

Kilimanjaro Christian Medical Centre-
Duke University Health Collaboration
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Matthew P. Rubach, M.D.

Education

University of Arizona College of Medicine

Doctor of Medicine

Dean of Students: Christopher Leadem, Ph.D.

Tucson, AZ

May 2007

Princeton University

Bachelor of Arts, Public & International Affairs (*cum Laude*)

Certificate in Latin American Studies

Senior Thesis Advisor: Burton Singer, Ph.D.

Thesis: International Migration and Public Health: Tuberculosis Along the U.S.- Mexico Border

Princeton, NJ

June 2002

Position & Training

Duke University

Associate Professor

Department of Medicine

Division of Infectious Diseases & International Health

Associate Research Professor

Duke Global Health Institute

Durham, NC

September 2019–Present

Co-Director

Kilimanjaro Christian Medical Centre (KCMC)-Duke Health Collaboration

November 2015–Present

Medical Director

KCMC-Duke Health Collaboration Clinical Research Laboratory

November 2015–Present

Assistant Professor

Department of Medicine

Division of Infectious Diseases & International Health

Assistant Research Professor

Duke Global Health Institute

July 2015–August 2019

Kilimanjaro Christian Medical Centre

Consultant Doctor

Department of Internal Medicine

Moshi, Tanzania

November 2015–Present

Duke-NUS Medical School
Adjunct Associate Research Professor
Programme in Emerging Infectious Diseases

Singapore
January 2020–Present

Adjunct Assistant Research Professor
Programme in Emerging Infectious Diseases

February 2017–Dec 2019

Prior Positions & Training:

University of Utah
Medical Microbiology Fellow
Department of Pathology

Salt Lake City, UT
July 2014 – June 2015

KCMC-Duke University Health Collaboration
Research Fellow
Impacts of Bacterial Zoonoses Project

Moshi, Tanzania
August 2012 – June 2014

Duke University
Infectious Diseases Fellow
Department of Medicine
Division of Infectious Diseases & International Health

Durham, NC
July 2011 – June 2014

University of Utah
Medical Intern and Resident
Departments of Internal Medicine and Pediatrics

Salt Lake City, UT
June 2007 – June 2011

Board Certification

American Board of Pathology, Medical Microbiology
American Board of Internal Medicine, Infectious Diseases
American Board of Pediatrics
American Board of Internal Medicine

September 2015
October 2014
October 2011
August 2011

Licensure

North Carolina Medical Board
Medical Council of Tanganyika (#5192)
Utah Office of Occupational & Professional Licensing

July 2011–Present
November 2012–Present
January 2009–January 2016

Professional Societies

Member, American Society of Tropical Medicine & Hygiene
Member, American College of Physicians
Member, Infectious Diseases Society of America
Fellow, American College of Physicians
Fellow, Infectious Diseases Society of America

2009–Present
2011–2020
2013–2020
2020-Present
2020-Present

Career Goal

My goal is to conduct high-quality infectious disease clinical and epidemiologic research in resource-limited settings. My main research interest is the epidemiology and etiologies of severe infections, including efforts to improve diagnostic capacity and efforts that utilize one health approaches to study zoonotic infections. Ultimately, I hope that such research can inform clinical management algorithms and disease prevention priorities in resource-limited settings.

Publications (40 in Total)

Rubach MP, Mukemba JP, Florence SM, Lopansri BK, Hyland K, Simmons RA, Langelier C, Nakielny S, DeRisi JL, Yeo TW, Anstey NM, Weinberg JB, Mwaikambo ED, Granger DL. Cerebrospinal fluid pterins, pterin-dependent neurotransmitters, and mortality in pediatric cerebral malaria. *Journal of Infectious Diseases* 2021; *online ahead of print*. PMID: 33617646.

Lukambagire AS, Medes AJ, Bodenham RF, McGiven JA, Mkenda NA, Mathew C, **Rubach MP**, Sakasaka P, Shayo DD, Maro VP, Shirima GM, Thomas KM, Kasanga CJ, Kazwala RR, Halliday JEB, Mmbaga BT. Performance characteristics and costs of serological tests for brucellosis in a pastoralist community of northern Tanzania. *Scientific Reports* 2021;11:5480. PMID: 33750848 PMCID: PMC7943594.

