

CURRICULUM VITAE

Michael Edward Emch

Spatial Health Research Group Website: www.cpc.unc.edu/projects/spatialhealthgroup

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

- Professor and Chair, Department of Geography, University of North Carolina at Chapel Hill.
- Professor, Department of Epidemiology, University of North Carolina at Chapel Hill.
- Fellow, Carolina Population Center, University of North Carolina at Chapel Hill.

Past Employment

- Professor, Department of Geography, University of North Carolina at Chapel Hill (2010-2013).
- 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

- 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 21st 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.

BOOKS AND CHAPTERS

Books

1. 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.

2. Meade, M. and Emch, M. (2010) *Medical Geography*. 3rd Edition. The Guilford Press: New York. 498 pages.

Book Chapters

3. Emch, M. and Giebultowicz, S. (2015) Epidemiological Map, In (Ed.) Monmonier, M. *Volume Six: Cartography in the Twentieth Century*, University of Chicago Press.
4. Winston, J. and Emch, M (2013) *Medical Geography*, in (Ed.) Warf, B. *Oxford Bibliographies in Geography*, Oxford University Press. www.oxfordbibliographies.com
5. 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.
6. 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.
7. 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.
8. 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.
9. Emch, M.E. and Escamilla, V. (2010) Cholera. In (Ed.) Warf, B. *Encyclopedia of Geography*, Thousand Oaks, CA: SAGE Publications.
10. 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.
11. 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.
12. 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.
13. 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

14. Han L; Bien C; Wei C; Muessig KE; Yang M; Liu F; Yang L; Meng R; Emch M; Tucker JD. (2014, in press) HIV Self-Testing Among Online MSM in China: Implications for Expanding HIV Testing Among Key Populations. *Journal of AIDS*.
15. Escamilla, V; Emch, M; Dandolo, L; Miller, WC; Martinson, F; Hoffman, I. (2014, in press) 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*.
16. Antonia AL; Taylor SM; Janko M; Emch M; Tshetu AK; Meshnick SR. (2014, in press) A Cross-sectional Survey of Plasmodium falciparum pfcrt Mutant Haplotypes in the Democratic Republic of Congo. *American Journal of Tropical Medicine and Hygiene*.

17. Patel JC; Taylor SM; Juliao JJ; Parobek CM; Janko M; Gonzalez LD; Tshetu AK; Emch M; Udhayakumar V; Lindblade K; Meshnick SR (2014, in press) Genetic evidence for the importation of falciparum malaria by Guatemalan soldiers returning from the Democratic Republic of the Congo. *Emerging Infectious Diseases*.
18. Perez-Heydrich C; Hudgens MH; Halloran ME; Clemens J; Ali M; Emch, M. (2014, in press). Assessing the effects of cholera vaccination in the presence of interference. *Biometrics*.
19. Wu, J; Yunus, M; Streatfield, PK; Emch, M. (2013, in press) Association of climate variability and childhood diarrhoeal disease in rural Bangladesh, 2000-2006. *Epidemiology and Infection*. DOI: <http://dx.doi.org/10.1017/S095026881300277X>.
20. 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.
21. 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.
22. Messina, JP; Mwandagalirwa, 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.
23. 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.
24. 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.
25. 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*. 3: 1990.
26. Carrel, M. and Emch, M. (2013) Genetics: A New Landscape for Medical Geography. *Annals of the Association of American Geographers*. 103(6): 1452-1467.
27. 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.
28. 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.
29. 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.
30. 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.

31. 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.
32. 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
33. 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.
34. 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.
35. 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.
36. 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.
37. Carrel, M; Wan, X-F; Nguyen, T; Emch, M (2012) H5N1 Avian Influenza Viruses Exhibit Few Barriers to Gene Flow in Vietnam. *EcoHealth*. 9(1): 60-69.
38. 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.
39. 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.
40. 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.
41. 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.
42. 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
43. 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.
44. 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.

