

## **CURRICULUM VITAE**

**Michael Edward Emch**

### **EDUCATION**

- Ph.D. Geography, Michigan State University, East Lansing, MI (1998).
- M.A. Geography, Miami University, Oxford, OH (1992).
- B.A. Biology, Alfred University, Alfred, NY (1987).

### **PROFESSIONAL EXPERIENCE**

#### Present Employment

- W.R. Kenan, Jr. Distinguished Professor, Departments of Geography and Epidemiology, University of North Carolina at Chapel Hill.
- Fellow, Carolina Population Center, University of North Carolina at Chapel Hill.

#### Past Employment

- Chair, Department of Geography, University of North Carolina at Chapel Hill (2013-2018).
- Professor, Department of Geography and Department of Epidemiology, University of North Carolina at Chapel Hill (2010-2017).
- Associate Professor, Department of Geography, Adjunct in Department of Epidemiology University of North Carolina at Chapel Hill (2006-2010).
- Robert Wood Johnson Foundation Health & Society Scholar, Mailman School of Public Health & Institute for Social and Economic Research and Policy, Columbia University (2004-2006).
- Assistant to Associate Professor, Department of Geography and School of Community Health, Portland State University (2002-2006).
- Assistant Professor, Department of Geography, University of Northern Iowa (1998-2001).

### **SELECTED HONORS**

- Appointed permanent endowed professorship (W.R. Kenan, Jr. Distinguished Professor), 2017.
- UNC Academic Leadership Program Participant, 2014-15.
- Invited Speaker, United States Senate. World Malaria Day Event Hosted by the Senate Working Group on Malaria, U.S. Senate, Washington, D.C., 2012.
- Fulbright Senior Scholar Award. New Zealand, 2011.
- Committee Member. Committee on Spatial Data Enabling USGS Strategic Science in the 21<sup>st</sup> Century, National Research Council of the National Academies, 2009-2010.
- Invited United States NIH Delegation Member. United States-Japan Cooperative Medical Science Program's 8th International Conference on Emerging Infections in the Pacific Rim, National Institute of Allergy and Infectious Diseases of the U.S. National Institutes of Health, Dhaka, Bangladesh, 2003.
- Fulbright Scholar. Bangladesh, 1993.

### **WEB AND SOCIAL MEDIA**

- Spatial Health Research Group website: [spatialhealth.web.unc.edu/](http://spatialhealth.web.unc.edu/)
- Infectious Diseases, Epidemiology, and Ecology Lab website: [www.med.unc.edu/infdis/ideel](http://www.med.unc.edu/infdis/ideel)
- Faculty website in Geography Department: [emch.web.unc.edu/](http://emch.web.unc.edu/)

- UNC School of Public Health profile: [sph.unc.edu/adv\\_profile/michael-emch-phd/](http://sph.unc.edu/adv_profile/michael-emch-phd/)

## BOOKS AND CHAPTERS

### Books

1. Emch, M., Root, E., and Carrel, M. (2017) *Health and Medical Geography*. The Guilford Press: New York. ISBN 978-1-4625-2006-0. 512 pages.
2. Denaro, R; Brimhall, G; Chen, R; Donnellan, A; Emch, M; Jackson, I; Kelmelis, J; Lopez, X; Ojima, D; and Scanlon (2012) *Advancing Strategic Science: A Spatial Data Infrastructure Roadmap for the U.S. Geological Survey*. National Research Council: Washington, D.C., 115 pages.
3. Meade, M. and Emch, M. (2010) *Medical Geography*. 3<sup>rd</sup> Edition. The Guilford Press: New York. 498 pages.

### Book Chapters

4. Keeler C and Emch M (2018) *Infectious Diseases*. Eds: Crooks VA, Andrews G, and Pearce J. *Routledge Handbook of Health Geography*. Routledge: London.
5. Janko, M and Emch, M. (2016) “The Geography of Malaria Control in the Democratic Republic of Congo.” Eds. Harrington, DW, McLafferty, S, and Elliott, SJ. *Population Health Intervention Research: Geographical Perspectives*. Routledge, Abington, England.
6. Emch, M. and Giebultowicz, S. (2015) *Epidemiological Map*, In (Ed.) Monmonier, M. *Volume Six: Cartography in the Twentieth Century*, University of Chicago Press.
7. Winston, J. and Emch, M (2013) *Medical Geography*, in (Ed.) Warf, B. *Oxford Bibliographies in Geography*, Oxford University Press. [www.oxfordbibliographies.com](http://www.oxfordbibliographies.com)
8. Root, ED and Emch ME. (2013) *The Ecology of Injuries in Matlab, Bangladesh*. In Eds. King, B and Crews, K. *Ecologies and Politics of Health*. New York; Routledge Press. pp 99-117.
9. Emch M. and Carrel M. (2011) *Neighborhoods and Environmental Determinants of Infectious Diseases*. In: Nriagu JO (ed.) *Encyclopedia of Environmental Health*, volume 4. Burlington: Elsevier. pp. 64–71.
10. Root, E.D. and Emch, M. (2011) *Regional Environmental Patterns of Diarrheal Disease in Bangladesh: A Spatial Analytical and Multilevel Approach*. In Eds. Maantay, J and McLafferty, S. *Geospatial Analysis of Environmental Health* Springer-Verlag. pp. 191-204.
11. Emch, M. and Root, E. (2010) *Emerging and Re-emerging Diseases*. In Eds. Moon, G., McLafferty, S., and Brown, T. *A Companion to Health and Medical Geography*. Blackwell: Oxford, United Kingdom. pp. 154-172.
12. Emch, M.E. and Escamilla, V. (2010) *Cholera*. In (Ed.) Warf, B. *Encyclopedia of Geography*, Thousand Oaks, CA: SAGE Publications.
13. Wan, X-F; Emch, M.E. and Zhao, Z-M. (2009) *Advances in Molecular Evolution of Influenza A Virus*. In Ed. Mitraasinovic, P.M. *Global View of the Fight Against Influenza*. Nova Science Publishers, Inc: New York, pp. 31-57.
14. Emch, M.E. and Ali, M. (2003) *Spatial Cluster Analysis for Etiological Research and Identification of Socio-Environmental Risk Factors*. In Eds. Khan, O. and Skinner, R. *Geographic Information Systems and Health Applications*, Idea Group Publishing: Hershey, Pennsylvania, pp. 172-187.
15. Emch, M.E.; Naheed, A.; and Ali, M. (2002) *Tropical Disease*, In (Eds.) Levinson, D; Christensen, K.; et al., *Encyclopedia of Modern Asia*, New York: Charles Scribner's Sons.

16. Emch, M.E. (2001) The Human Ecology of Deforestation in Bangladesh. In Ed. Vajpeyi, D. *Deforestation, Environment and Sustainable Development: A Comparative Analysis*, Praeger, Westport, Connecticut, pp. 71-90.

### PEER-REVIEWED JOURNAL PAPERS

#### Published and In Press

17. Aydemir O, Janko M, Hathaway NJ, Verity R, Mwandagalirwa K, Tshefu AK, Tessema, SK, Marsh P, Tran AD, Reimonn T, Ghani A, Ghansah A, Juliano JJ, Greenhouse B, Emch M, Meshnick SR, Bailey JA. (2018) Drug resistance and population structure of Plasmodium falciparum across the Democratic Republic of Congo using high-throughput molecular inversion probes. *Journal of Infectious Diseases*. jiy223, doi: 10.1093/infdis/jiy223
18. Janko MM, Irish SR, Reich BJ, Peterson M, Doctor SM, Mwandagalirwa MK, Likwela JL, Tshefu AK, Meshnick SR, Emch ME (2018) The links between agriculture, Anopheles mosquitoes, and malaria risk in children under 5 in the Democratic Republic of Congo: A population-based cross-sectional and spatial study. *Lancet Planetary Health*. 2(2): e74–e82.
19. Levitz L, Janko M, Mwandagalirwa K, Thwai KL, Likwela JL, Tshefu AK, Emch M, Meshnick SR (2018) Effect of individual- and community-level bed net usage on malaria prevalence among under-fives in the Democratic Republic of Congo. *Malaria Journal*. 17:39.
20. Nazia N, Ali M, Zakariya M, Nahar Q, Yunus M, Emch M (2018) Spatial and population drivers of persistent cholera transmission in rural Bangladesh: Implications for vaccine and intervention targeting. *Spatial and Spatio-temporal Epidemiology*. 24: 1-9.
21. Stebbins R, Emch M, Meshnick SR (2018) The Effectiveness of Community Bed Net Use on Malaria Parasitemia Among Children Under 5 in Liberia. *American Journal of Tropical Medicine and Hygiene*. doi:10.4269/ajtmh.17-0619.
22. Parr JB, Lodge E, Holzmayer V, Pepin J, Frost EH, Fried MW, McGivern DR, Lemon SM, Keeler C, Emch E, Mwandagalirwa K, Tshefu A, Fwamba F, Muwonga J, Meshnick SR, Cloherty G (2018) An Efficient, Large-Scale Survey of Hepatitis C Viremia in the Democratic Republic of the Congo Using Dried Blood Spots. *Clinical Infectious Diseases*. 66(2): 254-260.
23. Mwandagalirwa MK, Levitz L, Thwai KL, Parr JB, Goel V, Janko M, Tshefu A, Emch M, Meshnick SR, Carrel, M (2017) Individual and household characteristics of persons with Plasmodium falciparum malaria in sites with varying endemicities in Kinshasa Province, Democratic Republic of the Congo. *Malaria Journal*. 16: 456.
24. Call M, Gray C, Yunus M, Emch M (2017) Disruption, not displacement: Climate variability and temporary migration in Bangladesh. *Journal: Global Environmental Change*. 46: 157-165.
25. Han L, Hudgens M, Emch M, Keeler C, Juliano J, Martinson F, Kathmunzi P, Tegha G, Hoffman I (2017) RTS,S/AS01 malaria vaccine efficacy and its interaction with seasonal precipitation: Results from a phase 3 randomized controlled trial in Lilongwe, Malawi. *Scientific Reports*. 7: 7200.
26. Holliday K, Howard AG, Emch M, Rodríguez DA, Rosamond WD, Evenson KR (2017) Are Buffers around Home Representative of Physical Activity Spaces among Adults? *Health and Place*. 45, 181-188.

27. Escamilla V, Alker A, Dandolo L, Juliano JJ, Miller WC, Kamthuzza P, Tembo T, Tegha G, Martinson F, Emch M, Hoffman IF (2017) Effects of community level bed net coverage on malaria morbidity in Lilongwe, Malawi. *Malaria Journal*. 16 (1), 142.
28. Holliday K, Howard AG, Emch M, Rodríguez DA, Rosamond WD, Evenson KR (2017) Where Are Adults Active? An Examination of Physical Activity Locations Using GPS in Five United States Cities. *Journal of Urban Health*, 1-11
29. Wong WCW, Zhao Y, Miu HYH, Tucker JD, Parish WL, Yang L-G, Emch M, Ho KM, Yeung F (2017). Prevalence and risk factors of chlamydia infection in Hong Kong: A population-based geospatial household survey and testing. *PLoS One*, 12 (2), e0172561.
30. Becker-Dreps S, Cuthbertson CC, Bucardo F, Vinje J, Paniagua M, Giebultowicz S, Espinoza F, Emch M (2017) Environmental factors associated with childhood norovirus diarrhoea in León, Nicaragua. *Epidemiology and Infection*. 145 (8), 1597-1605.
31. Holliday KM, Howard AG, Emch M, Rodríguez DA, Rosamond WD, Evenson KR (2017) Deriving a GPS Monitoring Time Recommendation for Physical Activity Studies of Adults. *Medicine and Science in Sports and Exercise* 49 (5), 939-947
32. Parr JB, Verity R, Doctor SM, Janko M, Carey-Ewend K, Turman BJ, Keeler C, Hannah C. Slater, Whitesell AN, Mwandagalirwa K, Ghani AC, Likwela JL, Tshetu AK, Emch M, Juliano JJ, Meshnick SR (2017) Pfhrp2-deleted Plasmodium falciparum 1 parasites in the Democratic Republic of Congo: A national cross-sectional survey. *Journal of Infectious Diseases*. 216 (1): 36-44.
33. Miller WM, Miller WC, Barrington C, Weir SS, Chen SY, Emch ME, Pettifor AE, Paz-Bailey G (2016) The Where and How for Reaching Transgender Women and Men Who Have Sex with Men with HIV Prevention Services in Guatemala. *AIDS and Behavior*. 21 (12), 3279-3286.
34. Doung-Ngern P, Padungtod P, Emch M, Weber D, Kersh G, Koch G, Meshnick S. (2016) Prevalence and risk factors of seropositivity to *C. burnetii* infection in dairy farms and dairy farmers, Chiang-Mai, Thailand 2015. *International Journal of Infectious Diseases* 53 (supplement), 21-22.
35. Doctor SM, Liu Y, Anderson OG, Whitesell AN, Mwandagalirwa MK, Muwonga J, Keeler C, Emch M, Likwela JL, Tshetu A, Meshnick SR. (2016) Low prevalence of Plasmodium malariae and Plasmodium ovale mono-infections among children in the Democratic Republic of the Congo: a population-based, cross-sectional study. *Malaria Journal*. 15:350. PMID 27392905.
36. Ncayiyana JR, Bassett J, West N, Westreich D, Musenge E, Emch M, Pettifor A, Hanrahan CF, Schwartz SR, Sanne I, van Rie A (2016) Prevalence of latent tuberculosis infection and predictive factors in an urban informal settlement in Johannesburg, South Africa: a cross-sectional study. *BMC Infectious Diseases*. 16(1): 1.
37. Winston J, Emch M, Meyer R, Langlois P, Weyer P, Mosley B, Olshan A, Band L, Luben T (2016) Hypospadias and maternal exposure to atrazine via drinking water in the National Birth Defects Prevention study. *Environmental Health*. 15(1): 76.