Maze MJ, Elrod MG, Biggs HM, Bonnewell J, Carugati M, Hoffmaster AR, Lwezaula BF, Madut DB, Maro VP, Mmbaga BT, Morrissey AB, Saganda W, Sakasaka P, **Rubach MP**, Crump JA. Investigation of Melioidosis Using Blood Culture and Indirect Hemagglutination Assay Serology among Patients with Fever, Northern Tanzania. *American Journal of Tropical Medicine and Hygiene* 2020;103:2510-2514. PMID: 32996455 PMCID: PMC7695086.

Blum LS, Karia FP, Msoka EF, Oshosen Mwanga M, Crump JA, **Rubach MP**. An In-Depth Examination of Reasons for Autopsy Acceptance and Refusal in Northern Tanzania. *American Journal of Tropical Medicine and Hygiene* 2020;103:1670-1680. PMID: 32748779 PMCID: PMC7543794.

Allan KJ, Maze MJ, Galloway RL, **Rubach MP**, Biggs HM, Halliday JEB, Cleaveland S, Saganda W, Lwezaula BF, Kazwala RR, Mmbaga BT, Maro VP, Crump JA. Molecular Detection and Typing of Pathogenic *Leptospira* in Febrile Patients and Phylogenetic Comparison with *Leptospira* Detected among Animals in Tanzania. *American Journal of Tropical Medicine and Hygiene*. 2020;103:1427-1434. PMID: 32748767 PMCID: PMC7543812.

Maze MJ, Sharples KJ, Allan KJ, Biggs HM, Cash-Goldwasser S, Galloway RL, de Glanville WA, Halliday JEB, Kazwala RR, Kibona TT, Mmbaga BT, Maro VP, **Rubach MP**, Cleaveland S, Crump JA. Estimating Acute Human Leptospirosis Incidence in Northern Tanzania Using Sentinel Site and Community Behavioural Surveillance. *Zoonoses and Public Health* 2020;67:496-505. PMID: 32374085 PMCID: PMC7497209.

Poster presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, New Orleans, LA (October 2018).

Snaveley ME, Oshosen M, Msoka EF, Karia FP, Maze MJ, Blum LS, **Rubach MP**, Mmbaga BT, Maro VP, Crump JA, Muiruri C. "If You Have No Money, You Might Die": A Qualitative Study of

Sociocultural and Health System Barriers to Care for Decedent Febrile Inpatients in Northern Tanzania. *American Journal of Tropical Medicine and Hygiene* 2020;103:494-500. PMID: 32314691 PMCID: PMC7356475.

Bodenham RF, Lukambagire AHS, Ashford RT, Buza JJ, Cash-Goldwasser S, Crump JA, Kazwala RR, Maro VP, McGiven J, Mkenda N, Mmbaga BT, **Rubach MP**, Sakasaka P, Shirima GM, Swai ES, Thomas KM, Whatmore AM, Haydon DT, Halliday JEB. Prevalence and Speciation of Brucellosis in Febrile Patients From a Pastoralist Community of Tanzania. *Scientific Reports* 2020;10:7081. PMID: 32341414. PMCID: PMC7184621.

Althaus T, Lubell Y, Maro VP, Mmbaga BT, Lwezaula B, Halleux C, Biggs HM, Galloway RL, Stoddard RA, Perniciaro JL, Nicholson WL, Doyle K, Olliaro P, Crump JA, **Rubach MP**. Sensitivity of C-reactive protein for the identification of patients with laboratory-confirmed bacterial infections in northern Tanzania. *Tropical Medicine and International Health* 2020;25:291-300. PMID: 31808588 PMCID: PMC7265697.

Poster presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, Baltimore, MD (November 2017).

Halliday JEB, Carugati M, Snavely M, Allan K, Beamesderfer J, Ladbury G, Hoyle DV, Holland P, Crump JA, Cleaveland S, **Rubach MP**. Zoonotic causes of febrile illness in malaria endemic countries: a systematic review. *Lancet Infectious Diseases* 2020;20:e27-e37. PMID: 31808588 PMCID: PMC7212085.

