and emerging infectious diseases. As a cornerstone of this work, I have established a mutually-respectful and growing research collaboration with academic partners at the Mbarara University of Science and Technology (MUST). Recently I have also started applying many of the same approaches and methods I use in Uganda to address the emerging, but largely neglected epidemic of tick-borne disease in the Southeastern United States with the long-term goal of developing a vibrant, interdisciplinary partnership between investigators at UNC and North Carolina State University. While early in my academic career, I have been relatively productive with 43 peer-reviewed publications through September 2021 with another four currently submitted or under review. My publications include original research articles in *Clinical Infectious Diseases* (2), *Emerging Infectious Diseases*, *The Journal of Infectious Diseases* (2), *PLOS Neglected Tropical Diseases* (4) and the *American Journal of Tropical Medicine and Hygiene* (3), among others. I have maintained consistent external funding dating back to 2014 when I was a medical resident. Specific themes of my work, include:

Elucidating the spatial epidemiology of malaria in an era of global climate change: Much of my early work was motivated by an urgent need to establish local priorities in regard to malaria prevention and control at our partner site in the highlands of western Uganda. Since then, we have employed a variety of methods to achieve this goal, including novel uses of existing tools such as rapid diagnostic tests and dried blood spots. We have also leveraged these approaches to examine the impact of severe precipitation and flooding on malaria transmission. This study, which has been cited twenty-six times since publication in 2016, was accompanied by an editorial in the *Journal of Infectious Diseases* emphasizing the potential for global climate to influence vector-borne disease transmission.

Novel Strategies for Malaria Control in sub-Saharan Africa: Over the past two decades, the burden of *Plasmodium falciparum* malaria-related mortality in SSA has decreased by more than 35%. Yet current strategies are insufficient to drive vectorial capacity below the critical thresholds needed to interrupt transmission. Thus, innovations in vector control are urgently needed. As part of my NIH career development award (K23AI141764), I am exploring the utility of a novel spatial analysis tool, geographic profiling (GP), to more efficiently locate mosquito breeding sites. GP uses the location of incident malaria cases to narrow the search area for breeding sites, thus reducing the time and effort required to conduct larval control programs.

In another effort to reduce interactions between humans and mosquito vectors, I am leading a randomized controlled trial of insecticide-treated *lesus*, which are the swathes of cloth used by women to carry infants on their back funded by a Clinical Scientist Develop Award from Doris Duke Charitable Foundation – the first at UNC in more than a decade. Our hypothesis is that with many malaria vectors adapting outdoor feeding behaviors in response to the widespread deployment of bed nets, an additional layer of protection could be achieved through the application of permethrin to the *lesus*.

Understanding and reducing the burden of tick-borne disease: North Carolina lies at the crossroads of an emerging tick-borne disease epidemic that will only be exacerbated by the effects global climate change. Despite a relatively high burden of disease, there are large gaps in our knowledge of disease risk, transmission, and pathogenesis. With the support of a Creativity Hub Award from the UNC Office of the Vice Chancellor for Research, I have assembled a trans-disciplinary, multi-institutional collaboration including physicians, epidemiologists, veterinarians, entomologists, and medical geographers that is pursuing multiple avenues of investigation to better define the clinical and spatial epidemiology of tick-borne disease, while also developing novel, evidence-based intervention to prevent and treat these neglected diseases. The research complements my clinical work in the UNC Infectious Diseases Clinic, which will eventually provide opportunities for patients to enroll in prospective studies.

Teaching Statement

While I am relatively early in my professional career, I have deliberately pursued opportunities to mentor students and trainees, which I consider to be one of the most important responsibilities and rewarding experiences of my academic appointment. I am particularly committed to supporting students and trainees at my partner institution in Uganda, who do not always have access to engaged mentors and are frequently

expected to pay the costs of their research projects. In recognition of my efforts, I received an appointment as a Visiting Associate Professor in the MUST Department of Community Health. I am also very excited about expanding my mentorship role with graduate students in the Department of Epidemiology and the Carolina Population Center. Specific elements are addressed in more detail below:

Didactic Instruction: I have taught in the classroom setting across the health professional schools including lectures in the Gillings School of Global Public Health (EPID 795 and 799) and the School of Medicine, (Infectious Diseases Fellowship, Internal Medicine Residency and the Physician Assistant Programs). My approach to didactic instruction is to provide clear learning objectives and, to the extent possible, practical application of the materials to real world problems, while also attempting to highlight limitations. I am very interested in opportunities to participate in inter-disciplinary instruction that may bring together course leaders from a variety of fields including clinical and veterinary medicine, epidemiology, entomology, and geography in what is essentially a "One Health" approach to teaching about communicable diseases.