45. Mason, S.M.; Kaufman, J.S.; Daniels, J.L.; Emch M.E.; Hogan, V.K.; and Savitz, D.A. (2011) Black Preterm Birth Risk in Non-Black Neighborhoods: Effects of Hispanic, Asian, and Non-Hispanic White Ethnic Densities. *Annals of Epidemiology*. 21(8): 631-638.
46. Taylor, SM; van Eijk, A; Hand, CC; Mwandagalirwa, MK; Messina, J; Tshefu, A; Atua, B; Emch, M; Muwonga, J; Meshnick, SR; ter Kuile, F. (2011) Quantification of the Burden and Consequences of Pregnancy-associated Malaria in the Democratic Republic of the Congo. *Journal of Infectious Diseases*. 204(11): 1762-71.
47. Tan, N; Messina, J; Yang, L-G; Yang, B; Emch, M; Chen, X-S; Cohen, M; Tucker, JD (2011) A Spatial Analysis of County-level Variation in Syphilis and Gonorrhea in Guangdong Province, China. *PLoS One* 6(5): e19648.
48. Ali, M; Emch, M; Park, JK; Yunus, M; Clemens, J. (2011) Natural Cholera Infection-derived Immunity in an Endemic Setting. *Journal of Infectious Diseases*. 204: 912-918.
49. Root, ED; Giebultowicz, S; Ali, M; Yunus, M; and Emch, M. (2011) The Role of Vaccine Coverage Among Social Networks in Cholera Vaccine Efficacy. *PLoS One*. 6(7): e22971.
50. Mumba, D; Bohorquez, E; Messina, J; Kande, V; Taylor, SM; Tshefu, A; Muwonga, J; Mwandagalirwa, MK; Emch, M; Tidwell, R; Büscher, P; Meshnick, SR. (2011) Prevalence of Human African Trypanosomiasis in the Democratic Republic of the Congo. *PLoS Neglected Tropical Diseases*. 5(8): e1246.
51. Messina, JP; Taylor, SM; Meshnick, SR; Linke, A; Tshefu, AK; Atua, B; Mwandagalirwa, K; Emch, M (2011) Population, Behavioral and Environmental Drivers of Malaria Prevalence in the Democratic Republic of Congo. *Malaria Journal*. 10:161.
52. Carrel, M; Escamilla, V; Messina, J; Giebultowicz, S; Winston, J; Yunus, M; Streatfield, PK, Emch, M. (2011) Increased Tubewell Density Decreased Diarrheal Disease Risk in Rural Matlab, Bangladesh: A Zero-inflated and Geographically Weighted Analysis. *International Journal of Health Geographics*. 10:41.
53. Reyburn, R.; Kim, DR.; Emch, M.; Khatib, A.; von Seidlein, L.; Ali, M. (2011) Climate Variability and Outbreaks of Cholera in Zanzibar, East Africa: A Time Series Analysis. *American Journal of Tropical Medicine & Hygiene*. 84(6): 862–869.
54. Knappett, PSK; Escamilla, V; Layton, A; McKay, LD; Emch, M.; Williams, D; Huq, MR; Alam, MJ; Farhana, L; Mailloux, MJ; Ferguson, A; Saylor, GS; Ahmed, KM; van Geen, A. (2011) Impact of Sanitation on Fecal Bacteria and Pathogens in Ponds of Bangladesh. *Science of the Total Environment*. 409(17): 3174-3182.
55. Escamilla, V.; Wagner, B; Yunus, M.; Streatfield, P.K.; van Geen, A.; Emch, M (2011) Impact of Deep Tubewells on Childhood Diarrhea in Bangladesh. *Bulletin of the World Health Organization*. 89: 521–527.
56. Kalkbrenner, A.; Daniels, J.; Emch, M.; Morrissey, J.; Poole, C.; Chen, J-C. (2011) Geographic Access to Health Services and Autism Diagnosis. *Annals of Epidemiology*. 21: 304–310.
57. Taylor, S.M.; Messina, J.P.; Hand, C.C.; Juliano, J.J.; Muwonga, J.; Tshefu, A.K.; Atua, B.; Emch, M.; Meshnick, S.R. (2011) Molecular Malaria Epidemiology: Mapping and Burden Estimates for the Democratic Republic of the Congo, 2007. *PLoS One*. 6(1): 1-9.
58. Mason, S.M.; Kaufman, J.S.; Daniels, J.L.; Emch M.E.; Hogan, V.K.; and Savitz, D.A. (2011) Neighborhood Ethnic Density and Preterm Birth Across Seven Ethnic Groups in New York City. *Health & Place* 17(1): 280-288.
59. van Geen, A; Ahmed, KM; Akita, Y; Alam, MJ; Culligan, PJ; Feighery, J; Ferguson, AS; Emch, M; Escamilla, V; Knappett, P; Layton, AC; Mailloux, BJ; McKay, LD; Mey, JL; Serre, M;