38. Cope AB, Powers KA, Serre ML, Escamilla V, Emch M, Leone PA, Mobley VL, Miller WC (2016) Distance to testing sites and its association with timing of HIV diagnosis. *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*. 28(11): 1423-27.
39. Parr J, Belson C, Patel J, Hoffman I, Kamthunzi P, Martinson F, Tegha G, Thengolose I, Drakeley C, Meshnick S, Escamilla V, Emch M, Juliano J. (2016) Estimation of Plasmodium falciparum Transmission Intensity in Lilongwe, Malawi, by Microscopy, Rapid Diagnostic Testing, and Nucleic Acid Detection. *American Journal of Tropical Medicine and Hygiene*. 3;95(2):373-7.
40. Carrel M, Janko M, Mwandagalirwa MK, Morgan C, Fwamba F, Muwomba J, Tshetu AK, Meshnick S, Emch M (2016) Changing spatial patterns and increasing rurality of HIV prevalence in the Democratic Republic of the Congo between 2007 and 2013. *Health & Place*. 39: 79-85.
41. Wu J, Yunus M, Streatfield PK, Emch M. (2016) Influence of climate extremes and land use on fecal contamination of shallow tubewells in Bangladesh. *Environmental Science & Technology*. 50(5): 2669-2676.
42. Doctor S, Liu Y, Whitesell A, Thwai K, Taylor S, Janko M, Emch M, Kashamuka M, Muwonga J, Tshetu A, Meshnick S. (2016) Malaria Surveillance in the Democratic Republic of the Congo: Comparisons of Microscopy, PCR, and Rapid Diagnostic Test. *Diagnostic Microbiology and Infectious Disease*. 85(1):16-8. PMID 26915637.
43. Escamilla V, Hampton KH, Gesink DC, Serre ML, Emch M, Leone PA, Samoff E, Miller WC (2016) Influence of Detection Method and Study Area Scale on Syphilis Cluster Identification in North Carolina. *Sexually Transmitted Diseases*. 43(4): 216-221.
44. Smith GS, Van DenEeden SK, Garcia C, Shan J, Baxter R, Herring AH, Richardson DB, VanRie A, Emch M, Gammon MD. (2016) Air Pollution and the Risk of Pulmonary Tuberculosis: A Nested Case-Control Study among Members of a Northern California Health Plan. *Environmental Health Perspectives*. 124(6): 761-768.
45. Perez-Heydrich C, Warren, J, Burgert C, Emch M (2015) Influence of Demographic and Health Survey Point Displacements on Raster-Based Analyses. *Spatial Demography*. 1-19. DOI 10.1007/s40980-015-0013-1.
46. Han L, Wei C, Muessig KE, Bien CH, Meng G, Emch ME, Tucker JD. (2016) HIV test uptake among MSM in China: Implications for enhanced HIV test promotion campaigns among key populations. *Global Public Health*. 12(1): 31-44..
47. Van Treuren W, Ponnusamy Brinkerhoff LR, Gonzalez A, Parobek C, Juliano J, Andreadis T, Falco R, Ziegler LB, Hathaway N, Keeler C, Emch M, Bailey J, Roe RM, Apperson C, Knight R, Meshnick S (2015) Variations in the Microbiota of Ixodes ticks with geography, species and sex. *Applied and Environmental Microbiology*. 81(18): 6200-9.
48. Warren J, Perez-Heydrich C, Burgert C, Emch M (2015) Influence of Demographic and Health Survey Point Displacements on Distance-Based Analyses. *Spatial Demography*. 1-19. DOI 10.1007/s40980-015-0014-0.
49. Smith G, Van Den Eeden SK, Baxter R, Shan J, Van Rie A, Herring AH, Richardson D, Emch M, Gammon, MD. (2015) Cigarette smoking and pulmonary tuberculosis in northern California. *Journal of Epidemiology & Community Health*. 69(6): 568-73.

50. Rosenberg M, Pettifor A, Lippman SA, Thirumurthy H, Emch M, Miller WC, Selin A, Gómez-Olivé FX, Hughes JP, Laeyendecker O, Tollman S, Kahn K (2015) Relationship between community-level alcohol outlet accessibility and individual-level HSV-2 infection among young women in South Africa. *Sexually Transmitted Diseases*. 42(5): 259-265.
51. Warren J, Perez-Heydrich C, Burgert C, Emch M (2015) Influence of Demographic and Health Survey Point Displacements on Point-in-Polygon Analyses. 1-17. *Spatial Demography*. DOI 10.1007/s40980-015-0015-z.
52. Rosenberg M, Pettifor A, Van Rie A, Thirumurthy H, Emch M, Miller WC, Gómez-Olivé X, Twine R, Hughes J, Laeyendecker O, Selin A, Kahn K (2015) The relationship between alcohol outlets, HIV risk behavior, and HSV-2 infection among South African young women: A cross-sectional study. *PLoS One*. 10(5): e0125510 .
53. Carrel M, Patel JC, Taylor S, Janko M, Kashamuka M, Tshefu A, Escalante A, McCollum A, Alam MT, Udhayakumar V, Meshnick S, Emch M (2015) The geography of malaria genetics in the Democratic Republic of Congo: a complex and fragmented landscape. *Social Science & Medicine*. 133: 233-241.
54. Rosenberg M; Pettifor A; Miller WC; Thirumurthy H; Emch M; Sulaimon A; Kahn K; Collinson M; Tollman S (2015) Relationship between school dropout and teen pregnancy among rural South African young women. *International Journal of Epidemiology*. doi: 10.1093/ije/dyv007
55. Tan NX, Tan GX, Yan L, Yang B, Powers KA, Emch ME, Tucker JD (2014) Temporal Trends in Syphilis and Gonorrhea Infections in Guangdong Province, China. *Journal of Infectious Diseases*. 209 (3): 426-430.
56. Winston JJ; Meyer RE; Emch ME (2014) A geographic analysis of compositional and contextual risk factors for hypospadias births. *Birth Defects Research Part A: Clinical and Molecular Teratology*. 100(11): 887-894.
57. Cash BA; Rodó X; Emch M; Yunus M; Faruque ASG; Pascual M. (2014) Cholera and Shigellosis: Different Epidemiology but Similar Responses to Climate Variability. *PLoS One*. 9(9): e107223.
58. Han L; Bien C; Wei C; Muessig KE; Yang M; Liu F; Yang L; Meng R; Emch M; Tucker JD. (2014) HIV Self-Testing Among Online MSM in China: Implications for Expanding HIV Testing Among Key Populations. *Journal of AIDS*. 67(2): 216–221.
59. Escamilla, V; Emch, M; Dandalo, L; Miller, WC; Martinson, F; Hoffman, I. (2014) Community level sampling using Google Earth satellite imagery and geographical methods in the absence of a Demographic Surveillance System. *Bulletin of the World Health Organization*. 92:690-694.
60. Antonia AL; Taylor SM; Janko M; Emch M; Tshefu AK; Meshnick SR. (2014) A Cross-sectional Survey of Plasmodium falciparum pfcrt Mutant Haplotypes in the Democratic Republic of Congo. *American Journal of Tropical Medicine and Hygiene*. 90:1094-1097.
61. Patel JC; Taylor SM; Juliano JJ; Parobek CM; Janko M; Gonzalez LD; Tshefu AK; Emch M; Udhayakumar V; Lindblade K; Meshnick SR (2014) Genetic evidence for the importation of falciparum malaria by Guatemalan soldiers returning from the Democratic Republic of the Congo. *Emerging Infectious Diseases*. 20(6): 932-940.

62. Perez-Heydrich C; Hudgens MH; Halloran ME; Clemens J; Ali M; Emch, M. (2014). Assessing the effects of cholera vaccination in the presence of interference. *Biometrics*. 70(3): 731-41.
63. Wu, J; Yunus, M; Streatfield, PK; Emch, M. (2014) Association of climate variability and childhood diarrhoeal disease in rural Bangladesh, 2000-2006. *Epidemiology and Infection*. 142: 1859-1868.
64. Carrel, M; Eron, JJ; Emch, M; Hurt, CB (2014) Spatial epidemiology of recently acquired HIV infections across rural and urban areas of North Carolina. *PLoS One*. 9(2): e88512.
65. Wan, X-F; Carrel, M; Long, L; Alker, A; and Emch, M. (2013) Perspective on emergence and re-emergence of amantadine resistant influenza A viruses in domestic animals in China. *Infection, Genetics and Evolution*. 20C: 298-303.
66. Messina, JP; Mwandagilirwa, K; Taylor, SM; Emch, M; Meshnick, SR. (2013) Assessing the Spatial, Social, and Disease-related Determinants of Anemia in Congolese Women. *Health & Place*. 24: 54-64.
67. Bien, CH; Cai; Emch, M; Parish, W; Tucker, J. (2013) High Adult Sex Ratios and Risky Sexual Behaviors: A Systematic Review. *PLoS One*. 8(8): e71580.
68. Dahly, D; Gordon-Larsen, P; Emch, M; Borja, J; and Adair, L (2013) The Spatial Distribution of Overweight and Obesity Among a Birth Cohort of Young Adult Filipinos (Cebu Philippines, 2005): An Application of the Kulldorff Spatial Scan Statistic. *Nutrition & Diabetes* 3, e80.
69. Bowman NM; Congdon S; Mvalo T; Patel JC; Escamilla V; Emch M; Martinson F; Hoffman I; Meshnick SR; Juliano JJ (2013) Comparative population structure of Plasmodium falciparum circumsporozoite protein NANP repeat lengths in Lilongwe, Malawi. *Scientific Reports*. *Scientific Reports*. 3: 1990.
70. Carrel, M. and Emch, M. (2013) Genetics: A New Landscape for Medical Geography. *Annals of the Association of American Geographers*. 103(6): 1452-1467.
71. Winston, J; Escamilla, V; Perez-Heydrich, C; Carrel, M; Yunus, M; Streatfield, PK; Emch, M. (2013). Protective Benefits of Deep Tube Wells Against Childhood Diarrhea in Matlab, Bangladesh. *American Journal of Public Health*. 103(7): 1287-91.
72. Escamilla, V; Knappett, P; Yunus, M; Streatfield, PK; Emch, M (2013) Influence of Latrine Proximity and Type on Tubewell Water Quality and Diarrheal Disease in Bangladesh. *Annals of the Association of American Geographers*. 103(2): 299-308.
73. Ali, M.; Kim, D.R.; Yunus, M.; Emch, M. (2013) Time Series Analysis of Cholera in Matlab, Bangladesh during 1988-2001. *Journal of Health, Population, and Nutrition*. 31(1) 11-19.
74. Taylor, SM; Antonia AL; Parobek CM; Juliano JJ; Janko M; Emch M; Alam MT; Udhayakumar V; Tshetu A; Meshnick SR (2013) Plasmodium falciparum Sulfadoxine Resistance is Geographically and Genetically Partitioned within the DR Congo. *Scientific Reports*. 3: 1165.
75. Root, ED; Rodd, J; Yunus, M; Emch, M. (2013) Longitudinal Trends in Cholera: The Role of Socioeconomic Status in Matlab, Bangladesh, 1993-2007. *PLoS Neglected Tropical Diseases*. 7(1): e1997.

76. Perez-Heydrich, C; Braly, JM; Giebultowicz, S; Winston, J; Yunus, M; Streatfield, PK; and Emch, ME. (2013) Social and Spatial Processes Associated with Childhood Diarrheal Disease in Matlab, Bangladesh. *Health & Place*. 19: 45-52. PMC3537872
77. Knappett, PSK; McKay, LD; Layton, A; Alam, MJ; Mailloux, MJ; Ferguson, A; Culligan, PJ; Serre, ML; Emch, M; Ahmed, KM; van Geen, A. (2012). Unsealed Tubewells Lead to Increased Fecal Contamination of Drinking Water. *Journal of Water and Health*. 10(4): 565-578.
78. Ferguson, AS; Layton, AC; Mailloux, BJ; Culligan, PJ; Williams, DW; Smartt, AE; Sayler, GS; Feighery, J; McKay L; Knappett, PSK; Alexandrova, E; Arbit, T; Emch, M; Escamilla, V; Ahmed, KM; Alam, MJ; Streatfield, PK; Yunus, M; van Geen, A. (2012) Comparison of Fecal Indicators with Pathogenic Bacteria and Rotavirus in Groundwater. *Science of the Total Environment*. 431(1): 314-322.
79. Knappett, P; McKay, LD; Layton, A; Williams, DE; Alam, MJ; Huq, MR; Mey, J; Feighery, JE; Culligan, PJ; Mailloux, MJ; Zhuang, J; Escamilla, V; Emch, M; Perfect, E; Sayler, GS; Ahmed, KM; van Geen, A. (2012) Implications of Fecal Bacteria Input From Latrine-Polluted Ponds For Wells in Sandy Aquifers. *Environmental Science & Technology*. 46 (3): 1361-1370.
80. Wu, X; D Tucker, JD; Hong, F; Messina, J; Lan, L; Hu, Y; Feng, T; Emch, ME; Liu, X; Zhang, C; Wen, L (2012) Multilevel and Spatial Analysis of Syphilis in Shenzhen China to Inform Spatially Targeted Control Measures. *Sexually Transmitted Infections*. 88(5): 325-329.
81. Carrel, M; Wan, X-F; Nguyen, T; Emch, M (2012) H5N1 Avian Influenza Viruses Exhibit Few Barriers to Gene Flow in Vietnam. *EcoHealth*. 91(1): 60-69.
82. Reiner, R.; King, A; Emch, M.; Yunus, M.; Faruque, A.; Pascual, M. (2012) Highly Localized Sensitivity to Climate Forcing Drives Endemic Cholera in a Megacity. *Proceedings of the National Academy of Sciences*. 109(6): 2033-2036.
83. Carrel, M.; Emch, M; Nguyen, T; Jobe, RT; Wan, X-F. (2012) Population-environment Drivers of H5N1 Avian Influenza Molecular Change in Vietnam. *Health & Place*. 18(5): 1122-1131.
84. Emch, ME; Root, ED; Giebultowicz, S; Ali, M; Perez-Heydrich, C; Yunus, M. (2012) Integration of Spatial and Social Network Analysis in Disease Transmission Studies. *Annals of the Association of American Geographers*. 102(5): 1004-1015.
85. Carrel, M.; Wan, X-F; Nguyen, T.; Emch, M. (2011) Genetic Variation of Highly Pathogenic H5N1 Avian Influenza Viruses in Vietnam Shows Both Species-Specific and Spatiotemporal Associations. *Avian Diseases*. 6(4): e25-e27.
86. Giebultowicz, S; Ali, M; Yunus, M; Emch, M. (2011) A Comparison of Spatial and Social Clustering of Cholera in Matlab, Bangladesh. *Health & Place*. 17: 490-497.
87. Wu, J.; Yunus, M.; Streatfield, P.K., van Geen, A.; Escamilla, V.; Akita, J.; Serre, M.; Emch, M. (2011) Impact of Tubewell Access and Depth on Childhood Diarrhea in Matlab, Bangladesh. *Environmental Health*. 10:109
88. Wu, J.; van Geen, A.; Matin, KMM; Akita, Y; Alam MJ; Culligan, PJ; Escamilla, V; Feighery, J; Ferguson, AS; Knappett, P; Mailloux, BJ; McKay, L; Serre, M; Streatfield, PK; Yunus, M; Emch, M. (2011) Increase in Diarrheal Disease Associated with Arsenic Mitigation in Bangladesh. *PLoS One*. 6(12): e29593.
89. Giebultowicz, S; Ali, M; Yunus, M; Emch, M. (2011) The Simultaneous Effects of Spatial and Social Networks on Cholera Transmission. *Interdisciplinary Perspectives on Infectious Diseases*. 2011: 604372.