Marchello CS, Dale AP, Pisharody S, **Rubach MP**, Crump JA. Prevalence of community-acquired bloodstream infections among hospitalized patients in Africa and Asia: a systematic review and meta-analysis. *Antimicrobial Agents and Chemotherapy* 2019;64:e01974-19. PMID: 31636071 PMCID: PMC7187598.

Madut DB, **Rubach MP**, Kalengo N, Carugati M, Maze MJ, Morrissey AB, Mmbaga BT, Lwezaula BF, Kilonzo KG, Maro VP, Crump JA. A prospective study of *Escherichia coli* bloodstream infection among adolescents and adults in northern Tanzania. *Transactions of the Royal Society of Tropical Medicine Hygiene* 2020;114:378-384. PMID: 31820810 PMCID: PMC7197297.

Poster presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, New Orleans, LA (October 2018).

Hertz JT, Madut DB, William G, Maro VP, Crump JA, **Rubach MP**. Perceptions of Stroke and Associated Health-Care-Seeking Behaviour in Northern Tanzania: A Community-Based Study. *Neuroepidemiology* 2019;53:41-47. PMID: 30986785 PMCID: PMC6842572.

Rubach MP, Zhang H, Florence SM, Mukemba JP, Kalingonji AR, Anstey NM, Yeo TW, Lopansri BK, Thompson JW, Mwaikambo ED, Young S, Millington DS, Weinberg JB, Granger DL. Kinetic and cross-sectional studies on the genesis of hypoargininemia in severe pediatric falciparum malaria. *Infection and Immunity* 2019; 87:e00655-18. PMID: 30718287 PMCID: PMC6434111.

Platform presentation of these results at the American Society of Tropical Medicine and Hygiene Annual Meeting, Philadelphia, PA (October 2015).

Hertz JT, Madut DB, Tesha RA, William G, Simmons RA, Galson SW, Sakita FM, Maro VP, Bloomfield GS, Crump JA, **Rubach MP**. Perceptions of chest pain and healthcare seeking behaviour for chest pain in northern Tanzania: a community-based survey. *PLoS One* 2019;14:e0212139. PMID: 30753216 PMCID: PMC6372176.

Hertz JT, Madut DB, Tesha RA, William G, Simmons RA, Galson SW, Sakita FM, Maro VP, Bloomfield GS, Crump JA, **Rubach MP**. Knowledge of myocardial infarction symptoms and perceptions of self-risk in Tanzania. *American Heart Journal* 2019;210:69-74. PMID: 30743209 PMCID: PMC6453561.

Hertz JT, Madut DB, Tesha RA, William G, Simmons RA, Galson SW, Maro VP, Crump JA, **Rubach MP**. Self-medication with non-prescribed pharmaceutical agents in an area of low malaria transmission in northern Tanzania: a community-based survey. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 2019;113:183-188. PMID: 30597114 PMCID: PMC6432801.

Maze MJ, Sharples KJ, Allan KJ, **Rubach MP**, Crump JA. Diagnostic accuracy of leptospirosis whole-cell lateral flow assays: a systematic review and meta-analysis. *Clinical Microbiology and Infection* 2019;25:437-444. PMID: 30472422 PMCID: PMC6456420.

Carugati M, Zhang HL, Kilonzo KG, Maze MJ, Maro VP, **Rubach MP**, Crump JA. Predicting mortality for adolescent and adult patients with fever in resource-limited settings. *American Journal of Tropical Medicine and Hygiene* 2018; 99:1246-1254. PMID: 30226134 PMCID: PMC6221229.

Poster presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, Baltimore, MD (November 2017).

Maze MJ, Cash-Goldwasser S, **Rubach MP**, Biggs HM, Galloway RL, Sharples KJ, Allan KJ, Halliday JEB, Cleaveland S, Shand MC, Muiruri C, Kazwala RR, Saganda W, Lwezaula BF, Mmbaga BT, Maro VP, Crump JA. Risk factors for acute leptospirosis in northern Tanzania. *PLoS Neglected Tropical Diseases* 2018;12:e0006372. PMID: 29879114 PMCID: PMC5991637.

Platform presentation of these results by Michael Maze at the American Society of Tropical Medicine and Hygiene Annual Meeting, Atlanta, GA (November 2016).