- Streatfield, PK; Wu, J; Yunus, M. (2011) Fecal Contamination of Shallow Tubewells in Bangladesh Inversely Related to Arsenic. *Environmental Science & Technology*. 45 (4): 1199-1205.
60. Root, E.D.; Meyer, R.; and Emch, M. (2011) Socioeconomic Context and Gastrochisis: Exploring Associations at Various Geographic Scales. *Social Science & Medicine*. 72(4): 625-633.
 61. 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.
 62. Messina, J.; Emch, M.; Muwonga, J.; Mwandagalirwa, K; Edidi, SB; Mama, N.; Okenge, A.; Meshnick, S. (2010) Spatial and Socio-demographic Patterns of HIV Prevalence in the Democratic Republic of Congo. *Social Science & Medicine*. 71(8): 1428-35.
 63. Mason, S.M.; Kaufman, J.S.; Daniels, J.L.; Emch M.E.; Hogan, V.K.; and Savitz, D.A. (2010) Ethnic Density and Preterm Birth in African-, Caribbean-, and US-Born Non-Hispanic Black Populations in New York City. *American Journal of Epidemiology*. 172(7): 800-808.
 64. Feldacker, C.; Ennett, S.; and Emch, M. (2010) The Who and Where of HIV in Rural Malawi: Exploring the Effects of Person and Place on Individual HIV Status. *Health & Place*. 16: 996–1006.
 65. Huq, A.; Yunus, M.; Sohel, M. Bhuiya, A.; Emch, M.; Luby, S.P.; Russek-Cohen, E.; Nair, G.B.; Sack, R.B.; Colwell, R.R. (2010) Simple Sari Filtration is Sustainable and Continues to Protect Villagers from Cholera in Matlab, Bangladesh. *mBio*. 1(1):e00034-10.
 66. Root, E.D. and Emch, M. (2010) Tracing Drinking Water to its Source: An Ecological Study of the Relationship between Textile Mills and Gastrochisis in North Carolina. *Health & Place*. 71(8): 794-802.
 67. Kalkbrenner, A.; Daniels, J.; Chen, J-C.; Poole, C.; Emch, M.; Morrissey, J. (2010) Perinatal Exposure to Hazardous Air Pollutants and Autism at Age 8 in North Carolina and West Virginia. *Epidemiology*. 21(5): 1-11.
 68. Ruiz-Moreno, D.; Pascual, M.; Emch, M. Yunus, M. (2010) Spatial Clustering in the Spatio-temporal Dynamics of Endemic Cholera. *BMC Infectious Diseases*. 10:51.
 69. Savory, DJ.; Cox, KL.; Emch, M.; Alemi, F.; Pattie, DC. (2010) Enhancing Spatial Detection Accuracy for Syndromic Surveillance with Street Level Incidence Data. *International Journal of Health Geographics*. 9:1.
 70. Carrel, M.; Voss, P.; Streatfield, K.; Yunus, M.; Emch, M. (2010) Protection From Annual Flooding Is Correlated with Increased Cholera Prevalence in Bangladesh. *Environmental Health*. 9:13.
 71. DiMaggio, C.; Galeo, S.; and Emch, M. (2010) Spatial Proximity and the Risk of Psychopathology after a Terrorist Attack. *Psychiatry Research*. 176: 55-61.
 72. Carrel, M.; Emch, M.; Jobe, R.T., Moody, A.; Wan, X-F. (2010) Spatiotemporal Structure of Molecular Evolution of H5N1 Highly Pathogenic Avian Influenza Viruses in Vietnam. *PLoS One*. (5)1: 1-9.
 73. Emch, M.; Yunus, M.; Escamilla, V.; Feldacker, C.; Ali, M. (2010) Local Population and Regional Environmental Drivers of Cholera in Bangladesh. *Environmental Health*. 9: 2.
 74. Porter, K.; Thomas, J.; Emch, M. (2010) Variations in the effect of incarceration on community gonorrhoea rates, Guilford County, North Carolina, 2005–2006. *International Journal of STD and AIDS*. 21: 34-38.
 75. Carrel, M.; Emch, M.; Streatfield, K.; Yunus, M. (2009) Spatio-temporal Clustering of Cholera: The Impact of Flood Control in Matlab, Bangladesh, 1983-2003. *Health & Place*. 15(3): 771-782.