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#### In Review

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150. Barkley B, Hudgens M, Clemens J, Ali M, Emch M (submitted) Causal Inference from Observational Studies with Clustered Interference.
151. Loh WW, Hudgens MG, Clemens JD, Ali M, Emch ME (submitted) Randomization inference with general interference and censoring.
152. Liu L, Hudgens MG, Saul B, Clemens JD, Ali M, Emch ME (submitted) Doubly Robust Estimation in Observational Studies with Partial Interference.

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154. Bailey SC, O’Conor R, Martin LT, Fang G, Annis IE, Paasche-Orlow MK, Alan Brookhart A, Emch M, Wolf MS (submitted) Predictive Modeling and Performance-based Assessments of Health Literacy: Relationships with Clinical Measures.
155. Janko M, Churcher TS, Emch ME, Meshnick SR (submitted) Strengthening long-lasting insecticidal nets effectiveness monitoring using retrospective analysis of cross-sectional, population-based surveys across sub-Saharan Africa.
156. Wu J, Yunus M, Ali M, Escamilla V, Emch M (submitted) Influences of heatwave, rainfall, and tree cover on cholera in Bangladesh.

#### Proceedings

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#### Technical Reports

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2. Perez-Heydrich C, Warren, JL; Burgert CR, Emch ME (2013) Guidelines on the Use of DHS GPS Data. Spatial Analysis Reports No. 8. Calverton, Maryland, USA: ICF International.

### **CONFERENCE PRESENTATIONS AND INVITED COLLOQUIA**

#### Conference Presentation Abstracts

1. Emch, M. “Measuring malaria vaccine effectiveness: Incorporating environmental and genetic contexts into trials” *Association of American Geographers*, New Orleans, 4/12/18.
2. Emch, M. “Spatial Epidemiology in Infectious Disease Research” *International Symposium on STD Clinical Services for High-risk Populations*, Shenzhen Nanshan Center for Chronic Disease Control, Shenzhen, China, 9/26/17.
3. Emch, M. “Finding Safe Drinking Water to Mitigate Arsenic Contamination in Bangladesh: Are Deep Tube Wells the Answer?” *International Medical Geography Symposium*, Angers, France 7/4/17.
4. Emch, M. “Landscape Genetics of Malaria in the Democratic Republic of Congo: Drug and Diagnostic Resistance” *Association of American Geographers*, Boston, 4/6/17.
5. Emch, M. “Using Satellite Imagery to Construct Household Sampling Frames (including an occasional latrine)” Demography Daze, Duke University Population Research Institute, 5/12/16.

6. Emch, M. "The disease ecology of malaria vaccine effectiveness: Incorporating environmental and genetic contexts into trials" *Association of American Geographers*, San Francisco, 4/1/16.
7. Emch M. "What's New in Studies of Place and Health?" *Connecting Population Health Sciences: Building Bridges to Improve Population Health*. The National Academy of Sciences, Washington, DC. 9/29/15.
8. Emch, M. "Incorporating geographic context into cholera and malaria vaccine trials." *International Medical Geography Symposium*, Vancouver, CA, 7/6/15.
9. Emch, M "Incorporating geographic context into randomized controlled trials", *Association of American Geographers*, Chicago, 4/22/15.
10. Emch, M.; Carrel M.; Patel, J; Janko, M.; Taylor, S; Meshnick, M. "Spatial Patterns of Drug-Resistance Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach." *Association of American Geographers*, Tampa, 4/12/14.
11. Emch, M. and Carrel M. "Spatial Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach." *International Medical Geography Symposium*, East Lansing, MI, 7/9/13.
12. Emch, M; Carrel, M; and Meshnick, S. Spatio-temporal Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach, *Association of American Geographers*, Los Angeles, 4/12/13.
13. Emch, M. Climate Variability and Vulnerability to Water-related Disease: The case of cholera. *Water and Climate Change in Africa*, Duke University, Durham, NC, 3/23/13.
14. Emch, M. "Cholera ecological epidemiology." *Earth Observation and Environmental Modeling for Mitigation of Health Risks*, Berg-en-Dal, Kruger National Park, South Africa 2/14/13.
15. Emch, M; Perez-Heydrich, C; Verdery, A; Ali, M; Clemens, J; Yunus, M. "Integrating the Effects of Space, Environment, and Social Networks in a Phase III Oral Cholera Vaccine Trial." *47th US-Japan Conference on Cholera and Other Bacterial Enteric Infections*, Chiba, Japan, 12/12/12.
16. Emch, M. "Spatial Analysis in Infectious Disease Research." *1<sup>st</sup> Annual UNC-China Sexually Transmitted Diseases Training Conference*, Guangzhou, China, 5/28/12.
17. Emch, M. "Spatial Analysis in HIV Research in the Democratic Republic of Congo and North Carolina." *6<sup>th</sup> Annual China Sexually Transmitted Disease Conference*, Shenzhen, China, 5/25/12.
18. Braly, J; Giebultowicz, S; Perez-Heydrich, C; Ali, M; Yunus, M; Emch, M. "Integration of Spatial and Social Network Analysis in Understanding Diarrheal Disease Transmission: a Case Study in Rural Bangladesh." *Association of American Geographers*, New York, 2/26/12.
19. Emch, M; Escamilla, V; Wagner, B; Yunus, M; Streatfield, PK; van Geen, A. "Impact of Deep Tubewells on Childhood Diarrhea in Bangladesh" *Association of American Geographers*, New York, 2/25/12.
20. Giebultowicz, S. and Emch, M. "The Spatial Epidemiology of Chronic Kidney Disease in Nicaragua" *Association of American Geographers*, New York, 2/24/12.
21. Winston, J; Emch, M; Meyer, R. "An Exploration of Clustering of Hypospadias Births in North Carolina" *Association of American Geographers*, New York, 2/24/12.
22. Messina, J; Mwandagilirwa, K; Emch, M; Meshnick, S. "The Geography and Ecology of Anemia in the Democratic Republic of Congo." *American Society of Tropical Medicine and Hygiene*, Philadelphia, 12/06/11.
23. Messina, J; Taylor, S; Meshnick, SR; Emch, M. "Population, Behavioral and Environmental Drivers of Malaria Prevalence in the Democratic Republic of Congo" *Association of American Geographers*, Seattle, 4/15/11.

24. Carrel, M; Escamilla, V; Messina, J; Giebultowicz, S; Winston, J; Yunus, M; Streatfield, PK; Emch, M. "Greater Tubewell Density Decreases Diarrheal Disease Risk in Rural Bangladesh: A Zero-inflated and Geographically Weighted Analysis." *Association of American Geographers*, Seattle, 4/12/11.
25. Root, ED and Emch, M. "Regional Environmental Patterns of Diarrheal Disease in Bangladesh" *Association of American Geographers*, Seattle, 4/12/11.
26. Giebultowicz, S; Emch, M; Root, E; Ali, M; Yunus, M. "The Integration of Spatial and Social Network Analysis in Disease Transmission Studies" *Association of American Geographers*, Seattle, 4/12/11.
27. Carrel, M; Wan, X-F; Emch, M. "H5N1 Avian Influenza Genetic Variation in Vietnam Shows Greater Spatio-temporal Association than Species-specific Association" *Association of American Geographers*, Seattle, 4/12/11.
28. Messina, J; Taylor, S; Emch, M; Meshnick, S. "Measuring Malaria in the Democratic Republic of the Congo by Molecular Analyses of Leftover Dried Blood Spots from the 2007 Demographic Health Survey" *Global Health Metrics & Evaluation: Controversies, Innovation, Accountability*, Seattle. 3/14/11.
29. Feighery, J; Culligan, P; Ferguson, AS; Mailloux, BJ; McKay, LD; Ahmed, K; Alam, M; Huq, M; Emch, M; Serre, ML; Yunus, M; van Geen, A. Comparing laboratory column test treatments with field profiles of fecal indicator bacteria and virus from concentrated source areas. *American Geophysical Union Annual Meetings*. San Francisco. 12/13/10.
30. van Geen, A; Ahmed, K; Akita, Y; Alam, M; Culligan, P; Feighery, J; Ferguson, AS; Emch, M; Escamilla, V; Knappett, P; Layton, A; Mailloux, BJ; McKay, LD; Mey, JL; Serre, ML; Streatfield, PK; Wu, J; Yunus, M Could Arsenic Mitigation Lead to Increased Diarrheal Disease in Bangladesh? *American Geophysical Union Annual Meetings*. San Francisco. 12/13/10.
31. Knappett, PS; Escamilla, V; Layton, A; McKay, LD; Emch, M; Mailloux, BJ; Williams, DE; Huq, MR; Alam, M; Farhana, L; Ferguson, AS; Saylor, GS; Ahmed, K; Serre, ML; Akita, Y; Yunus, M; van Geen, A Factors Influencing Fecal Contamination in Pond of Bangladesh. *American Geophysical Union Annual Meetings*. San Francisco. 12/13/10.
32. Taylor, SM; Messina, J; Hand, CC; Mwandagalirwa, K; Tshefu, AK; Matindii, A; Muwonga, M; Emch, M; Meshnick, SR. Quantifying the burden of pregnancy-associated malaria in the Democratic Republic of the Congo. *American Society of Tropical Medicine and Hygiene*, Atlanta, 11/05/10.
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34. Emch, M.; Giebultowicz, S.; Root, E.D.; Ali, M. "Integration of Spatial and Social Network Analysis in Disease Transmission Studies." *Association of American Geographers*, Washington, D.C., 4/16/10.
35. Emch, M. Fecal Contamination in Tubewell Water of Matlab, Bangladesh: Sources and Health Impact on Diarrheal Disease. *Water and Health: Where Science Meets Policy*. Chapel Hill, 10/15/10.
36. Ali, M.; Emch, M.; Park, J.K.; Yunus, M.; Clemens, J. "Natural Cholera Infection Derived Immunity in an Endemic Setting." *44th US-Japan Conference on Cholera and Other Bacterial Enteric Infections*, San Diego, CA, 10/13/09.

