

Margaret Carrel
Geographical and Sustainability Sciences, University of Iowa

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EDUCATION AND PROFESSIONAL HISTORY

Higher Education

2011 **PhD**, Geography, University of North Carolina-Chapel Hill
2007 **MA**, Geography, University of North Carolina-Chapel Hill
2002 **BA**, International Communication, Summa cum laude, The American University

Professional and Academic Positions

2018 - Present **Associate Professor**, Department of Geographical & Sustainability Sciences, University of Iowa
2018 - Present **Associate Professor**, Department of Epidemiology, University of Iowa
2014 - 2018 **Assistant Professor**, Department of Epidemiology, University of Iowa
2011 - 2018 **Assistant Professor**, Department of Geographical & Sustainability Sciences, University of Iowa

Honors and Awards

2017 **Emerging Scholar Award**, Health & Medical Geography Specialty Group, American Association of Geographers
2016 **Young Investigator Travel Grant**, European Society for Clinical Microbiology & Infectious Disease (ESCMID)
2012 **J. Warren Nystrom Award Finalist**, Association of American Geographers
2012 **Jacques May Dissertation Award**, Health & Medical Geography Specialty Group, Association of American Geographers
2012 **Travel Support**, NSF Workshop "Challenges in Modeling the Spatial and Temporal Dimensions of the Ecology of Infectious Diseases, Ohio State University
2008 - 2011 **Graduate Research Fellowship**, National Science Foundation
2007 - 2011 **NSF IGERT Population-Environment Traineeship**, Carolina Population Center, University of North Carolina

Memberships

American Association of Geographers
European Society for Clinical Microbiology & Infectious Disease
Phi Beta Kappa
Population Association of America

SCHOLARSHIP

Publications

CLAS * System * = Senior Author, Major Contribution, ** = Secondary Contribution *** = Equal Contribution, **** = Minor Contribution

Refereed Articles

1. * Wilson, P., Parr, J. B., Holzmayer, V., Carrel, M., Tshefu, A., Mwandagaliwa, M. K., Muwonga, J., Welo, P. O., Fwamba, F., Kuhns, M., Jhaveri, R., Meshnick, S. M., Cloherty, G. (2019). Dried blood spot-based determination of hepatitis B seroprevalence from a national survey in the Democratic Republic of the Congo. *American Journal of Tropical Medicine & Hygiene*.
2. * Ohl, M. E., Carrel, M., Thurman, A., Mengeling, M., Vander Weg, M., Hudso, T., Vaughan-Sarrazin, M. (2018). Availability of healthcare providers for rural veterans eligible for purchased care under the