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77. Root, E.D.; Meyer, R.; Emch, M. (2009) Evidence of Localized Clustering of Gastroschisis Births in North Carolina, 1999-2004. *Social Science & Medicine*. 68: 1361-1367.
78. Emch, M.; Ali, M.; Root, E.D.; Yunus, M. (2009) Spatial and Environmental Connectivity Analysis in Vaccine Trials. *Social Science & Medicine*. 68: 631-637.
79. Wan, X-F., Nguyen, T., Smith, C., Zhao, Z., Carrel, M., Davis, C., Balish, A., Luo, F., Emch, M., Klimov, A. & Donis, R. (2008). Evolution of Highly Pathogenic H5N1 Avian Influenza Viruses in Vietnam Between 2001 and 2007. *PLoS One*. 3(10): 1-12.
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82. Emch, M.; Ali, M.; Yunus, M. (2008) Risk Areas and Neighborhood-level Risk Factors for *Shigella dysenteriae* 1 and *Shigella flexneri*: Implications for Vaccine Development. *Health & Place*. 14: 96-105.
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85. Emch, M; Ali, M.; Yunus, M.; Sack, D.; Acosta, C.; and Clemens, J.D. (2007) Efficacy Calculation in Randomized Vaccine trials: Global or Local Measures? *Health & Place*. 13: 238-248.
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89. Emch, M. and Peterson, M. (2006) Mangrove Forest Cover Change in the Bangladesh Sundarbans from 1989-2000: A Remote Sensing Approach. *Geocarto International* 21(1): 5-12.
90. Ali, M.; Park, J.K.; Thiem, D.; von Seidlein, L.; Canh, D.; Emch, M.E.; and Clemens J.D. (2005) Neighborhood Size and Local Geographic Variation of Health Events: Using Hartley's Test of Homogeneity to Select Optimal Neighborhood Size. *International Journal of Health Geographics*, 4:12.
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99. Salim, M.D.; Strauss, T., and Emch, M. (2002) A GIS-Integrated Intelligent System for Optimization of Asset Management for Maintenance of Roads and Bridges, In (Eds.) Hendtlass, T. and Ali, M. *Developments in Applied Artificial Intelligence*, pp. 628-637.
100. Emch, M.E. and Ali, M. (2001) Spatial and Temporal Patterns of Diarrheal Disease in Matlab, Bangladesh, *Environment and Planning A*, 33(2): 339-350.
101. Ali, M.; Emch, M.; Ashley, C.; and Streatfield, P.K. (2001) Implementation of a Medical Geographic Information System: Concepts and Uses, *Journal of Health, Population, and Nutrition*, 19(2): 100-110.
102. Ali, M.; Emch, M.E.; Tofail, M.; and Baqui, A.H. (2001) Implications of Health Care Provision on Acute Lower Respiratory Infection Mortality in Bangladeshi Children, *Social Science & Medicine*, 52(2): 267-277.
103. Emch, M.E. (2000) Relationships Between Flood Control, Kala-azar, and Diarrheal Disease in Bangladesh, *Environment and Planning A*, 32, 1051-1063.
104. Emch, M.E. (1999) Diarrheal Disease Risk in Matlab, Bangladesh, *Social Science & Medicine*, 49, 519-530.

In Review

105. Winston JJ; Meyer RE; Emch ME (R&R) A geographic analysis of compositional and contextual risk factors for hypospadias births. *Birth Defects Research Part A: Clinical and Molecular Teratology*.
106. Tan NX, Tan GX, Yan L, Yang B, Powers KA, Emch ME, Tucker JD (R&R) Temporal Trends in Syphilis and Gonorrhea Infections in Guangdong Province, China. *Journal of Infectious Diseases*.
107. Perez-Heydrich, C; Verdery, A; Ali, M; Clemens, J; and Emch, M. (submitted) Integrating the Effects of Space, Environment, and Social Networks in Vaccine Trials. *Journal of Epidemiology and Community Health*.
108. Carrel M; Patel JC; Taylor S; Janko, M; Kashamuka M; Tshetu A; Escalante A; McCollum A; Alam MT; Udhayakumar V; Meshnick S; Emch M (submitted) The geography of malaria genetics in the Democratic Republic of Congo: a complex and fragmented landscape.