37. Messina, J.; Emch, M.; and Feldacker, C. "Seasonality of global cholera patterns, 1930 to 2005." *International Medical Geography Symposium*, Hamilton, Ontario, 7/17/09.
38. Carrel, M.; Emch, M.; Jobe, T.; Moody, A.; Wan, X-F. "The Geography of avian influenza in Vietnam: a spatiotemporal analysis of viral evolution." *International Medical Geography Symposium*, Hamilton, Ontario, 7/16/09.
39. Emch, M. and Escamilla, V. "A population-environment approach to understanding groundwater risk of bacterial and viral pathogens in Bangladesh" *International Medical Geography Symposium*, Hamilton, Ontario, 7/16/09.
40. Root, E.D. and Emch, M. "Evidence for neighborhood effects on health: the case of birth defects in North Carolina." *International Medical Geography Symposium*, Hamilton, Ontario, 7/14/09.
41. Emch, M.E. Invited Conference Kickoff Lecture, "Spatial Introduction: Incorporating Spatial, Environmental, and Social Network Analysis in Disease Research," *Capturing Context: Bridging Spatial and Network Analyses*, Columbia University, New York, 6/12/09.
42. Kalkbrenner, AE; Daniels, JL; Poole, CL; Chen, JC, and Emch, M. "Accessibility of Health Services and Age at Autism Diagnosis." *International Meeting for Autism Research*. Chicago, IL. 5/8/09.
43. Giebultowicz, S.; Root, E. and Emch, M. "Examining the Role of Social Networks and Herd Immunity in a Cholera Vaccine Trial in Bangladesh." *Population Association of America*, Detroit, MI. 4/30/09.
44. Emch, M. and Mailloux, B. "Does Arsenic Mitigation in Bangladesh Raise Exposure to Microbial and Viral Pathogens?" *Ecology of Infectious Diseases Annual Meetings*, National Institutes of Health, Park City, UT. 4/1/09.
45. Escamilla, V.; Emch, M.; van Geen, A.; Akita, Y.; Serre, M.; Band, L. "Effects of Neighborhood Water and Sanitation on Diarrheal Disease Incidence in Rural Bangladesh." *Association of American Geographers*, Las Vegas, NV, 3/27/09.
46. Giebultowicz, S.; Emch, M.; Ali, M. "Effects of social networks and space on cholera transmission in Bangladesh." *Association of American Geographers*, Las Vegas, NV, 3/27/09.
47. Messina, J.; Emch, M.; Feldacker, C. "Seasonality of Global Cholera Patterns, 1930 to 2005." *Association of American Geographers*, Las Vegas, NV, 3/26/09.
48. Emch, M.; Ali, M.; Escamilla, V.; Feldacker, C. "Local population and regional environmental drivers of cholera in Bangladesh." *Association of American Geographers*, Las Vegas, NV, 3/26/09.
49. Carrel, M.; Wan, X-F.; Jobe, RT.; Moody, A.; Emch, M. "The Geography of Avian Influenza: A Spatiotemporal Analysis of Viral Evolution." *Association of American Geographers*, Las Vegas, NV, 3/26/09.
50. Giebultowicz, S.; Root, E. and Emch, M. "Indirect Protection due to Social Networks and Space in a Cholera Vaccine Trial." Poster. *SouthEastern Division of the Association of American Geographers Annual Conference*, Greensboro, NC. 10/24/08.
51. Escamilla, V.; Emch, M.; Feldacker, C.; Yunus, M.; Thiem, VD; and Ali, M. "Local Environmental Drivers of Cholera in Bangladesh and Vietnam." Poster. *SouthEastern Division of the Association of American Geographers Annual Conference*, Greensboro, NC. 10/24/08
52. Akita, Y., Leber, J., Knappett, P., Feighery, J., Band, L, Emch, M, Mailloux, B, Culligan, P, Layton, A, McKay, L, van Geen, A, Serre, M. "Spatial analysis of the distribution of bacterial pathogen indicators across shallow aquifers in Bangladesh," *International Society for Environmental Epidemiology/ International Society of Exposure Analysis*. Pasadena, CA, 10/18/08.



53. Feldacker, C., Escamilla, V., and Emch, M.E. "Protecting Populations: Using Environmental Variables to Predict Cholera in Bangladesh and Vietnam." Poster. *National Science Foundation Annual IGERT PIs Meeting*. Arlington, VA, 5/18/08.
54. Feldacker, C., Escamilla, V., and Emch, M.E. "Protecting Populations: Using Environmental Variables to Predict Cholera in Bangladesh and Vietnam." Poster. *Population Association of America*. Poster Session Award Winner. New Orleans, LA, 4/19/08.
55. Carrel, M., Emch, M., Streatfield, P.K., and Yunus, M. "The Impact of flood control on cholera in Matlab, Bangladesh," *Association of American Geographers*, Boston, MA, 4/19/08.
56. Emch, M.E. and Root, E.D. "Spatial, Environmental, and Social Network Analysis in Vaccine Trials," *Association of American Geographers*, Boston, 4/18/08.
57. Serre, M.L.; Akita, Y.; Escamilla, V.; Emch, M.; Kolovos, A. "Spatial Analysis of Arsenic Exposure and Diarrheal Disease Risk in Bangladesh Related to Population Pressures on Groundwater Resources," *European Geosciences Union*, Vienna, Austria, 4/15/08.
58. Ali, M.; Emch, M.; Acosta, C.; von Seidlein, L.; and Clemens, J. "Geographic Information Systems in Vaccine Efficacy Trials," *Geoinformation Technology for Better Health*, Bangkok, Thailand, 1/15/08.
59. Ali, M.; Emch, M.E.; Yunus, M.; Sack, D.; Lopez, A.; Holmgren, J.; and Clemens, J. "Vaccine Herd Protection of Bangladeshi Infants and Young Children against Cholera: Implications for Vaccine Deployment and Person-to-person Transmission," *United States - Japan Cooperative Medical Science Program's 8th International Conference, (National Institute of Allergy and Infectious Diseases of the U.S. National Institutes of Health)* Austin, TX, 12/8/07.
60. Emch, M.E. "Developing a Cholera Early Warning System Using Environmental Information," *United States - Japan Cooperative Medical Science Program's 8th International Conference, (National Institute of Allergy and Infectious Diseases of the U.S. National Institutes of Health)* Austin, TX, 12/5/07.
61. Ruiz-Moreno, D.; Pascual, M.; King, A.; Emch, M. and Yunus, M. "The Spatio-temporal Dynamics of Endemic Cholera in a Heterogeneous Landscape" *NIH/NSF, Ecology and Evolution of Infectious Disease PI Meeting*, Albuquerque, NM, 12/4/07.
62. Emch, M.E. and vanGeen, A. "Does Arsenic Mitigation in Bangladesh Raise Exposure to Bacterial and Viral Pathogens?" *NIH/NSF, Ecology and Evolution of Infectious Disease PI Meeting*, Albuquerque, NM, 12/4/07.
63. Lutgendorf, C.; Schroeder, J; Smith, G.; Mohler, J.; Emch, M.E. "Prostate Cancer Aggressiveness, Race and Pesticides in North Carolina: The PCaP Geographic Information Study (PCaP-GIS)" *American Public Health Association 135th Annual Meeting*, Washington, DC, 11/05/07.
64. Feldacker, C. and Emch, M.E. "Environmental influences on cholera outbreaks in Bangladesh and Vietnam: Implications for prevention and prediction" *American Public Health Association 135th Annual Meeting*, Washington, DC, 11/06/07.
65. Emch, M.E. "Spatial, Environmental, and Social Network Analysis in Vaccine Trials" *12th International Medical Geography Symposium*, Bonn, Germany, 7/13/07.
66. Emch, M.E. "Bringing Spatial and Environmental Contexts into Population Health: The Case of Vaccine Effectiveness," *Robert Wood Johnson Foundation Health & Society Program Annual Meetings*, Washington, D.C., 5/13/06.
67. Emch, M.E. and Feldacker, C. "Developing a cholera early warning system using environmental information," *Association of American Geographers*, San Francisco, 4/19/07.

68. Emch, M.E. "A comparison between risk areas and neighborhood-level risk factors for two types of bacterial dysentery: Implications for vaccine development," *Association of American Geographers*, Chicago, 3/10/06.
69. Emch, M.E. and Ali, M. "Ecological Correlates of Spatial Heterogeneous Vaccine Efficacy," *11th International Medical Geography Symposium*, Fort Worth, 7/6/05.
70. Emch, M.E. "Using neighborhood-level social, environmental, and spatial information to conduct ecological vaccine trials," Invited Paper for Special Session Entitled "Space, Geography, Neighborhoods and Social Epidemiology: New Methods and Concepts," Joint meeting of the *Society for Epidemiologic Research (SER) and Canadian Society for Epidemiology and Biostatistics*, Toronto. 6/28/05.
71. Emch, M.E.; Ali, M.; and Clemens, J. "Using Spatial Information to Improve Vaccine Trials," *Association of American Geographers*, Denver, 4/5/05.
72. Emch, M.E.; Ali, M.; and Clemens, J. "Spatial Confounders and Effect Modifiers in Phase III Vaccine Trials," *GIS in Action*, Portland, Oregon. 5/13/04.
73. Emch, M.E.; Ali, M.; and Clemens, J. "Spatial Analysis in Vaccine Trials: Heterogeneous Efficacy and Effect Modifiers," *Association of American Geographers*, Philadelphia, 3/16/04.
74. Emch, M.E.; "Geographical Analysis in Cholera Research," Invited paper for *United States - Japan Cooperative Medical Science Program's 8th International Conference on Emerging Infections in the Pacific Rim*, Dhaka, Bangladesh, 12/11/03.
75. Emch, M.E.; Ali, M; and Clemens, J. "Spatial Analysis in Vaccine Trials: Spatially Heterogeneous Efficacy and Spatial Effect Modifiers," *10th Asian Conference on Diarrhoeal Diseases and Nutrition*, Dhaka, Bangladesh, 12/07/03.
76. Emch, M.E.; Ali, M; and Clemens, J. "Geographical Analysis in Vaccine Efficacy Trials: Spatial Confounders, Effect Modifiers, and Herd Immunity Measurement," *Association of Pacific Coast Geographers*, Portland, 9/20/03.
77. Emch, M.E. "Satellite Image Processing Methods for Measuring Mangrove Forest Cover Change in Bangladesh from 1989-2000," *Association of American Geographers*, New Orleans, 3/7/03.
78. Emch, M.E. "Measuring Land-Use/Cover Change in the Toledo District, Belize from 1975-2000 Using Landsat Imagery," *American Society of Photogrammetry and Remote Sensing and American Congress of Surveying and Mapping*, Washington, D.C., 4/23/02.
79. Emch, M.E. "Geographical Analysis for Vaccine Trials," *Association of American Geographers*, Los Angeles, 3/21/02.
80. Emch, M.E. and Yasmin, N. "Measuring Water Quality in Iowa Lakes Using Satellite Imagery," *11th Annual Iowa Space Grant Consortium*, National Aeronautics and Space Administration, Marshalltown, Iowa, 12/7/01.
81. Emch, M.E. and Peterson, M. "A Comparison of Maximum Likelihood and Sub-Pixel Classifiers for Measuring Mangrove Forest Cover in the Sundarbans of Bangladesh," *5th Biennial Iowa GIS Conference*, University of Iowa, 10/05/01.
82. Quinn, J. and Emch, M.E. "Using Remote Sensing Methods to Assess Land Cover Change: A Case Study of Casey Lake Watershed, Tama County, Iowa," *5th Biennial Iowa GIS Conference*, University of Iowa, 10/04/01.
83. Johnson, R. and Emch, M.E. "STORM Remote Sensing Project Satellite Image Distribution," *5th Biennial Iowa GIS Conference*, University of Iowa, 10/04/01.
84. Suckling, K. and Emch, M.E. "Factors Affecting Groundwater Arsenic Contamination in Bangladesh," *5th Biennial Iowa GIS Conference*, University of Iowa, 10/04/01.

85. Emch, M.E. "Using Radar and Optical Image Processing to Measure Mangrove Deforestation in the Sundarbans of Bangladesh," *American Society of Photogrammetry and Remote Sensing*, St. Louis, 4/25/01.
86. Emch, M.E. and Strauss, T. "Using GPS Survey Data and Satellite Imagery for Rural Transportation Planning in Bangladesh," *American Congress of Surveying and Mapping Annual Convention*, Las Vegas, NV, 3/20/01.
87. Emch, M.E. "Local-Level Anthropogenic and Environmental Risk Factors for Groundwater Arsenic Contamination in Bangladesh," *Association of American Geographers*, New York, 03/01/01.
88. Emch, M.E. "Deforestation in Bangladesh," *American Society of Photogrammetry and Remote Sensing*, Washington, D.C., 5/22/00.
89. Emch, M.E. "Using a Geographic Information Science Approach to Monitor Floods and Disease in Bangladesh," *Information Technologies in Education: Problems and Prospects*, St. Petersburg, Russia, 5/15/00.
90. Emch, M.E. "Relationships Between Flood Control and Disease in Bangladesh," *Association of American Geographers*, Pittsburgh, 4/5/00.
91. Ali, M.; Emch, M.E.; Tofail, F.; and Baqui, A. "Implications of Health Care Provision on Acute Lower Respiratory Infection Mortality in Bangladeshi Children," *International Health Geographics Conference*, Baltimore, 3/18/00.
92. Emch, M.E. "Infrastructure Planning in Rural Bangladesh: Integrating Global Positioning Survey Data, Population Census Information, Digital Elevation Models, and Radar Imagery," *American Congress of Surveying and Mapping Annual Convention*, Portland, Oregon, 3/15/99.
93. Emch, M.E. "Spatial and Environmental Risk Factors for Diarrheal Disease in Matlab, Bangladesh," *Geographic Information Systems in Public Health*, San Diego, 8/18/98.
94. Hoque, M.; Emch, M.; and Islam, A. "Potential Applications of Remote Sensing in the Coastal Environmental Management of Bangladesh," *International Geoscience and Remote Sensing Symposium*, Singapore, 8/7/97.
95. Emch, M.E. "The Use of Spatial Autocorrelation in Environmental Health Modelling: A Methodological Exploration," *Symposium on GIS in Medical Geography*, The British Council, Dhaka, Bangladesh, Sponsored by University of Durham (United Kingdom) and Dhaka University, 12/5/96.
96. Emch, M.E. "The Resurgence of Kala-azar in Bangladesh and its Relationship with the Flood Action Plan," *Association of American Geographers*, Chicago, 3/14/95.
97. Emch, M.E. "GIS Modelling of Watery Diarrheal Disease in Rural Bangladesh," *International Symposium on Computer Mapping in Epidemiology and Environmental Health*, Tampa, Florida, 2/12/95.
98. Emch, M.E. "Agricultural Development in Southern Belize," *Association of American Geographers*, San Diego, 4/20/92.

#### Invited Colloquia, Keynotes, and Plenaries

1. Emch, M. "Incorporating geographic context into cholera and malaria vaccine trials," Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, 5/28/18.
2. Emch, M. "Incorporating geographic context into cholera and malaria vaccine trials," Kintampo Health Research Centre, Kintampo, Ghana, 5/23/18.