Carugati M, Biggs HM, Maze MJ, Stoddard RA, Cash-Goldwasser S, Hertz JT, Halliday JEB, Saganda W, Lwezaula BF, Kazwala RR, Cleaveland S, Maro VP, **Rubach MP**, Crump JA. Incidence of human brucellosis in the Kilimanjaro Region of Tanzania in the periods of 2007-2008 and 2012-2014. *Transactions of the Royal Society of Tropical Medicine and Hygiene* 2018;112:136-143. PMID: 29697848 PMCID: PMC5961162.

Poster presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, Atlanta, GA (November 2016).

Snavely ME, Maze MJ, Muiruri C, Ngowi L, Mboya N, Beamesderfer J, Makupa GF, Mwingwa AG, Lwezaula BF, Mmbaga BT, Maro VP, Crump JA, Ostermann J, **Rubach MP**. Sociocultural and health system factors associated with mortality among febrile inpatients in Tanzania: a prospective social biopsy cohort study. *BMJ Global Health* 2018;3:e000507. PMID: 29527339 PMCID: PMC5841511.

Platform presentation of these results by Michael Snavelly at the American Society of Tropical Medicine and Hygiene Annual Meeting, Baltimore, MD (November 2017).

Cash-Goldwasser S, Maze MJ, **Rubach MP**, Biggs HM, Stoddard RA, Sharples KJ, Halliday JEB, Cleaveland S, Shand MC, Mmbaga BT, Muiruri C, Saganda W, Lwezaula BF, Kazwala RR, Maro VP, Crump JA. Risk Factors for Human Brucellosis in Northern Tanzania. *American Journal of Tropical Medicine and Hygiene* 2018;98:598-606. PMID: 29231152 PMCID: PMC5929176.

Poster presented at the American Society of Tropical Medicine and Hygiene Annual Meeting, Atlanta, GA (November 2016).

Moore CC, Hazard R, Saulters KJ, Ainsworth J, Adakun S, Amir A, Andrews BA, Auma M, Baker T, Banura P, Crump JA, Grobush MP, Huson MAM, Jacob ST, Olamide DJ, Kellett J, Lakhi S, Majwala A, Opio M, **Rubach MP**, Rylance J, Schieffelin J, Scheld WM, Ssekitoleko R, Wheeler I, Barnes LE. Derivation and validation of a universal vital assessment (UVA) score: a tool for predicting mortality in adult hospitalized patients in sub-Saharan Africa. *BMJ Global Health* 2017;2:e000344. PMID: 29082001 PMCID: PMC5656117.

Cleaveland S, Sharp J, Abela-Ridder B, Allan KJ, Buza J, Crump JA, Davis A, Del Rio Vilas VJ, de Glanville WA, Kazwala RR, Kibona T, Lankester FJ, Lugelo A, Mmbaga BT, **Rubach MP**, Swai ES, Waldman L, Haydon DT, Hampson K, Halliday JEB. One Health contributions towards more effective and equitable approaches to health in low- and middle-income countries. *Philosophical Transactions of the Royal Society B* 2017;372:20160168. PMID: 2854176 PMCID: PMC5468693.

Maze MJ, Biggs HM, **Rubach MP**, Galloway RL, Cash-Goldwasser S, Allan KJ, Halliday JE, Hertz JT, Saganda W, Lwezaula BF, Cleaveland S, Mmbaga BT, Maro VP, Crump JA. Comparison of the Estimated Incidence of Acute Leptospirosis in the Kilimanjaro Region of Tanzania between 2007-08 and 2012-14. *PLoS Neglected Tropical Diseases* 2016;10:e0005165. PMID: 27911902 PMCID: PMC5135036.

Zhang HL, Omondi MW, Musyoka AM, Afwamba IA, Swai RP, Karia FP, Muiruri C, Reddy EA, Crump JA, **Rubach MP**. The challenges of maintaining Good Clinical Laboratory Practices in low-resource settings: a health program evaluation framework case study from East Africa. *American Journal of Clinical Pathology* 2016;146:199-206. PMID: 27473737 PMCID: PMC6410885.