109. Smith, GS; Van DenEeden, SK; Garcia, C; Shan, J; Baxter, R; Herring, AH; Richardson, DB; Emch, M; VanRie, A; Gammon, MD. (submitted) Air Pollution and the Risk of Pulmonary Tuberculosis in Northern California.
110. Hoots BE; Escamilla V; Emch ME; MacDonald P; Hightow- Weidman L; Leone PA; Miller WC. (submitted) The Effect of Internet Use to Meet Sexual Partners on the Existence of Geographic Core Areas of HIV Transmission in North Carolina (2000-2007).
111. Messina, J. and Emch, M. (submitted) Spatial Epidemiology of Infectious Disease Prevalence Using Surveillance Data.
112. Cash BA; Rodó X; Emch M; Yunus M; Faruque ASG; Pascual M. (submitted) Cholera and Shigellosis: Different Epidemiology but Similar Responses to Climate Variability.
113. Bien C; Cai Y; Emch M; Parish W; Tucker JD (submitted) High Adult Sex Ratios and Sexual Risk Behaviors: A Systematic Review.
114. Wu J; Yunus M; Streatfield PK; Emch E. (submitted.) Association of climate factors and childhood diarrheal disease in rural Bangladesh, 2000-2006.
115. Escamilla V; Perez-Heydrich C; Yunus M; Streatfield PK; Emch M; (submitted) Influences of poor sanitation on childhood diarrhea in rural Bangladesh.
116. Smith, G; Van Den Eeden; SK; Baxter, R; Shan, J; Van Rie, A; Herring, AH; Richardson, D; Emch, M; Gammon, MD. (submitted) Cigarette smoking and pulmonary tuberculosis in northern California.
117. Rosenberg M; Pettifor A; Miller WC; Thirumurthy H; Emch M; Sulaimon A; Kahn K; Collinson M; Tollman S (submitted) Relationship between school dropout and teen pregnancy among rural South African young women.
118. 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 (submitted) Alcohol outlets, sexual risk behavior, and HSV-2 infection among South African female adolescents.

Proceedings

119. Emch ME (1998) Spatial and Environmental Risk Factors for Diarrheal Disease in Matlab, Bangladesh, *Proceedings of the Geographic Information Systems in Public Health Conference*, San Diego.
120. Emch ME (1995) Spatial Patterns of Diarrheal Disease in Matlab, Bangladesh, *Proceedings of the International Symposium on Computer Mapping in Epidemiology and Environmental Health*, Tampa, pp. 148-153.

Technical Reports

1. 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.; 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, 4/13.
2. 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.
3. 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, 4/9-13/13.
4. 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.
5. 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.
6. 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.
7. Emch, M. “Spatial Analysis in Infectious Disease Research.” *1st Annual UNC-China Sexually Transmitted Diseases Training Conference*, Guangzhou, China, 5/28/12.
8. Emch, M. “Spatial Analysis in HIV Research in the Democratic Republic of Congo and North Carolina.” *6th Annual China Sexually Transmitted Disease Conference*, Shenzhen, China, 5/25/12.
9. 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.
10. 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.
11. Giebultowicz, S. and Emch, M. “The Spatial Epidemiology of Chronic Kidney Disease in Nicaragua” *Association of American Geographers*, New York, 2/24/12.
12. 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.
13. Messina, J; Mwandagirwa, 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.
14. 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.
15. 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.
16. Root, ED and Emch, M. “Regional Environmental Patterns of Diarrheal Disease in Bangladesh” *Association of American Geographers*, Seattle, 4/12/11.

17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. Taylor, SM; Messina, J; Hand, CC; Mwandagalirwa, K; Tshetu, 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.
24. Messina, J; Emch, M; Taylor, SM; Mwandagalirwa, K; Muwonga, J; Matindii, A; Tshetu, AK; Meshnick, SR. Population, behavioral and environmental drivers of malaria parasitemia in the Democratic Republic of Congo. *American Society of Tropical Medicine and Hygiene*, Atlanta, 11/06/10.
25. 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.
26. 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.
27. 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.
28. Messina, J.; Emch, M.; and Feldacker, C. "Seasonality of global cholera patterns, 1930 to 2005." *International Medical Geography Symposium*, Hamilton, Ontario, 7/17/09.
29. 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.

30. 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.
31. 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.
32. 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.
33. 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.
34. 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.
35. 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.
36. 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.
37. 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.
38. Messina, J.; Emch, M.; Feldacker, C. "Seasonality of Global Cholera Patterns, 1930 to 2005." *Association of American Geographers*, Las Vegas, NV, 3/26/09.
39. 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.
40. 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.
41. 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.
42. 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
43. 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.
44. 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.
45. 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.

46. 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.
47. Emch, M.E. and Root, E.D. "Spatial, Environmental, and Social Network Analysis in Vaccine Trials," *Association of American Geographers*, Boston, 4/18/08.
48. 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.
49. 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.
50. 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.
51. 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.
52. 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.
53. 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.
54. 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.
55. 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.
56. Emch, M.E. "Spatial, Environmental, and Social Network Analysis in Vaccine Trials" *12th International Medical Geography Symposium*, Bonn, Germany, 7/13/07.
57. 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.
58. Emch, M.E. and Feldacker, C. "Developing a cholera early warning system using environmental information," *Association of American Geographers*, San Francisco, 4/19/07.
59. 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.
60. Emch, M.E. and Ali, M. "Ecological Correlates of Spatial Heterogeneous Vaccine Efficacy," *11th International Medical Geography Symposium*, Fort Worth, 7/6/05.
61. 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.