3. Emch, M. "Incorporating geographic context into cholera and malaria vaccine trials," Centre de Recherches Médicales de Lambaréné, Albert Schweitzer Hospital, Lambaréné, Gabon, 5/16/18.
4. Emch, M. "Incorporating geographic context into cholera and malaria vaccine trials," Gillings School of Public Health, University of North Carolina at Chapel Hill, Vaccine Epidemiology Lecture, 4/16/18.
5. Emch, M. "Publishing in Scientific Journals: Capacity Building Session," 2017 UNC-South China International Summit for STD Prevention and Control & Expert Consultation on Advancing Implementation Research on Syphilis, HIV, and Hepatitis in Asia, Guangzhou, China, 9/26/17.
6. Emch, M. "Integrating spatial and genetic analysis: The case of avian influenza," Expert meeting organized by the Communicable Disease Unit, Bureau of Epidemiology, Ministry of Public Health, Thailand. Topic: Preparing for the next avian influenza pandemic and how to improve response by using spatial-temporal analysis of infectious diseases dynamics, Cha-am, Thailand, 7/24-25/17.
7. Emch, M. "Landscape genetics of malaria in the Democratic Republic of Congo: Drug and diagnostic resistance," North South University, Dhaka Bangladesh, 7/19/17.
8. Emch, M. Invited Talk, "Landscape ecology impacts on malaria and cholera," One Health Intellectual Exchange, North Carolina One Health Collaborative, NCBC Intellectual Exchange Group, 1/31/17.
9. Emch, M. Invited Talk, "Incorporating geographic context into intervention evaluation: cholera and malaria vaccine trials," School of Public Health, University of the Witwatersrand, Johannesburg, South Africa, 8/19/16.
10. Emch, M. Invited Talk, "Incorporating geographic and environmental contexts into disease ecology studies," Department of Geography, University of the Witwatersrand, Johannesburg, South Africa, 8/17/16.
11. Emch, M. Invited Talk, "Incorporating geographic context into epidemiology studies: Example using the Matlab, Bangladesh HDSS," Agincourt Health and Demographic Surveillance System field site, School of Public Health, University of the Witwatersrand, Johannesburg, South Africa, 8/12/16.
12. Emch, M. Invited Talk, "Incorporating geographic and environmental contexts into disease ecology studies" East China Normal University, Shanghai, China, 7/18/16.
13. Emch, M. Invited Talk, "Spatial components of sexually transmitted infections: Spatial cluster detection and incorporating geographic context in disease risk analysis," Guangdong Provincial STD Control Center, Number Eight Infectious Diseases Hospital, Guangzhou, China, 7/8/16.
14. Emch, M. Invited Plenary on "Spatializing Health: Geography, GI Science and Urban Health," International Society for Urban Health & American Association of Geographers Joint Meetings, San Francisco 4/2/16.
15. Emch, M. Invited Talk, "Population, Place, and Inequality" Robert Wood Johnson Foundation Health and Society Mini-Conference, Columbia University, 2/12/16.
16. Emch, M. Colloquium, "Incorporating geographic context into cholera and malaria vaccine trials." *International Medical Geography Symposium*, Geospatial Forum, Center for Geospatial Analytics, North Carolina State University, Raleigh, 1/22/16.
17. Emch, M. "Spatio-temporal Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach," Department of Zoology, University of Oxford, UK, 11/4/15.
18. Emch, M. "Incorporating geographic context into randomized controlled trials: The case of the oral cholera vaccine" Universidad Nacional Autónoma de Nicaragua, Leon, Nicaragua, 3/25/15.

19. Emch, M. "Landscape Genetics of Malaria in the Democratic Republic of Congo," Mini-conference on Geographic Perspectives on Health, University of Buffalo, 3/6/15.
20. Emch, M. "Incorporating geographic context into randomized controlled trials: The case of the oral cholera vaccine" Carolina Population Center, University of North Carolina at Chapel Hill, 10/24/14.
21. Emch, M. "Spatial Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach" PoPMED Forum, College of Veterinary Medicine, North Carolina State University, 2/24/14.
22. Emch, M. "GIS in Public Health: Spatial Methods for Infectious Disease Studies" Department of Health Behavior. University of North Carolina at Chapel Hill, 2/24/14.
23. Emch, M. "Integrating Spatial and Genetic Analysis: The Case of Malaria in the Democratic Republic of Congo" Institute for Population Research, The Ohio State University, 11/12/13.
24. Emch, M. "Spatial Analysis in Infectious Disease Research" Sun Yat-Sen University, Guangzhou, China, 6/24/13.
25. Emch, M. and Carrel, M. "Integrating Spatial and Genetic Analysis: The Case of Avian Influenza" Anhui Agricultural University, Hefei, China, 3/19/13.
26. Emch, M.; Perez-Hedrich, C.; and Janko, M. "DHS GPS Data Use in Practice" IFC International, Washington, DC, 6/10/13.
27. Emch, M. "Integrating the Effects of Space, Environment, and Social Networks in Cholera Vaccines" Oakridge National Labs, TN, 3/8/13.
28. Emch, M. Spatio-temporal Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach. Geography Department Colloquium Series, University of Tennessee, 3/7/13.
29. Emch, M. Spatio-temporal Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach. Geography Department Colloquium Series, University of North Carolina at Charlotte, 2/8/13.
30. Emch, M. "Integrating the Effects of Space, Environment, and Social Networks in Cholera Vaccines" Challenges in Modeling the Spatial and Temporal Dimensions of the Ecology of Infectious Diseases. Workshop Sponsored by NSF EEID Program, The Ohio State University, 9/18/12.
31. Emch, M. "Finding a Drinking Water Supply for Rural Bangladesh that Reduces Exposure to both Arsenic and Diarrheal Diseases" Harvard School of Public Health's Speaker Series in Infectious Disease Epidemiology, 3/19/12.
32. Emch, M. "Finding a Drinking Water Supply for Rural Bangladesh that Reduces Exposure to both Arsenic and Diarrheal Diseases" Geography Department Colloquium Series, University of North Carolina at Chapel Hill, 12/2/11.
33. Emch, M. "Finding a Drinking Water Supply for Rural Bangladesh that Reduces Exposure to both Arsenic and Diarrheal Diseases" Center for Studies in Demography and Ecology, University of Washington, 11/18/11.
34. Emch, M. "Finding a Drinking Water Supply for Rural Bangladesh that Reduces Exposure to both Arsenic and Diarrheal Diseases" Geography Department Colloquium Series, University of Canterbury, New Zealand, 7/28/11.
35. Emch, M. "Maps, Medicine, and Microbes: Predicting and Preventing Cholera in Bangladesh" Invited Lecture, The GeoHealth Laboratory, University of Canterbury, New Zealand, 6/7/11.
36. Emch, M. "Fecal Contamination of Shallow Tubewells in Bangladesh Inversely Related to Arsenic" Invited Lecture, The University of New South Wales, Canberra, 5/19/11.

37. Emch, M. "Maps, Medicine, and Microbes: Predicting and Preventing Cholera in Bangladesh" *National Centre for Epidemiology & Population Health, Distinguished Speaker Seminar*, The Australian National University, Canberra, 5/19/11.
38. Emch, M. "Finding a Drinking Water Supply for Rural Bangladesh that Reduces Exposure to both Arsenic and Diarrheal Diseases" Telethon Institute for Child Health Research Keynote Seminar Series, University of Western Australia, 5/17/11.
39. Emch, M.E. Invited Lecture, "Medical Geography and Spatial Epidemiology" Human-Animal Interface Symposium: Current challenges for influenza prevention and control in China, Pathogen Diagnostic Center, Shanghai Pasture Institute, Shanghai, China, 7/27/10.
40. Emch, M.E. Colloquium, "Maps, Medicine and Microbes: Predicting and Preventing Cholera in Bangladesh" Department of Geography, University of Buffalo, 3/16/10.
41. Emch, M.E. Colloquium, "Spatial and Genetic Clustering of Avian Influenza in Vietnam" Department of Genetics, Dartmouth University, 10/28/09.
42. Emch, M.E. Invited Lecture, "Geographical Analysis in Vaccine Trials: Concepts and Case Studies," Great Ideas Lecture Series at the Friday Center, University of North Carolina at Chapel Hill, 4/23/09.
43. Emch, M.E. The Anderson Lecture (Endowed Annual Lecture), "The Geography of Vaccine Trials: Incorporating Spatial, Social, and Environmental Analysis" University of Florida, 2/24/09.
44. Emch, M.E. Colloquium, "Cholera and Environment Across Scales" Department of Geography, University of Florida, 2/23/09.
45. Emch, M.E. and Carrel, M. Colloquium, "Integrating Spatial and Genetic Analysis in Medical Geography: The Case of Avian Influenza" Emerging Pathogens Institute, University of Florida, 2/25/09.
46. Emch, M.E. Initiative in Population Research Lecture, "Spatial, Environmental, and Social Network Analysis in Vaccine Trials," Initiative in Population Research, The Ohio State University, 1/6/09.
47. Emch, M.E. Colloquium, "'What about Geography and Health: Is Medical Geography Realizing Its Promise?'" Department of Geography, The Ohio State University, 1/6/09.
48. Emch, M.E. Invited Lecture, "Spatial, Environmental, and Social Network Analysis in Vaccine Trials." Epidemiology Division, National Institute of Environmental Health Sciences, 1/14/08.
49. Emch, M.E. Colloquium, "Environmental and Social Network Analysis in Vaccine Trials." Department of Geography, University of Buffalo, 11/02/07.
50. Emch, M.E. Colloquium, "Local Environmental Drivers of Cholera in Bangladesh and Vietnam." IGERT Program, National Center for Geographic Information and Analysis, University of Buffalo, 11/02/07.
51. Emch, M.E. Invited Lecture, "Spatial, Environmental, and Social Network Analysis in Vaccine Trials." Department of Health Behavior and Health Education, University of North Carolina at Chapel Hill, 10/31/07.
52. Emch, M.E. Invited Lecture, "Predicting and Preventing Cholera Using Environmental Information," University of Maine, 10/26/07.
53. Emch, M.E. Invited Lecture, "Developing a Cholera Early Warning System Using Environmental Information derived from Satellites," *Scientific Forum*, International Centre for Diarrhoeal Disease Research, Bangladesh, Dhaka, 5/14/07.
54. Emch, M.E. Colloquium, "A Medical Geographic Approach for Measuring Herd Immunity in Vaccine Trials." Department of Geography, University of North Carolina at Greensboro, 4/13/07.

55. Emch, M.E. Invited Lecture, "A Spatial Epidemiological Approach for Measuring Herd Immunity in Vaccine Trials." Center for Infectious Disease Conference-Grand Rounds, University of North Carolina at Chapel Hill, 2/23/07.
56. Emch, M.E. Colloquium, "Bringing Spatial and Environmental Contexts into Population Health: The Case of Vaccine Effectiveness." Carolina Population Center, University of North Carolina at Chapel Hill, 9/15/06.
57. Emch, M.E. Invited Lecture, "Cholera Prevention and Prediction Using Spatial Analysis," South China Agricultural University, 2/21/06.
58. Emch, M.E. Invited Lecture, "Maps, Medicine, and Microbes: Predicting and Preventing Cholera," H.O. Burdick Memorial Lecture in Biology, Alfred University, 2/14/06.
59. Emch, M.E. Colloquium, "Using a GIS to Conduct Ecological Phase III Vaccine Trials: Herd Immunity and Neighborhood-level Correlates of an Oral Cholera Vaccine," Department of Geography Colloquium Series, University of Connecticut, 10/14/05.
60. Emch, M.E. Colloquium, "The Human Ecology of Land Cover Change in the Toledo District, Belize," Department of Geography Colloquium Series, Miami University, 10/7/05.
61. Emch, M.E. Colloquium, "Spatial Analysis in Vaccine Evaluation: Neighborhood Effects and Herd Immunity Measurement in a Phase III Cholera Trial in Rural Bangladesh," Jointly sponsored Department of Biology and Department of Geography Colloquium, Miami University, 10/6/05.
62. Emch, M.E. Invited Lecture, "Herd Immunity Conferred by Killed Oral Cholera Vaccines in Bangladesh: A Reanalysis," Quantitative Methods in the Social Sciences Seminar Series, Institute for Social and Economic Research and Policy, Columbia University, 9/26/05.
63. Emch, M.E. Invited Lecture, "Enteric Diseases, Water, and Sanitation in Asia and Africa," Columbia University seminar in Engineering for Developing Communities, 2/17/05.
64. Emch, M.E. Colloquium, "Developing a Cholera Early Warning System," International Research Institute (IRI) for Climate Prediction, The Earth Institute, Columbia University, 2/9/05.
65. Emch, M.E. Colloquium, "Using Spatial Information to Improve Vaccine Trials," *New York Public Health Colloquium Series*, sponsored by New York Department of Health and National Center for Disaster Preparedness, Mailman School of Public Health, Columbia University, 2/7/05.
66. Emch, M.E. Invited Lecture, "Cholera Across Scales: Oceanic Links to Climate and Local Estuarine Influences," National Institute of Hygiene and Epidemiology, Ministry of Health, Hanoi, Vietnam, 1/21/05.
67. Emch, M.E. Invited Lecture, "Remote Sensing in Community Growth," *2<sup>nd</sup> Annual Course Creation Fellows Symposium*, Institute for Advanced Education in Geospatial Science, 6/11/03.
68. Emch, M.E. Colloquium, "Satellite Image Processing Methods for Measuring Mangrove Forest Cover Change in Bangladesh from 1989-2000," *Portland State University GIS Remote Sensing Series*, 2/28/03.
69. Emch, M.E. Invited Lecture, "Geographical Analysis in Cholera Risk Assessment and Vaccine Research," Korea National Institute of Health, 1/20/03.
70. Emch, M.E. Colloquium, "Land-use Land-cover Change in the Toledo District, Belize," *Department of Geography Colloquium Series*, Portland State University, 11/20/02.
71. Emch, M.E. Invited Lecture, "Remote Sensing of Environment," *1<sup>st</sup> Annual Course Creation Fellows Symposium*, Institute for Advanced Education in Geospatial Science, 6/4/02.
72. Emch, M.E. Colloquium, "Using Geographic Information Systems and Satellite Remote Sensing for Health Research," International Vaccine Institute, Seoul, Korea, 6/12/01.
73. Emch, M.E. Invited Lecture, "Medical Geography: Theory and Methods," Department of Geography, Seoul National University, 6/8/01.