Weinberg JB, Volkheimer AD, **Rubach MP**, Florence SM, Mukemba JP, Kalingonji AR, Langelier C, Chen Y, Bush M, Yeo TW, Granger DL, Anstey NM, Mwaikambo ED. Monocyte polarization in children with falciparum malaria: relationship to nitric oxide insufficiency and disease severity. *Scientific Reports* 2016; 6:29151. PMID: 27385484 PMCID: PMC4935839.

Al-Emran HM, Krumkamp R, Dekker DM, Eibach D, Aaby P, Adu-Sarkodie Y, Ali M, **Rubach MP**, Bjerregaard-Andersen M, Crump JA, Cruz Espinoza LM, Løfberg SV, Gassama Sow A, Hertz JT, Im J, Jaeger A, Kabore LP, Konings F, Meyer CG, Niang A, Pak GD, Panzner U, Park SE, Rabezanahary H, Rakotozandrindrainy R, Raminosoa TM, Razafindrabe TJ, Sampo E, Schütt-Gerowitt H, Sarpong N, Soura AB, Tall A, von Kalckreuth V, Wierzba TF, May J, Marks F. Validation and Identification of Invasive Salmonella Serotypes in Sub-Saharan

African by Multiplex Polymerase Chain Reaction. *Clinical Infectious Disease* 2016;15:62 Suppl 1:S80-82. PMID: 26933026.

Rubach MP, Hanson KE. ID Learning Unit- Diagnostics Update: Current Laboratory Methods for Rapid Pathogen Identification in Patients with Bloodstream Infections. *Open Forum Infectious Diseases* 2015; 2:ovf174. PMID: 26719845 PMCID: PMC46909501.

Nichols C, Cruz Espinoza LM, von Kalckreuth V, Aaby P, Ahmed El Tayeb M, Ali M, Aseffa A, Bjerregaard-Andersen M, Breiman RF, Cosmas L, Crump JA, Dekker DM, Gassama Sow A, Gasmelseed N, Hertz JT, Im J, Kabore LP, Keddy KH, Konings F, Valborg Lofberg S, Meyer CG, Montgomery JM, Niang A, Njaraharinkamampionona A, Olack B, Pak GD, Panzner U, Park JK, Park SE, Rabezanahary H, Rakotondrainiarivelo JP, Rakotozandrindrainy R, Raminosoa TM, **Rubach MP**, Teferi M, Seo HJ, Sooka A, Soura A, Tall A, Toy T, Yeshitela B, Clemens JD, Wierzba TF, Baker S, Marks F. Bloodstream Infections and Frequency of Pretreatment Associated With Age and Hospitalization Status in Sub-Saharan Africa. *Clinical Infectious Disease* 2015;61 Suppl 4:S372-379. PMID: 26449954 PMCID: PMC4596935.

Rubach MP, Mukemba J, Florence S, Lopansri BK, Hyland K, Volkheimer AD, Yeo TW, Anstey NM, Weinberg JB, Mwaikambo ED, Granger DL. Impaired systemic tetrahydrobiopterin bioavailability and increased oxidized biopterins in pediatric falciparum malaria: association with disease severity. *PLoS Pathogens* 2015;11:e1004655. PMID: 25764173 PMCID: PMC4357384.

Poster presented at American Society of Tropical Medicine and Hygiene Annual Meeting, Washington, DC (November 2013).

Platform presentation at Nitric Oxide Society Meeting, Cleveland, OH (June 2014).

Rubach MP, Maro VP, Bartlett JA, Crump JA. Etiologies of illness among patients meeting Integrated Management of Adolescent and Adult Illness District Clinician Manual criteria for severe infections in northern Tanzania: implications for empiric antimicrobial therapy. *American Journal of Tropical Medicine and Hygiene* 2015;92:454-462. PMID: 25385866 PMCID: PMC4347355.

Platform presentation of these results at American Society of Tropical Medicine and Hygiene Annual Meeting, New Orleans, LA (November 2014).

Weinberg JB, Yeo TW, Mukemba JP, Florence SM, Volkheimer AD, Wang H, Chen Y, **Rubach M**, Granger DL, Mwaikambo ED, Anstey NM. Dimethylarginines: endogenous inhibitors of nitric oxide synthesis in children with falciparum malaria. *Journal of Infectious Diseases* 2014;210:913-922. PMID: 24620026 PMCID: PMC4192051.