62. Emch, M.E.; Ali, M.; and Clemens, J. "Using Spatial Information to Improve Vaccine Trials," *Association of American Geographers*, Denver, 4/5/05.
63. 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.
64. 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.
65. 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.
66. 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.
67. 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.
68. 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.
69. 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.
70. Emch, M.E. "Geographical Analysis for Vaccine Trials," *Association of American Geographers*, Los Angeles, 3/21/02.
71. 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.
72. 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.
73. 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.
74. Johnson, R. and Emch, M.E. "STORM Remote Sensing Project Satellite Image Distribution," *5th Biennial Iowa GIS Conference*, University of Iowa, 10/04/01.
75. Suckling, K. and Emch, M.E. "Factors Affecting Groundwater Arsenic Contamination in Bangladesh," *5th Biennial Iowa GIS Conference*, University of Iowa, 10/04/01.
76. 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.
77. 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.
78. 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.

79. Emch, M.E. "Deforestation in Bangladesh," *American Society of Photogrammetry and Remote Sensing*, Washington, D.C., 5/22/00.
80. 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.
81. Emch, M.E. "Relationships Between Flood Control and Disease in Bangladesh," *Association of American Geographers*, Pittsburgh, 4/5/00.
82. 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.
83. 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.
84. 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.
85. 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.
86. 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.
87. 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.
88. 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.
89. Emch, M.E. "Agricultural Development in Southern Belize," *Association of American Geographers*, San Diego, 4/20/92.

Invited Colloquia

1. 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.
2. 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.
3. 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.
4. Emch, M. "Spatial Analysis in Infectious Disease Research" Sun Yat-Sen University, Guangzhou, China, 6/24/13.
5. Emch, M. and Carrel, M. "Integrating Spatial and Genetic Analysis: The Case of Avian Influenza" Anhui Agricultural University, Hefei, China, 3/19/13.
6. Emch, M.; Perez-Hedrich, C.; and Janko, M. "DHS GPS Data Use in Practice" IFC International, Washington, DC, 6/10/13.

7. Emch, M. "Integrating the Effects of Space, Environment, and Social Networks in Cholera Vaccines" Oakridge National Labs, TN, 3/8/13.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. Emch, M.E. Colloquium, "Maps, Medicine and Microbes: Predicting and Preventing Cholera in Bangladesh" Department of Geography, University of Buffalo, 3/16/10.
21. Emch, M.E. Colloquium, "Spatial and Genetic Clustering of Avian Influenza in Vietnam" Department of Genetics, Dartmouth University, 10/28/09.
22. 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.
23. 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.

24. Emch, M.E. Colloquium, "Cholera and Environment Across Scales" Department of Geography, University of Florida, 2/23/09.
25. 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.
26. 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.
27. 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.
28. 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.
29. Emch, M.E. Colloquium, "Environmental and Social Network Analysis in Vaccine Trials." Department of Geography, University of Buffalo, 11/02/07.
30. 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.
31. 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.
32. Emch, M.E. Invited Lecture, "Predicting and Preventing Cholera Using Environmental Information," University of Maine, 10/26/07.
33. 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.
34. 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.
35. 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.
36. 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.
37. Emch, M.E. Invited Lecture, "Cholera Prevention and Prediction Using Spatial Analysis," South China Agricultural University, 2/21/06.
38. 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.
39. 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.
40. 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.
41. 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.

42. 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.
43. 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.
44. 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.
45. 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.
46. 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.
47. Emch, M.E. Invited Lecture, "Remote Sensing in Community Growth," *2nd Annual Course Creation Fellows Symposium*, Institute for Advanced Education in Geospatial Science, 6/11/03.
48. 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.
49. Emch, M.E. Invited Lecture, "Geographical Analysis in Cholera Risk Assessment and Vaccine Research," Korea National Institute of Health, 1/20/03.
50. 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.
51. Emch, M.E. Invited Lecture, "Remote Sensing of Environment," *1st Annual Course Creation Fellows Symposium*, Institute for Advanced Education in Geospatial Science, 6/4/02.
52. Emch, M.E. Colloquium, "Using Geographic Information Systems and Satellite Remote Sensing for Health Research," International Vaccine Institute, Seoul, Korea, 6/12/01.
53. Emch, M.E. Invited Lecture, "Medical Geography: Theory and Methods," Department of Geography, Seoul National University, 6/8/01.
54. 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.
55. 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.
56. 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.
57. Emch, M.E. Colloquium, "Environmental Risk Factors For Cholera in Bangladesh," *Department of Geography Colloquium Series*, The University of Iowa, 11/20/98.
58. 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.
59. 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, “Water-borne Diseases,” Smith Middle School, Chapel Hill, NC, 10/8/12.
2. 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.
3. 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 www.unc.edu/~emch/courses.html)