74. Emch, M.E. Colloquium, "Relationships Between Flood Control, Kala-azar, and Diarrheal Disease in Bangladesh," *Department of Geography Colloquium Series*, The University of Northern Iowa, 10/23/00.
75. Emch, M.E. Colloquium, "Infrastructure Planning and Environmental Monitoring In Rural Bangladesh: A Geographic Information Science Approach," *Department of Geography Colloquium Series*, The University of Northern Iowa, 10/11/99.
76. Emch, M.E. Colloquium, "Geographic Information Systems and Remote Sensing Applications in the Earth Sciences," *Department of Earth Science Colloquium Series*, The University of Northern Iowa, 03/29/99.
77. Emch, M.E. Colloquium, "Environmental Risk Factors For Cholera in Bangladesh," *Department of Geography Colloquium Series*, The University of Iowa, 11/20/98.
78. Emch, M.E. Colloquium, "Geographic Information Systems in Medical Research and Program Management," *Interdivisional Forum*, International Centre for Diarrhoeal Disease Research, Bangladesh, Dhaka, 5/93.
79. Emch, M.E. Invited Lecture, "GIS Applications for Analyzing the 1993 Epidemic of Vibrio Cholera 0139 Bengal," Community Health Division, International Centre for Diarrhoeal Disease Research, Bangladesh, Dhaka, 10/93.

#### Other Talks

1. Emch, M.E. Invited Lecture, "Malaria: What it is, where it is, how people get it, and how to avoid it," Carborro High School, Carborro, NC, 10/23/14
2. Emch, M.E. Invited Lecture, "Water-borne Diseases," Smith Middle School, Chapel Hill, NC, 10/8/12.
3. Emch, M.E. Invited Speaker, "Malaria Surveillance," United States Senate. World Malaria Day Event Hosted by the Senate Working Group on Malaria, Washington, D.C., 4/25/12.
4. Emch, M.E. Invited Lecture, "Water-borne Diseases," Smith Middle School, Chapel Hill, NC, 11/2/11.

### **TEACHING, MENTORING AND CURRICULAR ACHIEVEMENTS**

#### Courses

(Note: present course syllabi at [emchcourses.web.unc.edu/](http://emchcourses.web.unc.edu/))

- Geography of Health and Disease Seminar (GEOG 805), University of North Carolina at Chapel Hill, Spring 2012.
- Geographic Information Systems for Public Health (GEOG 541), University of North Carolina at Chapel Hill, Fall 2006, Spring 2007, Fall 2007, Spring 2008, Spring 2009, Fall 2011, Spring 2013, Spring 2014.
- Medical Geography (GEOG 445), University of North Carolina at Chapel Hill, Fall 2011, Fall 2012, Fall 2017.
- Research Design (GEOG 703), University of North Carolina at Chapel Hill, Fall 2008, Fall 2009, Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Spring 2018.
- Neighborhoods and Health (GEOG 542) University of North Carolina at Chapel Hill, Spring 2007, Spring 2008, Spring 2012, Fall 2016.
- Geographic Information Systems I: Introduction to GIS (GEOG 488/588), Portland State University, Winter 2002, Fall 2002, Spring 2003, Fall 2003.



- Geographic Information Systems II: GIS Applications (GEOG 492/592), Portland State University, Spring 2002, Winter 2003, Winter 2004, Spring 2004.
- Satellite Digital Image Analysis (GEOG 481/ 581), Portland State University, Spring 2002, Spring 2003, Winter 2004.
- Satellite Image Classification and Change Detection (GEOG 482/582), Portland State University, Fall 2002, Spring 2004.
- Global Positioning System for Mapping (GEOG 489/589), Portland State University, Fall 2003.
- Maps and Geographic Information (GEOG 380), Portland State University, Winter 2003.
- Geographic Information Systems I, University of Northern Iowa, Fall 1998,1999, 2000.
- Geographic Information Systems II, University of Northern Iowa, Spring 1999, 2000, 2001.
- Advanced GIS Seminar in Geoprocessing, University of Northern Iowa, Fall 1999.
- Remote Sensing of the Environment, University of Northern Iowa, Spring 1999, 2000, 2001.
- Global Positioning Systems, University of Northern Iowa, Fall 2000, 2001.
- Advanced Remote Sensing Seminar in Satellite Image Processing, University of Northern Iowa, Fall 2001.
- Advanced Geographic Information Systems, University of Connecticut, Spring 1998.
- Application Issues in Geographic Information Systems, University of Connecticut, Spring 1998.
- Introduction to Geographic Information Systems, University of Connecticut, Fall 1997, Summer 1998.

Postdoctoral, Graduate, and Undergraduate Committees: University of North Carolina at Chapel Hill

**Postdoctoral**

- Leah Frerichs, PhD, NIH KO1, 2017-21 (secondary mentor/ senior advisor).
- Debs Ghosh, PhD, NIH KO1 (NIDA), Connecting People, Places, and Barriers: The effect of these connections on adherence and retention in care for HIV positive drug users, 2014-19 (on mentorship team).
- Pam Jagger, PhD, NIH KO1 (NICHD), Population, Environment and Health Dynamics of Biomass Fuel Use in Sub-Saharan Africa, 2013-16 (mentor).
- Pam Jagger, PhD, NIH Fogarty Global Health Fellows Program 2013-2014 (mentor).
- Wen Chen, PhD, NIH Fogarty Global Health Fellows Program 2013-2014 (co-mentor with Joe Tucker) at School of Public Health, Sen Yat-sen University, Guangzhou China.
- Veronica Escamilla, PhD, NIH T32 (NIAID) on sexually transmitted infections 2012-2014 (co-mentor with Bill Miller).
- Carolina Perez-Heydrich, Ph.D., NIH T32 (NIEHS) on environmental biostatistics 2010-13 (co-mentor with Amy Herring).
- Alisa Alker, M.D., PhD, NIH Pathogenesis Training Program in Infectious Diseases 2010-2013 (on mentorship team).
- Sylvia Becker-Dreps, M.D., NIH KO1 (NIAID), Preliminary Effectiveness Analysis of Universal Rotavirus Immunization, Nicaragua, 2009-10 (on mentorship team).
- Christopher Hurt, M.D., NIH KL2 Multidisciplinary Clinical Research Career Development Program, 2010-12 (on mentorship team).
- Jonathon Juliano, M.D., NIH KL2 Multidisciplinary Clinical Research Career Development Program, 2008-10 (on mentorship team).

### **Graduate Student Advisor**

- Katerina Brandt, Ph.D. (in progress) Geography
- Cyrus Sinai, Ph.D. (in progress) Geography
- Varun Goel, Ph.D. (in progress) Geography.
- Corinna Keeler, Ph.D. (ABD) Geography.
- Mark Janko, Ph.D. (2017) Geography.
- Jennifer Winston, Ph.D. (2014) Geography. [now in research position at the University of North Carolina]
- Jill Braly, M.A. (2013) Geography.
- Janey Messina, Ph.D. (2011) Geography. [now Associate Professor, Oxford University]
- Veronica Escamilla, Ph.D. (2011) Geography. [now in research position at the University of North Carolina]
- Jianyong Wu, Ph.D. (2011) Environment Science and Engineering, School of Public Health. (Co-advisor with Jill Stewart), [now in research position at the Environmental Protection Agency]
- Sophia Giebultowicz, M.A. (2010) Geography.
- Maggie Carrel, M.A. (2007) Ph.D. (2011) Geography. [now Assistant Professor, University of Iowa]
- Elisabeth Root, Ph.D. (2009) Geography, [now Associate Professor, Ohio State University]

### **Graduate Student Committee Member**

- Monica Jimenez, Ph.D. (in progress) Epidemiology, School of Public Health.
- Molly Deutsch-Feldman, Ph.D. (in progress) Epidemiology, School of Public Health.
- Sujatro Chakladar, Ph.D. (in progress) Epidemiology, School of Public Health.
- Doug Hopping, Ph.D. (2018) Geography.
- Brian Barkley, PhD. (2018) Biostatistics, School of Public Health.
- Ryan Leighton, MS (2018) Environmental Sciences and Engineering, School of Public Health.
- Kristin Hampton, Ph.D. (in progress) Epidemiology, School of Public Health.
- Emily Werder, Ph.D. (2017) Epidemiology, School of Public Health.
- Kelly Houck, Ph.D. (2017) Anthropology.
- Gabriela Arandia, Ph.D. (2017) Health Behavior, School of Public Health.
- Maia Call, Ph.D. (2017) Geography.
- Amy Huber, Ph.D. (2017) Epidemiology, School of Public Health.
- Pawinee Doung-ngern, Ph.D. (2016) Epidemiology, School of Public Health.
- Katie Holliday, Ph.D. (2016) Epidemiology, School of Public Health.
- Matthew Ryan, MPH (2016) Epidemiology.
- William Miller, Ph.D. (2015) Epidemiology, School of Public Health.
- Jabulani Ncayiyana, Ph.D. (2015) Epidemiology, School of Public Health.
- Maggie Kovach, Ph.D. (2015) Geography.
- Gretchen Cowman DrPH (2015) Department of Health Policy and Management, School of Public Health.
- Alice Wang, Ph.D. (2015) Environmental Sciences and Engineering, School of Public Health.
- John Wallace, Ph.D. (2015) Epidemiology, School of Public Health.
- Joseph Rigdon, Ph.D. (2015) Biostatistics, School of Public Health.
- Anna Cope, Ph.D. (2014) Epidemiology, School of Public Health Public Health.
- Molly Rosenberg, Ph.D. (2014) Epidemiology, School of Public Health.

- Genee Smith, Ph.D. (2013) Epidemiology, School of Public Health.
- Michelle Sever, Ph.D. (2012) Epidemiology, School of Public Health.
- Stephanie Moultrie Reed, Ph.D. (2012), Maternal and Child Health School of Public Health.
- Jonathon Daw, Ph.D. (2011) Sociology.
- Brooke Hoots, Ph.D. (2011) Epidemiology, School of Public Health.
- Yasuyuki Akita, Ph.D. (2010) Environmental Sciences and Engineering, School of Public Health.
- Amy Kalkbrenner, Ph.D. (2009) Epidemiology, School of Public Health.
- Caryl Feldacker, Ph.D. (2009) Health Behavior & Health Education, School of Public Health.
- Darren Dahly, Ph.D. (2009) Nutritional Epidemiology, School of Public Health.
- Susan Marshall, Ph.D. (2009) Epidemiology, School of Public Health.
- Brian Maskery, Ph.D. (2009) Environmental Sciences and Engineering, School of Public Health.
- Kim Porter, MPH (2008) Epidemiology, School of Public Health.
- Sheela Sinharoy, MPH (2008) Maternal and Child Health, School of Public Health.
- Ashley Ward, M.A. (2007) Medical Geography.

#### **Advisor for NSF Population and Environment IGERT**

- Darren Dahly, Nutritional Epidemiology, School of Public Health, 2006-07; Caryl Feldacker, Health Behavior & Health Education, School of Public Health, 2006-09; Jelena Cali, Nutrition, School of Public Health, 2008-09; Elisabeth Root, Medical Geography, 2007-09; Maggie Carrel, Medical Geography, 2007-11; Sophia Giebultowicz, Medical Geography, 2007-11; Veronica Escamilla, Medical Geography, 2007-11; Jane Messina, Medical Geography, 2008-11; Jennifer Winston, Medical Geography, 2009-2011.

#### **Advising for Undergraduate Honors Thesis**

- Griffin Bell, BSPH (in progress)
- Chloe Liu, B.A. (Advisor-2013) Received the Arnold D. Kaluzny Award for Excellence in Undergraduate Research
- Mehrin Islam, B.A. (Committee Member-2012)
- Cameron Taylor, B.A. (Advisor-2010)
- Carlie Blake, B.A. (Advisor-2010).

#### **Advising for Undergraduate C-START (Carolina Students Taking Academic Responsibility through Teaching)**

- Maya Mahin, Course title: International Health and Human Rights (Advisor-2011-12)

#### **Advising for Undergraduate Internships**

- Katherine Combs, Carolina Population Center Summer Intern, 2017.
- Anna Gallerani, Carolina Population Center Summer Intern, 2016.
- Kwasi Perry, Carolina Population Center Undergraduate IGERT Intern, 2007-8.
- Jonathan Jackson, Carolina Population Center Undergraduate IGERT Intern, 2007-8.

#### Graduate Student Committees: Other Universities

#### **Thesis Advisor**

Rhonda Robb, M.S. (2004) Geography, Portland State University; Rodney Garland, M.S. (2004) Geography, Portland State University; Marc Peterson, M.A. (2001) Geography, University of Northern Iowa; James Quinn, M.A. (2001) Geography, University of Northern Iowa.

### **Committee Member**

Chantel Sloan, Ph.D. (2009) Genetics, Dartmouth College; Shonene Scott, M.S. (2004) Biology, Portland State University; Leslie O'Rourke, M.S. (2004) Anthropology, Portland State University; Mischa Connine, M.S. (2003), Biology, Portland State University; John Gunn, M.S. (2002), Geography, Portland State University; Alton Straub, Ph.D. (2002), Environmental Sciences and Resources, Portland State University; Ahmed M. El-Geneidy, Ph.D. (2002), Urban Studies and Planning, Portland State University; Jake Griffiths, M.S. (2002) Geology, Portland State University; Karla Suckling, M.A. (2001), Geography, University of Northern Iowa.