Vanderburg S, **Rubach MP**, Halliday JE, Cleaveland S, Reddy EA, Crump JA. Epidemiology of *Coxiella burnetii* Infection in Africa: A OneHealth Systematic Review. *PLoS Neglected Tropical Diseases* 2014;8(4):e2787. PMID: 24722554 PMCID: PMC3983093.

Moon AM, Biggs HM, **Rubach MP**, Crump JA, Maro VP, Saganda W, Reddy EA. Evaluation of in-hospital management for febrile illness in northern Tanzania before and after 2010 World Health Organization Guidelines for the treatment of malaria. *PLoS ONE* 2014;9(2):e89814. PMID: 24587056 PMCID: PMC3933647.

Rubach MP, Halliday JE, Cleaveland S, Crump JA. Brucellosis in low-income and middle-income countries. *Current Opinion in Infectious Diseases* 2013;26(5):404-412. PMID: 23963260 PMCID: PMC3888775.

Rubach MP, Pavlisko EN, Perfect JR. Pericarditis mediated by respiratory syncytial virus in a hematopoietic stem cell transplant patient. *Transplant Infectious Disease* 2013;15(4):e152-156. PMID: 23725410.

Rubach MP, Mukemba J, Florence S, John B, Crookston B, Lopansri BK, Yeo TW, Piera KA, Weinberg JB, Anstey NM, Granger DL, Mwaikambo ED. Plasma *Plasmodium falciparum* histidine-rich protein-2 concentrations are associated with malaria severity and mortality in Tanzanian children. *PLoS ONE* 2012;7:e35895. PMID: 22586457 PMCID: PMC3346811.
Poster presented at American Society of Tropical Medicine and Hygiene Annual Meeting, Philadelphia, PA (December 2011).

Rubach MP, Bender JM, Mottice S, Hanson K, Weng HYC, Korgenski K, Daly JA, Pavia AT. Increasing Incidence of Invasive *Haemophilus influenzae* Disease in Adults, Utah, USA. *Emerging Infectious Diseases* 2011; 17 (9): 1645-50. PMID: 21888789 PMCID: PMC3322072
Poster presented at Infectious Disease Society of America Annual Meeting, Philadelphia, PA (October 2009).

Research Support

Sepsis Characterization in Kilimanjaro

NIH/NIAID

R01AI155733 (PI)

Sep 2020-August 2025

Aims to characterize sepsis sub-types in the clinical and epidemiologic context of sub-Saharan Africa based on immunologic host response signatures and on clinical phenotypic clustering via Bayesian statistical methods.

Viral zoonoses and severe febrile illness in northern Tanzania

NIH/NIAID

K23AI116869 (PI)

July 2016-June 2021

Seeks to detect prevalence of viral zoonotic disease as causes of severe febrile illness in northern Tanzania using both conventional microbiologic techniques and innovative pathogen discovery approaches.

Investigating Febrile Deaths in Tanzania

NIH/NIAID

R01AI121378-01 (Co-I)

January 2016-Dec 2020

Seeks to understand the causes of febrile deaths in Tanzania, both in terms of microbiologic etiology and non-biologic factors such as health service access and health system performance.

Completed Research

Estimating the burden of severe *Salmonella* infections in Tanzania

Bill & Melinda Gates Foundation
OPP1158210 (Co-I)

February 2017-January 2019

Aims to quantify morbidity and burden due to typhoid fever in northern Tanzania by conducting surveillance for severe manifestations of typhoid fever, and by conducting longitudinal follow-up of cases across one year from initial onset of illness.

Center for AIDS Research Supplement

NIH/NIAID

P30AI064518 (Project PI)

July 2017-June 2018

This was an administrative supplement from the Duke University Center for AIDS Research to the Investigating Febrile Deaths in Tanzania (R01AI121378). This supplement provided additional diagnostic testing resources for emerging viral pathogens via multiplex polymerase chain reaction assays in whole blood and in respiratory specimens collected from acute febrile illness participants.