- 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.
- Research Design (GEOG 703), University of North Carolina at Chapel Hill, Fall 2008, Fall 2009, Fall 2012, Fall 2013.
- Neighborhoods and Health (GEOG 542) University of North Carolina at Chapel Hill, Spring 2007, Spring 2008, Spring 2012.
- 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

- Pam Jagger, PhD, Assistant Professor, Public Policy, NIH KO1 Award 2013-2016 (mentor) and NIH Fogarty Global Health Fellows Program 2013-2014 (mentor) in Malawi.
- 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, NAID (NIH) T32 on sexually transmitted infections 2012-2014 (co-mentor with Bill Miller).
- Carolina Perez-Heydrich, Ph.D., NIEHS (NIH) T32 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 Award, Preliminary Effectiveness Analysis of Universal Rotavirus Immunization, Nicaragua, 2009-10 (on mentorship team).
- Christopher Hurt, M.D., Division of Infectious Diseases, School of Medicine, KL2 Multidisciplinary Clinical Research Career Development Program, National Institutes of Health funded K award, 2010-12 (on mentorship team).
- Jonathon Juliano, M.D., Division of Infectious Diseases, School of Medicine, KL2 Multidisciplinary Clinical Research Career Development Program, National Institutes of Health funded K award, 2008-10 (on mentorship team).

Graduate Student Advisor

- Corinna Keeler, Ph.D. (in progress) Medical Geography.
- Mark Janko, Ph.D. (in progress) Medical Geography.
- Jennifer Winston, Ph.D. (2014) Medical Geography.
- Sophia Giebultowicz, M.A. (2010) and Ph.D. (in progress) Medical Geography.
- Jill Braly, M.A. (2013) Medical Geography.
- Janey Messina, Ph.D. (2011) Medical Geography. [now Post-doctoral Scholar, Oxford University]
- Veronica Escamilla, Ph.D. (2011) Medical Geography. [now Post-doctoral Scholar, UNC]
- Jianyong Wu, Ph.D. (2011) Environment Science and Engineering, School of Public Health. (Co-advisor with Jill Stewart), [now Post-doctoral Scholar, UNC Water Institute]
- Maggie Carrel, M.A. (2007) Ph.D. (2011) Medical Geography. [now Assistant Professor, University of Iowa]
- Elisabeth Root, Ph.D. (2009) Medical Geography, [now Assistant Professor, University of Colorado]

Graduate Student Committee Member

- William Miller, Ph.D. (in progress) Epidemiology, School of Public Health.
- Jabulani Ncayiyana, Ph.D. (in progress) Epidemiology, School of Public Health.
- Kristin Hampton, Ph.D. (in progress) Epidemiology, School of Public Health.
- Anna Cope, Ph.D. (in progress) Epidemiology, School of Public Health.
- Katie Holliday, Ph.D. (in progress) Epidemiology, School of Public Health.
- Maggie Kovach, Ph.D. (in progress) Geography.
- Joseph Rigdon, Ph.D. (in progress) Biostatistics, School of Public Health.
- Alice Wang, Ph.D. (in progress) Environmental Sciences and Engineering, School of Public Health.

- Kelly Houck, Ph.D. (in progress) Anthropology
- Gretchen Cowman DrPH (in progress) Department of Health Policy and Management, School of 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

- 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)

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

Warren Jochem, Ph.D. (in progress) Geography, University of Colorado at Boulder; 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

In Review

1. Emch, M (PI), Juliano, J (PI), Meshnick, S. (CoPI), Miller, W. (CoPI), Hoffman, I. (CoPI), Suchindran, C (CoPI). Impacts of Household and Neighborhood Ecology on Malaria Vaccine Efficacy. National Institute of Allergies and Infectious Disease, National Institutes of Health, RO1, \$ 2,982,296(direct), 2014-19.
2. Nagle, N (PI), Emch, M (CoI), Improving spatial-temporal certainty of population data for health studies. National Institute of Child Health and Development, National Institutes of Health, RO1, \$2,500,000 (direct), 2014-19.