## **GRANTS AND AWARDS**

### Awarded

1. Bailey, J (P.I.), Emch, M (P.I.), Juliano, J (CoI), Kamthunzi, P (CoI), Hudgens, M (CoI) Impacts of Environment, Host Genetics and Antigen Diversity on Malaria Vaccine Efficacy, National Institute of Allergies and Infectious Disease, National Institutes of Health (NIAID), 1R01-AI137410-01, \$3,632,091, 2018-22.
2. Jagger, P (P.I.), Emch, M (CoPI), Entwisle, B (CoPI). PIRE: Confronting Energy Poverty: Building an Interdisciplinary Evidence Base, Network, and Capacity for Transformative Change, National Science Foundation, OISE-1743741, \$4,790,728, 2018-2022.
3. Emch, M (P.I.), Sobsey, M (CoPI), Islam, (CoPI), Yunus, M (CoPI). Finding Safe Drinking Water to Mitigate Arsenic Contamination: Tube Wells, Storage, and Diarrhea. National Science Foundation, BCS-1560970, \$419,999, 2016-2019.
4. Emch, M. (P.I.) Research Experience for Undergraduates: Finding Safe Drinking Water to Mitigate Arsenic Contamination: Tube Wells, Storage, and Diarrhea. National Science Foundation, REU, \$7000, 2017-19.
5. Becker-Dreps, S. (P.I.), Emch, M (CoI), Bucardo, F (CoI), Vinje, J (CoI), Bowman, N (CoI), Baric, R (CoI), Sobsey, M (CoI), Hudgens, M (CoI), Vilchez, S (CoI), Gilman, R (CoI), Bern, C (CoI). Natural history, immunity, and transmission patterns of sapovirus in a Nicaraguan birth cohort, National Institute of Allergies and Infectious Disease, National Institutes of Health (NIAID), 1R01AI127845-01, \$3,365,436, 2016-2021.
6. Emch, M. (P.I.) and Meshnick, S. (CoP.I). Spatio-Temporal Patterns of Drug Resistant Malaria in the Democratic Republic of Congo. National Science Foundation, BCS-1339949, \$344,869, 2013-2018.
7. Reich, B. (P.I.-NC State), Emch, M (P.I. of subcontract to UNC) M. Laber, E, Meshnick, S. Innovation in Analytics: A spatiotemporal recommendation engine for malaria control. Round 17 of Grand Challenges Explorations, Bill and Melinda Gates Foundation, \$100,000, 2017-2018.
8. Scott, L. (PI- University of Witwatersrand), Van Rie (CoI), Emch (CoI). Combining Xpert and GIS to identify areas of high tuberculosis transmission. National Institute of Allergies and Infectious Disease, National Institutes of Health (NIAID), 1R21AI11601501, \$222,424, 2015-18.
9. Meshnick, S. (P.I.) and Emch, M (CoI). Epidemiological and Spatial Models of Malaria Transmission. National Institute of Allergies and Infectious Disease, National Institutes of Health (NIAID), 5R01AI107949 02, \$ 2,243,272(direct), 2014-19.

10. Wong W, Tucker JD, Man HK, Emch M, Li-Gang Y, Yan-ping Z. “To Determine Prevalence and Contextual Risk Factors of Sexually Transmitted Infections in Hong Kong.” Grant awarded to University of Hong Kong by the Health and Medical Research Fund, Research Fund Secretariat, Food and Health Bureau, The Government of the Hong Kong Special Administrative Region. Project #13121242, HK\$1,280,580, 2013-2016.
11. Emch, M. (PI). Spatio-temporal dynamics and environmental risk factors of norovirus in León, Nicaragua. UNC Institute for Global Health & Infectious Diseases (IGHID) and the UNC Program in Nicaragua (UNC ProNica) Research Pilot Funding Program, \$3405, 2014-15.
12. Emch, M. (P.I.) and Meshnick, S. (CoP.I.). Research Experience for Undergraduates: Spatio-Temporal Patterns of Drug Resistant Malaria in the Democratic Republic of Congo. National Science Foundation, REU, \$7000, 2014-2017.
13. Fang, G (PI), Bailey, SC (PI), Brookhart, A (CoI), Emch, M (CoI). National Health Literacy Mapping to Inform Healthcare Policy, National Institutes of Health, R01AG046267-02, \$1,653,067 (total), 2014-17.
14. Pettifor, A (PI), van Der Horst C (PI), Adair L (CoI), Hightow-Weidman L (CoI), Barrington C (CoI), Miller W (CoI), Emch M (CoI), Hudgens M (CoI), Maman (CoI), Potter C (CoI), Ramaswamy R (CoI), Speizer I (CoI), Thirumurthy H (CoI). UNC Wits AIDS Implementation Research and Cohort Analyses Training Grant. NIH Fogarty International Center for Advanced Study in the Health Sciences, National Institutes of Health, 5D43TW009774 \$1,503,040. 2014-2019.
15. Hoffman, I. (P.I.); Emch, M. (CoI); Martinson, F. (CoI); Demster, D. (CoI); Krysiak, R. (CoI); Mofolo, I. (CoI); Sungitsa, M. (CoI) MAL55 Phase III clinical trial for malaria vaccine, PATH Malaria Vaccine Initiative, \$6,033,760, 2009-14.
16. Meshnick, S. (P.I) and Emch, M. (P.I.) Genetic epidemiology of malaria in the Democratic Republic of the Congo. National Institute of Allergies and Infectious Disease, National Institutes of Health, 1R56AI097609, \$488,403 (direct), 2012-2013.
17. Popkin, B. (PI); Emch, M. (CoI), et al. China Health and Nutrition Survey: Monitoring Social Change, National Institutes of Health, 2R01HD030880-17, \$10,210,929, 2008-14.
18. Emch, M.E. (P.I.); Root, E.D.; Bearman, P.; Ali, M.; Clemens, J. Spatial and Social Network Analysis in Vaccine Trials. National Science Foundation, Award # BCS-0924479, \$300,183, 2009-13.
19. Hoffman, I. (P.I.); Emch, M. (CoI); Martinson, F. (CoI); Miller, W. (CoI); Demster, D. (CoI); Krysiak, R. (CoI); Mofolo, I. (CoI); Sungitsa, M. (CoI) MAL55 Phase III clinical trial for malaria vaccine, PATH Malaria Vaccine Initiative, \$287,898, 2008-11.
20. Fulbright Senior Scholar Award, New Zealand, 2011.
21. Emch, M.E. (P.I.) and Giebultowicz, S. (CoPI PhD student) Doctoral Dissertation Improvement Grant, National Science Foundation, The Spatial Ecology of Chronic Kidney Disease in Nicaragua, Award # 1130546, \$12,000, 2011-13.
22. W.N. Reynolds Research Leave, UNC College of Arts and Science, 2010-11.
23. Emch, M.E. (P.I.); Bearman, P.; Ali, M.; Clemens, J. Integration of Spatial and Social Network Analysis in Vaccine Trials. National Institute of Allergies and Infectious Disease, National Institutes of Health, Award #R03-AI076748, \$148,000, 2009-12.
24. Emch, M.E. (P.I.); Wan, H.; Moody, A. The Geography of Avian Influenza Evolution: Spatio-Temporal Relationships Between Virus Genes and Human-Environment Factors, National Science Foundation, Award # BCS-0717688, \$239,412, 2007-11.

25. Emch, M.E. (P.I.) REU Supplement: The Geography of Avian Influenza Evolution: Spatial and Temporal Relationships Between Virus Genes and Human-Environment Factors, National Science Foundation, Award # BCS-0919463, \$7500, 2009-11.
26. Meshnick, S. (PI); Emch, M.E. (CoPI); and Miller, M. (CoPI) Center for Accurate Data on Endemic and Emerging Infectious Diseases in Developing Countries, Gillings Innovation Labs, UNC School of Public Health, \$504,452, 2008-10.
27. Emch, M.E. (P.I.) and Root, E.D. (CoPI PhD Student) Doctoral Dissertation Improvement Grant, National Science Foundation, Socio-economic and Environmental Determinants of Gastroschisis in North Carolina, \$ 5,262, 2008-09.
28. VanGeen (P.I. Columbia University) Emch, M.E. (CoPI, subcontract P.I.-UNC); Band, L.; Serre, M. Does Arsenic Mitigation in Bangladesh Raise Exposure to Rotavirus and E. Coli? National Institute of Environmental Health Sciences, National Institutes of Health, 1R01TW008066-01/EID, \$1,496,946- total grant, \$349,888-UNC Portion, 2007-10.
29. Emch, M. (P.I.-UNC); Pascual, M. (P.I.- University of Michigan); Kinter, J. (CoP.I.-Center for Ocean-Land-Atmosphere Studies). Cholera and climate II: disentangling the interactions of pathogen, environment and host immunity, National Oceanic and Atmospheric Administration, \$117,689 (UNC portion of grant), 2008-2010.
30. Emch, M.E. (P.I.) Population-level Drivers of HIV drug resistance in Malawi. Center for AIDS Research Developmental Grant, UNC Medical School, \$20,000, 2008-10.
31. Emch, M. (P.I.-UNC); Pascual, M. (P.I.- University of Michigan); Dobson, A. (CoP.I.-Princeton University); Kinter, J. (CoP.I.-Center for Ocean-Land-Atmosphere Studies). Cholera Across Scales: Oceanic Links to Climate and Local Estuarine Influences, National Oceanic and Atmospheric Administration," \$217,970 (UNC portion of grant), 2004-2007.
32. Walsh, S.H.; Lu, F.; Rindfuss, R.R.; Emch, M.; Wolford, W.; Mena, C.F. Carolina Population Center Seed Grant. "A Preliminary Data Collection and Analysis of Population-Environment Interactions in the Galapagos Islands of Ecuador," \$27,500, 2007-08.
33. Emch, M.E. (P.I.) "Geographical Analysis in Vaccine Efficacy Trials, National Institute of Allergies and Infectious Disease," National Institutes of Health, 1R03AI53214-01, \$116,212, 2003-2005.
34. Emch, M.E. (P.I.). Global Health Faculty Research Partnership Grant, Office of Global Health, University of North Carolina at Chapel Hill, "Does Arsenic Mitigation in Bangladesh Raise Exposure to Bacterial and Viral Pathogens?," \$4,280, 2006-07.
35. Emch, M.E. (P.I.). Robert Wood Johnson Foundation Health & Society Seed Grant. "Columbia University Infectious Disease Working Group (IDWG)," \$12,000, 2005.
36. Emch, M.E. (P.I.); Works, M. (CoP.I.) "The Human Ecology of Land-Use Land-Cover Change in the Toledo District Belize: A Remote Sensing Approach," National Science Foundation, Division of International Programs, Grant # OISE 0349512, \$8034, 2004-2005.
37. Emch, M.E. (P.I.) "Geographical Analysis in Vaccine Efficacy Trials: Spatial Confounders, Effect Modifiers, and Herd Immunity Measurement," Geography and Regional Science Program, National Science Foundation, Grant # BCS 0323131, \$37,936, 2003-2005.
38. Emch, M.E. (P.I.) "Oregon Cancer Registry GIS Database Development Project," Oregon Health Services, Health Promotion and Chronic Disease Prevention, \$18,389, 2003-2004.
39. Emch, M.E. (P.I.) "Spatio-Temporal Patterns of Cholera in Vietnam," Faculty Enhancement Award, Office of Graduate Studies and Research, Portland State University, 2003-2005, \$7250 + 2 graduate assistant remission terms.

40. Emch, M.E. (P.I.) "Relationships Between Spatio-temporal Patterns of *Vibrio cholerae* and Environmental, Climatic, and Socio-demographic Variables," College of Liberal Arts and Sciences, Portland State University, Summer 2003 Faculty Fellowship, \$4000.
41. Emch, M.E. (P.I.) "Oregon Cancer Registry GIS Database Development Project," Oregon Health Services, Health Promotion and Chronic Disease Prevention, \$11,481, 2002-2003.
42. Emch, M.E.(P.I.) "Using Satellite Imagery to Monitor Relationships Between Land-Use Change and Water Quality in Iowa Lakes," NASA, Iowa Space Grant Consortium, Seed Grant, \$10,000, 2001.
43. Czarnetski, A (P.I.); Emch, M.E. (CoP.I.); and Cooney, T.(CoP.I.) "Science Center for Teaching, Outreach, and Research on Meteorology (STORM)," National Oceanic and Atmospheric Administration, \$1,500,000, 2000-2003. Director of the Center's Remote Sensing Initiative.
44. Emch, M.E. "Web-based Satellite Image Processing Course Material Development," Provost's Mini-Grant, University of Northern Iowa, \$1200, Summer 2001.
45. Emch, M.E. "Environmental Risk Factors for Groundwater Arsenic Contamination and Arsenicosis in Matlab, Bangladesh: A Pilot Study," Association of American Geographers Research Grant \$1000, 2000.
46. Emch, M.E. "Environmental Risk Factors for Groundwater Arsenic Contamination and Arsenicosis in Matlab, Bangladesh: A Pilot Study," Global Health Corps, \$1500, Summer 2000.
47. Emch, M.E. "Environmental Risk Factors for Groundwater Arsenic Contamination and Arsenicosis in Matlab, Bangladesh: A Pilot Study," University of Northern Iowa Summer Research Grant, \$5500, Summer 2000.
48. Salim, M. (P.I.); Emch, M.E. (CoP.I.); Strauss, T. (CoP.I.); and Timmerman, M. (CoP.I.) "Artificial-Intelligence-Based Optimization of the Management of Snow Removal Assets and Resources," Midwest Transportation Consortium, United States Department of Transportation. \$130,745, 2000-2002.
49. Emch, M.E. "Distance Education in Geographic Information Science," Dean's Challenge Grant, University of Northern Iowa College of Social and Behavioral Sciences, \$1868, Summer 1999.
50. Emch, M.E. Fellowship, Fulbright Program, Group Projects Abroad, Nigeria, Summer 1999.
51. Emch, M.E. American Institute of Bangladesh Studies Dissertation Fellowship, \$25,000, 1995-1996.
52. Emch, M.E. Association of American Geographers Dissertation Fellowship, 1995-1996.
53. Emch, M.E. Foreign Language and Area Studies Dissertation Fellowship, 1995-1996.
54. Emch, M.E. Foreign Language and Area Studies Fellowship, Summer 1995 (For intensive Bengali language training at the University of Washington).
55. Emch, M.E. Graduate Office Fellowship, Michigan State University, Summer 1995.
56. Emch, M.E. International Travel Grant, Institute of International Health, Michigan State University, 1994.
57. Emch, M.E. Fulbright Scholarship, Bangladesh, 1993.