Westat HIV Clinical Trials Network

NIH/NICHHD

HHSN2752013000003C MOD-2 (Co-I))

December 2015-May 2018

HIV studies as part of the International Maternal Pediatric and Adolescent AIDS Clinical Trials (IMPAACT) Network, in which the KCMC-Duke University Health Collaboration in Moshi, Tanzania is a participating site through NICHHD/Westat.

Medical Education Partnership Initiative

HRSA/NIH/FIC

R24 TW10008 (Co-I)

January 2015-March 2016

Through the Medical Education Partnership Initiative's Mentored Research Training Program at Kilimanjaro Christian Medical University, we developed a pilot project to prospectively collect data on non-biological risk factors (e.g., delays in care-seeking, health systems delays) that may contribute to poor outcomes among patients presenting with febrile illness.

Fogarty Global Health Fellowship

NIH/FIC

R25 TW009343 (PI)

July 2012-June 2013

The goal of this project was to assess impacts of bacterial zoonotic infections among livestock in northern Tanzania upon dietary nutrition and growth of children in livestock-owning households.

Awards

Outstanding Leadership in Scientific Training

September 2018

- Awarded by the Duke University School of Medicine and by the Duke University Center for AIDS Research in recognition of scientific mentorship of Duke University post-doctoral fellows who have conducted clinical research on-site at Kilimanjaro Christian Medical Centre in Moshi, Tanzania.

Pathology Fellow Award for Best Research Project

June 2015

- Awarded by the University of Utah Department of Pathology for a project in which I adapted and then assessed the performance of the Centers for Disease Control and Prevention

Rickettsial Branch Q Fever real-time polymerase chain reaction assay among acute febrile illness patients from Moshi, Tanzania.

William D. Odell Housestaff Award

June 2011

- Awarded by fellow housestaff as well as faculty to acknowledge the outstanding resident among the graduating cohort from the University of Utah Internal Medicine residency program.

Neonatology Resident of the Year

June 2011

- Awarded by neonatology faculty to one of the graduating residents from the University of Utah Pediatrics residency program.

American College of Physicians Clinical Vignette Poster

April 2011

- First place in the national associates clinical vignette poster contest at the ACP 2011 meeting in San Diego, CA. We presented a case of hemophagocytic lymphohistiocytosis secondary to disseminated histoplasmosis.

American Academy of Pediatrics Residency Research Grant

June 2009

- Awarded a \$3000 (maximum stipend) grant for my proposal to characterize more fully the metabolic acidosis in children with severe malaria. Funds were ultimately used to carry out a study demonstrating plasma level of *P. falciparum* histidine-rich protein-2 correlate with disease severity and are a more reliable marker of parasite burden than peripheral blood parasite count.

The Leonard Tow 2007 Humanism in Medicine Award

May 2007

- Awarded to one member of every graduating medical school class in the nation in recognition of exemplary compassion, competence and respect in the delivery of care. Accompanied by a \$1000 gift from the Arnold P. Gold Foundation.

Relevant Experience

Co-Director

Moshi, Tanzania

KCMC-Duke University Health Collaboration

November 2015–Present

- Oversight and management of a clinical research unit comprised of over 60 full-time employees
- Includes in-depth experience managing operational budgets, research ethics & regulatory compliance, sub-contractual agreements for research studies funded by the US National Institutes of Health, the Bill & Melinda Gates Foundation, and biomedical diagnostic companies
- Clinical research project management, including oversight of clinical research teams, data management teams, laboratory teams, and administrative teams
- Clinical research experience includes the following:
 - hospital-based fever etiology observational studies
 - community-based research involving livestock sampling to study epidemiology of zoonotic pathogens
 - population-based community-based surveys using World Health Organization EPI methodology
 - community control enrollment
 - US National Institutes of Health sponsored HIV clinical trials

- Evaluation of *in vitro* diagnostic devices
- Mentorship responsibilities for medical students, medical residents, and post-doctoral research fellows from Duke University and other institutions (typically 2-4 mentees per academic year)