Awarded

1. 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, RO1, \$ 2,243,272(direct), 2014-19.
2. 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, BSC-1339949, \$344,869, 2013-2017.
3. 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.
4. Fang, G (PI), Bailey, SC (PI), Brookhart, A (CoI), Emch, M (CoI). National Health Literacy Mapping to Inform Healthcare Policy, National Institutes of Health, RO1, \$2,071,603 (direct), 2014-19.
5. Van Der Horst , C (PI), Emch (CoI), Ramaswamy, R (CoI), Speizer, I (CoI), Barrington, C (CoI), Maman, S (CoI), Pettifor, A (CoI), Hightow-Weidman, L (CoI), Adair, L (CoI) Miller, W (CoI), Thirumurthy, H (CoI), Hudgens, M (CoI) UNC Wits AIDS Implementation Research and Cohort Analyses Training Grant. D43 Training Grant. National Institutes of Health. \$1,503,040. 2014-2019.
6. 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.
7. 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.

8. 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.
9. 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.
10. Fulbright Senior Scholar Award, New Zealand, 2011.
11. 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.
12. W.N. Reynolds Research Leave, UNC College of Arts and Science, 2010-11.
13. 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.
14. 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.
15. 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.
16. 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.
17. 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.
18. Emch, M.E. (P.I.-UNC); Band, L.; Serre, M. with Columbia University (VanGeen P.I.). Does Arsenic Mitigation in Bangladesh Raise Exposure to Rotavirus and E. Coli? National Institute of Environmental Health Sciences, National Institutes of Health, RO1/ EID, \$1,496,946- total grant, \$349,888-UNC Portion, 2007-10.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.

24. 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.
25. Emch, M.E. (P.I.). Robert Wood Johnson Foundation Health & Society Seed Grant. "Columbia University Infectious Disease Working Group (IDWG)," \$12,000, 2005.
26. 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.
27. 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.
28. 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.
29. 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.
30. 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.
31. 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.
32. 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.
33. 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.
34. Emch, M.E. "Web-based Satellite Image Processing Course Material Development," Provost's Mini-Grant, University of Northern Iowa, \$1200, Summer 2001.
35. 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.
36. Emch, M.E. "Environmental Risk Factors for Groundwater Arsenic Contamination and Arsenicosis in Matlab, Bangladesh: A Pilot Study," Global Health Corps, \$1500, Summer 2000.
37. 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.
38. 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.
39. 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.
40. Emch, M.E. Fellowship, Fulbright Program, Group Projects Abroad, Nigeria, Summer 1999.
41. Emch, M.E. American Institute of Bangladesh Studies Dissertation Fellowship, \$25,000, 1995-1996.

42. Emch, M.E. Association of American Geographers Dissertation Fellowship, 1995-1996.
43. Emch, M.E. Foreign Language and Area Studies Dissertation Fellowship, 1995-1996.
44. Emch, M.E. Foreign Language and Area Studies Fellowship, Summer 1995 (For intensive Bengali language training at the University of Washington).
45. Emch, M.E. Graduate Office Fellowship, Michigan State University, Summer 1995.
46. Emch, M.E. International Travel Grant, Institute of International Health, Michigan State University, 1994.
47. Emch, M.E. Fulbright Scholarship, Bangladesh, 1993.

PROFESSIONAL SERVICE

Editorial Boards and Peer Review

- **Advisory Editor**, Medical Geography, Social Science & Medicine (2005 to Present).
- **Editorial Board**, Health and Place, (2014 to Present).
- **Paper Reviewer** Social Science & Medicine; Health & Place; PLoS One; 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; 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).
- **Reviewer**, United States President's Emergency Plan for AIDS Relief (PEPFAR) eLearning Course Reviewer.
- **Reviewer**, Jacques May Dissertation Award, Health and Medical Geography Specialty Group, Association of American Geographers (2011).
- **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 (7 cases); Promotion to Professor (1 case); 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 21st 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).

Research and Advisory Panels

- Emch, M.E. Experts Meeting on Geospatial Approaches to Monitoring and Evaluation, John Snow Inc., Arlington, VA, 12/05/13.
- Emch, M.E. 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. 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. 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, 5/11-13/00.

Service to University of North Carolina at Chapel Hill

- **Chair**, Department of Geography (2013- present)
- **Member**, Faculty Advisory Committee, Institute for the Environment (2012 to 2016).
- **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 present)
- **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 Education**, 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
 - Medical Geography Specialty Group (Board Member, 2004-08)
 - Remote Sensing Specialty Group (Secretary/Treasurer, 2000-04)
- Population Association of America
- American Association for the Advancement of Science