## **PROFESSIONAL SERVICE**

### Editorial Boards and Peer Review

- **Advisory Editor**, Medical Geography, Social Science & Medicine (2005 to Present).
- **Associate Editor**, Health & Place (2015 to Present).

- **Editorial Board**, SSM - Population Health, (2015 to Present).
- **Editorial Board**, Health & Place, (2014 to 2015).
- **Paper Reviewer** Proceedings of the National Academies of Sciences; Social Science & Medicine; Health & Place; PLoS One; Malaria Journal; Epidemiology; EcoHealth; The Lancet; PLoS Neglected Tropical Diseases; Epidemiology and Infection; American Journal of Tropical Medicine and Hygiene; Annals of the Association of American Geographers; Vaccine; International Journal of Health Geographics; American Journal of Epidemiology; Expert Review of Vaccines; Journal of Health, Population, and Nutrition; Acta Psychiatrica Scandinavica; Cartography and GIS; Southeastern Geographer; Geophysical Research Letters; African Studies Quarterly; Water Research; Antipode; Geographical Review; Applied Geography; Photogrammetric Engineering and Remote Sensing; Journal of Environmental Science and Health; Journal of the Royal Society Interface; Professional Geographer; Environment and Planning A; Computers, Environment, and Urban Systems; Climate Research; Himalayan Research Bulletin; Coastal Management Journal; International Journal of Global Environmental Issues.
- **Grant Proposal Reviewer** National Institutes of Health; Belgian Earth Observation Programme, Belgian Science Policy Office; Secretariat of the Research Grants Council of Hong Kong (2009, 2010, 2011); North Carolina TraCS Institute; National Science Foundation, Geography and Regional Science/Spatial Science; National Science Foundation, Partnerships for International Research and Education UNC Internal Competition; National Science Foundation, Division of International Programs (2001, 2005); National Science Foundation, Human and Social Dynamics; Louisiana Board of Regents Support Fund Research and Development Program; NASA Experimental Program to Stimulate Competitive Research (EPSCoR); National Geographic Society.
- **Reviewer**, United States President's Emergency Plan for AIDS Relief (PEPFAR) eLearning Course Reviewer (2014).
- **Reviewer**, Jacques May Dissertation Award, Health and Medical Geography Specialty Group. Association of American Geographers (2011).
- **NIH Study Section Study Section Member**, Special Emphasis Panel/Scientific Review Group 2016/05 ZRG1 PSE-C (04) M meeting (2016).
- **NSF Panel Member** (2016).
- **NIH Study Section ad hoc Reviewer**, Social Sciences and Population Studies A Study Section, National Institutes of Health (2012).
- **NIH Study Section Member**, Social Networks and Health Study Section, National Institutes of Health (2010).



- **NIH Study Section Member** (ad hoc and Special Emphasis Panels), Infectious Diseases, Reproductive Health, Asthma, and Pulmonary Epidemiology (IRAP) Study Section, National Institutes of Health (7/06, 4/07, 10/07).
- **Review Panel Member**, Human and Social Dynamics FY 2006 competition, National Science Foundation (5/06).
- **NRC Report Reviewer**, Contributions of Land Remote Sensing for Decisions about Human Welfare: Workshop Report, National Research Council's Board on Earth Sciences and Resources, The National Academy of Sciences, 2006.
- **Book Reviewer**, John Wiley & Sons, Inc., Geography and Geology Division (2002, 2003).
- **External Tenure and Promotion Review**, (since 2009), Tenure and Promotion to Associate Professor Review (13 cases); Promotion to Professor (3 cases); Third Year Review (1 case). Names and universities not listed for confidentiality.

#### Conference Organization and Review

- **Scientific Review Committee**, International Medical Geography Symposium, East Lansing, MI, 7/7-13/13.
- **Symposium Organizing Committee Member**, Geography, GIScience, and Health: Spatial Frontiers of Health Research and Practice, Association of American Geographers, Los Angeles, 4/9-13/13.
- **Review Committee Member**, 2012 Water and Health Conference, University of North Carolina at Chapel Hill, 10/29-11/2/12.
- **Review Committee Member**, 2011 Water and Health Conference, University of North Carolina at Chapel Hill, 10/3-7/11.

#### Board Membership

- **Affiliate Representative**, Section Committee on Geology and Geography, American Association for the Advancement of Science. (2011-2014)
- **Member**, International Water Association Task Force on Water Quality and Health (2010).
- **Member**, Committee on Spatial Data Enabling USGS Strategic Science in the 21<sup>st</sup> Century, National Research Council of the National Academies (2009/10).
- **Member**, United States Centers for Disease Control Geospatial Science and Healthy Communities Expert Panel (5/08).
- **Board Member**, American Society of Photogrammetry and Remote Sensing, Columbia River Region Chapter (9/03 to 9/04).
- **Member**, Scholarship Committee, Urban and Regional Information Systems Association, Oregon and Southwest Washington Chapter (2/02 to 9/04).
- **Board Member**, Iowa Geographic Information Council (8/98 to 12/01).

#### Invited Research and Advisory Panels.

- Emch, M.E. Chief Guest and Panel Member, Emerging Global health issues in the developing countries: prospects and challenges for Bangladesh, North South University, Dhaka, Bangladesh, 7/19/17.
- Emch, M.E. Invited Panel Discussant: Space and place in population, health, and environment research, *Association of American Geographers*, San Francisco, 3/30/16.
- Emch, M.E. Invited Panel Member, Park Scholar Program Learning Lab II: The Role of United States in Addressing Disease Outbreaks, North Carolina State University, 9/16/15.
- Emch, M.E. Invited Panel Member, Health and Environment V: A Panel Discussion on Future Directions, *Association of American Geographers*, Chicago, 4/24/15.
- Emch, M.E. Invited Panel Member, Experts Meeting on Geospatial Approaches to Monitoring and Evaluation, John Snow Inc., Arlington, VA, 12/05/13.
- Emch, M.E. Invited Panel Member, Measure DHS GIS Consultative Meeting, ICF International, Washington, D.C., 6/10-12/13.
- Emch, M.E. Invited Speaker to U.S. Senate, World Malaria Day, 4/25/12.
- Emch, M.E. Invited Panel Member, “Malaria in South Asia: Calling Attention to the Forgotten,” *Association of American Geographers*, Washington, D.C., 4/15/10.
- Emch, M.E. Invited Panel Member. “Dynamics of Space-Time Use: Measurement, Patterns and Consequences,” Criminal Justice Research Center, The Ohio State University, 10/02/09.
- Emch, M.E. Invited Session Chair and Discussant. “Disparities in Health and Place Relationships,” *Population Association of America Annual Meetings*, Detroit, 4/30/09.
- Emch, M.E. Invited Commentator. “Poverty, Inequality, & the State,” North Carolina Center for South Asian Studies, Chapel Hill, 1/13/08.
- Emch, M.E. Invited Commentator. “Health and Society Research Panel,” *Robert Wood Johnson Foundation Health and Society Annual Meetings*, Chicago, 5/2/07.
- Emch, M.E. Organizer and Chair, Paper Session, “Remote Sensing, Environment, and Human Health,” *Association of American Geographers*, San Francisco, 4/17/07.
- Emch, M.E. Invited Discussant. “Spatial Determinants of Health,” *Population Association of America Annual Meetings*, New York, 3/31/07.
- Emch, M.E. Invited Panel Member. “The Committee on Earth System Science for Decisions about Human Welfare: Contributions of Remote Sensing Workshop,” Division of Earth and Life Sciences, National Academies of Science, Washington, DC, 1/30/06.
- Emch, M.E. Chair, Panel Discussion, “Health and Education,” *Annual Symposium on Development and Globalization*, The Program in International Development and Globalization, Columbia University, New York, 11/11/05.
- Emch, M.E. Organizer and Chair, Paper Session and Panel Discussion, “Overcoming the individualistic fallacy: Ecological variables, neighborhood determinants, and multilevel modeling in health and disease research,” *11th International Medical Geography Symposium*, Fort Worth, 7/6/05.
- Emch, M.E. Organizer and Chair, Paper Session and Panel Discussion, “Spatial Analysis in Infectious Disease Research,” *Association of American Geographers*, Denver, 4/5/05.
- Emch, M.E. Invited Panel Member. “*Ecological Modeling for NASA Applied Sciences, Sponsors: The Center for Health Applications of Aerospace Related Technologies*,” NASA-Ames Research Center and the Applied Sciences Program, NASA HQ, Monterey, CA, 3/30/05.

- Emch, M.E. Invited Speaker & Panel Member. “Water Quality Issues and Sustainable Development,” *Cross-cutting Initiatives Seminar Series*, The Earth Institute, Columbia University, 12/9/04.
- Emch, M.E. Panel Member, “University GIS Certificate Programs in Oregon,” *GIS in Action*, Portland, Oregon. 5/13/04.
- Emch, M.E. Panel Member, “How the Education System is Preparing Students for Careers in GIS and Remote Sensing,” *GIS in Action*, Portland, Oregon. 4/3/02.
- Emch, M.E. Panel Member, “Environment, Population, and Hazards in South Asia,” *Association of American Geographers*, New York, 3/1/01.

#### Workshops and Short Courses

- Emch, M.E. Short Course, “GIS in Public Health,” School of Public Health, University of the Witwatersrand, Johannesburg, South Africa, funded by NIH Fogarty International 8/15/16-8/19/16.
- Emch, M.E. and Janko, M. Invited Short Course, “GIS in Public Health,” Kinshasa School of Public Health, 6/2/14-6/6/14.
- Emch, M.E. Invited Short Course, “GIS in Public Health,” Malawi College of Medicine MPH Program, funded by NIH Fogarty International, 6/1/09-6/5/09.
- Emch, M.E. Workshop, “Spatial Analysis in Health Research,” part of Demographic Surveillance and GIS Workshop, *10th Asian Conference on Diarrhoeal Diseases and Nutrition*, Dhaka, Bangladesh, 12/06/03.
- Emch, M.E. Workshop, “Satellite Image Processing,” *Association of Pacific Coast Geographers Annual Meeting*, 9/17/03.
- Emch, M.E. Workshop, “Introduction to Geographic Information Systems,” *Information Technologies in Education: Problems and Prospects*, St. Petersburg, Russia, 5/11/00-5/13/00.

#### Service to University of North Carolina at Chapel Hill

- **Chair**, Department of Geography (2013-2018).
- **Member**, UNC Center for AIDS Research (CFAR) Advisory Board (2017-present).
- **Member**, Administrative Board, University of North Carolina Summer School, (2016-19).
- **Member**, Advisory Board, Center for Faculty Excellence, University of North Carolina, (2016-19).
- **Member**, Faculty Advisory Committee, Institute for the Environment (2012 to present).
- **Member**, Search Committee, Director, Carolina Population Center (2016-17).
- **Member**, Review Committee, Explorations in Global Health Grants, Center for Infectious Disease, School of Medicine (2016).
- **Member**, Review Committee, Center for Faculty Excellence (2015)
- **Chair**, Review Committee, Center for Urban and Regional Studies and Director of the Center (2015)
- **Chair**, Faculty Search Committee, Department of Geography (2012)
- **Member**, Faculty Search Committee, Department of Global Studies (2011/12)
- **Member**, Department of Geography Promotion and Tenure Committee (8/11 to 7/14)
- **Member**, Department of Geography Graduate Education Committee (1/07 to 5/07 and 8/11- 7/13)
- **Member**, Carolina Population Center Training Committee (8/06 to 12/10 & 2/12- 2/16)
- **Member**, UNC Institute for Global Health & Infectious Diseases Planning Committee (9/07-7/13)
- **Director of Undergraduate Studies**, Department of Geography (7/07 to 8/10)

- **Member**, Faculty Search Committee, “Bowles Professorship,” Department of Geography (2010)
- **Member**, Gillings Innovative Labs Review Committee, School of Public Health (2010)
- **Member**, NSF PIRE Internal Review Committee (1/09)
- **Faculty Advisor**, “UNC Geographical Society” (3/08 to 8/10)
- **Member**, Faculty Search Committee, “Contemporary South Asia,” Department of Geography (2008/09)
- **Member**, UNC Global Health Research Grant Selection Committee (2007/08)
- **Chair**, Faculty Search Committee, “Contemporary South Asia,” Department of Geography (2007/08)
- **Faculty Advisor**, Department of Geography Colloquium Committee (8/06 to 5/07)
- **Member**, Department of Geography Undergraduate Education Committee (8/06 to 12/06)

#### **MEMBERSHIPS IN PROFESSIONAL SOCIETIES**

- Association of American Geographers
- Interdisciplinary Association of Population Health Science
- Population Association of America
- American Association for the Advancement of Science
- American Society of Tropical Medicine and Hygiene