Medical Director

Moshi, Tanzania

**KCMC-Duke University Health Collaboration Clinical
Research Laboratory**

November 2015–Present

- Clinical oversight of the clinical laboratory that supports the research conducted at our site in Kilimanjaro, Tanzania
- The laboratory operates to Good Clinical Laboratory Practice (GCLP) standards and is externally audited by the US National Institutes of Health on an annual basis
- Though my expertise and Clinical Pathology medical board certification is in Medical Microbiology, I am Medical Director over all sections of the laboratory: Hematology, Clinical Chemistry, Immunology, and Microbiology
- Microbiology facilities and capacity include automated blood culture detection systems; conventional biosafety level-2 bacteriology, including antibacterial susceptibility testing; conventional biosafety level-2 mycology; biosafety level-3 mycobacteriology, both conventional and molecular assays; molecular platforms for HIV viral load monitoring
- In-depth experience in procurement of laboratory reagents and supplies, and in securing biomedical engineering support in sub-Saharan Africa
- Laboratory medicine competencies: assay validation, molecular diagnostic assays, maintenance of Good Clinical Laboratory Practice standards. I am conversant in next-generation sequencing sample processing and laboratory procedures.

Consultant Doctor

Moshi, Tanzania

**Department of Internal Medicine
Kilimanjaro Christian Medical Centre**

November 2015–Present

- HIV ambulatory care: As an Internal Medicine specialist consultant, I provide clinical care each Wednesday in the hospital's HIV clinic. This includes precepting and teaching the Tanzanian Internal Medicine residents, the hospital interns and medical students
- Inpatient care: I also contribute clinically by overseeing Internal Medicine ward teams several times throughout the year (one week increments)
- In-depth experience in the management of HIV in sub-Saharan Africa and in the management of medically complex inpatients in resource-constrained settings

Other Experience

Hyperphenylalaninemia in Cerebral Malaria

Dar es Salaam, Tanzania

Resident Researcher

June-July 2009

- During my Internal Medicine-Pediatrics Residency, I worked for two months Prof. Donald Granger's NIH-funded malaria pathogenesis study in Tanzania. I assisted with screening and enrollment, and in general helped to optimize the execution of the study protocol. This was a foundational experience in global health research and clinical investigation.

Salesians of St. John Bosco

Salesian Lay Missioner Volunteer

Guayaquil, Ecuador

August 2002 – June 2003

- I lived and worked at one of the three shelters for street children in Guayaquil, Ecuador run by the Salesian fathers. Working long hours (12-14 hours/day), my responsibilities included remedial education, religious formation, coaching and accompaniment. The essence of my role was to be present as an older brother to the 12-20 children living in our street children center at any given time.

Woodrow Wilson School Research Program

Senior Summer Research Fellow

Princeton, NJ

June–July 2001

- Funding for five weeks of research on national tuberculosis control programs in Peru and Bolivia. My work consisted mainly of interviews and site visits with the Pan-American Health Organization, national health departments and non-governmental organizations in Lima, Peru, La Paz, Bolivia and Santa Cruz, Bolivia.

Hogar de Cristo Unidad Movil Medica

Volunteer

Santiago, Chile

March – July 2001

- Volunteered 1-2 times per week during my study abroad semester with the mobile medical unit in Santiago that rotated through the dozens of shanty towns in Santiago.

Amigos de Las Americas

Volunteer Community Health Promoter

Tarija, Bolivia

June – August 1999

- Worked in partnership with PLAN International's home improvement community projects aimed at controlling Chagas disease in southern Bolivia.

Amigos de las Americas

Volunteer Community Health Promoter

Cotopaxi, Ecuador

June – August 1997

- Worked in partnership with the agricultural ministry's rural development projects in sustainable farming practices and crop diversification.

Skills & Personal

Quantitative analysis: proficient in STATA and Prism GraphPad. Conversant in Open Data Kit coding for tablet-based questionnaire development.

Languages: Fluent in Spanish; advanced conversational in Kiswahili

Activities: road cycling, distance running

Favorite Literary Works: *The Book of Laughter and Forgetting* (Kundera), *Narcissus and Goldmund* (Hesse), *The Life and Times of Michael K* (Coetzee), *Don Quixote* (Cervantes), *Swann's Way* (Proust), *House Made of Dawn* (Momaday).

Favorite Musical Artists & Composers: Sam Cooke, Otis Redding, Silvio Rodriguez, Dvorak, Beethoven, Brahms, Saint-Saens, Sibelius, Rimsky-Korsakov.

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