Research and Professional Mentorship: Having spent five years of my life as an infantry officer in the United States Army, including two combat tours in Iraq, my philosophical approach to mentorship is to set high standards, provide direct support, when necessary, but allow the utmost independence and responsibility as appropriate to the individual's level of training. I take seriously the axiom from T.E. Lawrence, "Do not try to do too much with your own hands. Better [they] do it tolerably than you do it perfectly," and having stumbled many times in my own life, recognize the value of learning from mistakes and adapting, especially in the challenging and ever-evolving field of global health research. In my experience, I have found that when provided with this type of mentorship, students far exceed my expectations.

I attempt to guide trainees towards meaningful projects that form a key component of my own research portfolio, which means I am highly invested in the success of the work. Our emerging partnership in Uganda has generally allowed trainees to assume more responsibility and tackle independent projects that may not be possible in more established programs. Without exception, these students have successfully completed their projects and published their results of their work, typically as first authors, in peer-reviewed journals. A number have also received specialty society grants and awards including two travel grants and two conference awards from the American Society of Tropical Medicine and Hygiene, two summer research grants from the Infectious Diseases Society of America, a Burroughs-Wellcome Fund Award, and a Fulbright-Fogarty Fellowship in Public Health.

Precepting / Clinical Instruction: During the first two years of my faculty appointment in the Department of Medicine, I served as the outpatient clinic preceptor for a second-year infectious diseases fellow. Due to the increasing specialization of my outpatient clinic (e.g., tick-borne disease consultations), I have recently stepped down from this role. However, I continue to provide supervision of trainees and mid-level providers on an *ad hoc* basis. In addition, I spend 2-4 weeks each year attending on the General Infectious Diseases Consult Service, where I have the opportunity to teach first- and second-year fellows.

Diversity, Equity, and Inclusion Statement

As a researcher working in the fields of global health and tropical medicine, both of which have historical ties to colonialism, I am keenly aware of and highly sensitive to issues of representation and the power imbalances that can emerge when working with vulnerable populations in low- and middle-income settings. I have been intentional in my desire to mentor and support junior faculty, trainees, and students at our partner site in western Uganda. To date, I have mentored six graduate students from the Departments of Community Health and Laboratory Medicine at the Mbarara University of Science and Technology. Most of these students have carried out projects in conjunction with ongoing research projects, but in at least two cases, I have supported Ugandan-led research with discretionary funds. Each of these scholarly projects has resulted in a peer-reviewed publication, most with Ugandan trainees as first-author. In recognition this work, I received an appointment as a Visiting Associate Professor in the MUST Department of Community Health.

I am similarly committed to ensuring opportunities for students and trainees at UNC and our partner institutions in the Research Triangle. Again, working in fields such as global health and vector-borne diseases that have traditionally been dominated by men – and more specifically white men - I am intentional in my efforts to recruit, mentor, and retain talented individuals from historically under-represented and disadvantaged populations. Specific examples are outlined below:

For the past three years, I have enthusiastically participated in the university work-study program, which provides funds to low-income students, by offering research-based experiences in our laboratory. To date, I have supported six undergraduate work-study students, including one who is in her third year with our

group. These students not only earn a salary, but as full members of our team, gain valuable exposure to and firsthand experience with research.

While I cannot directly influence who approaches me for research mentorship, I take pride in the fact that the majority of the trainees and students I have mentored have been women. I am especially proud that these talented women have been incredibly successful, having received highly competitive awards such as the Burroughs Wellcome Fund-ASTMH Postdoctoral Fellowship in Tropical Infectious Diseases and the Fulbright-Fogarty Fellowship in Public Health. I attribute this success mostly to the motivation and ability of the individual students and trainees, but also believe that I have established an environment where they feel safe, supported, and challenged.

Lastly, I am in the early stages of working with partners at historically black colleges and university (HBCU) and other minority serving institutions (MSI) to develop a formal program (i.e., NIH R25) to increase exposure to the fields of global health and vector-borne diseases. My long-term goal is to leverage the resources available through our leading research programs both in Uganda and North Carolina to increase diversity and representation in these fields.