- Veterans Choice Act. *BMC Health Services Research*, 18, 315.
3. * Smith, T. C., Thapaliya, D., Bhatta, S., Mackey, S., Engohang-Ndong, J., Carrel, M. (2018). Geographic distribution of livestock-associated *Staphylococcus aureus* in the United States. *Microbes and Infection*, 20(6), 323-327.
 4. ** Suda, K. J., Livorsi, D. J., Goto, M., Forrest, G. N., Jones, M. M., Neuhauser, M. M., Hoff, B. M., Ince, D., Carrel, M., Nair, R., Knobloch, M. J., Goetz, M. B. (2018). Research Agenda for Antimicrobial Stewardship in the Veterans Health Administration. *Infection Control & Hospital Epidemiology*, 39(2).
 5. * Young, S. G., Kitchen, A., Kayali, G., Carrel, M. (2018). Unlocking pandemic potential: prevalence and spatial patterns of key substitutions in avian influenza H5N1 in Egyptian isolates. *BMC Infectious Diseases*, 18(1), 314.
 6. * Carrel, M., Zhao, C., Thapaliya, D., Bitterman, P., Kates, A. E., Hanson, B. M., Smith, T. C. (2017). Assessing the potential for raw meat to influence human colonization with *Staphylococcus aureus*. *Scientific Reports*.
 7. * Carrel, M., Goto, M., Schweizer, M. L., David, M. Z., Livorsi, D., Perencevich, E. N. (2017). Diffusion of clindamycin-resistant and erythromycin-resistant methicillin-susceptible *Staphylococcus aureus* (MSSA), potential ST398, in United States Veterans Health Administration Hospitals, 2003-2014. *Antimicrobial Resistance & Infection Control*, 6(55).
 8. * Carrel, M., Zahrieh, D., Young, S. G., Oleson, J., Ryckman, K. K., Wels, B., Simmons, D. L., Saftlas, A. (2017). High prevalence of elevated blood lead levels in both rural and urban Iowa newborns: spatial patterns and area-level covariates. *PLoS One*, 12(5), e0177930.
 9. ** Young, S. G., Carrel, M., Kitchen, A., Malanson, G. P., Tamerius, J., Ali, M., Kayali, G. (2017). How's the Flu Getting Through? Landscape genetics suggests both humans and birds spread H5N1 in Egypt. *Infection, Genetics & Evolution*, 49, 293-299.
 10. * Mwandagalirwa, M. K., Levitz, L., Thwai, K. L., Parr, J., Goel, V., Janko, M., Tshetu, A., Emch, M., Meshnick, S. M., 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*.
 11. ** Martin, B. E., Sun, H., Carrel, M., Cunningham, F. L., Baroch, J. A., Hanson-Dorr, K. C., Young, S. G., Schmit, B., Nolting, J. M., Yoon, K.-J., Lutman, M. W., Pedersen, K., Lager, K., Bowman, A. S., Slemons, R. S., Smith, D. R., DeLiberto, T., Wan, X.-F. (2017). US feral swine were exposed to both avian and swine influenza A viruses. *Applied and Environmental Microbiology*.
 12. * Carrel, M., Janko, M., Mwandagalirwa, M. K., Morgan, C., Fwamba, F., Muwonga, J., Tshetu, A. K., 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.
 13. * Carrel, M., Young, S. G., Tate, E. (2016). Pigs in Space: Determining the Environmental Justice Landscape of Swine Concentrated Animal Feeding Operations (CAFOs) in Iowa. *International Journal of Environmental Research & Public Health*, 13(9), 849.
 14. ** Young, S. G., Carrel, M., Malanson, G. P., Ali, M. A., Kayali, G. (2016). Predicting Avian Influenza Co-infection with H5N1 and H9N2 in Northern Egypt. *International Journal of Environmental Research & Public Health*, 13(9), 886.
 15. ** Nair, R., Wu, J., Carrel, M., O'Brien, A., Quick, M., Farina, S., Warden, S., Thapaliya, D., Grenier, D., Smith, T. C. (2016). Prospective multicenter surveillance identifies *Staphylococcus aureus* infections caused by livestock-associated strains in an agricultural state. *Diagnostic Microbiology and Infectious Diseases*, 85, 360-366.
 16. ** Girotra, S., van Diepen, S., Nallamotheu, B. K., Carrel, M., Vellano, K., Anderson, M. L., McNally, B., Abella, B., Sasson, C., Chan, P. S. (2016). Regional Variation in Out-Of-Hospital Cardiac Arrest Survival in the United States. *Circulation*.
 17. ** Livorsi, D. J., Goto, M., Carrel, M., Jones, M. M., McDanel, J., Nair, R., Alexander, B., Beck, B., Richardson, K. K., Perencevich, E. N. (2016). Regional variations in fluoroquinolone non-susceptibility among *Escherichia coli* bloodstream infections within the Veterans Healthcare Administration. *Antimicrobial Resistance & Infection Control*.
 18. * Carrel, M., Perencevich, E. N., David, M. Z. (2015). Emergence and Spread of USA300 MRSA, United States, 2000-2013, From Published Reports on 33,543 Isolates. *Emerging Infectious Diseases*, 21(11), 1973-1980.
 19. ** Lund, B. C., Carrel, M., Gellad, W. F., Chrischilles, E. A., Kaboli, P. J. (2015). Incidence-based versus prevalence-based measures of inappropriate prescribing in the Veterans Health Administration. *Journal of*

- the American Geriatrics Society*, 63(8), 1601-1607.
20. ** Eko, K. E., Forshey, B. M., Carrel, M., Schweizer, M. L., Perencevich, E. N., Smith, T. C. (2015). Molecular characterization of methicillin-resistant *Staphylococcus aureus* (MRSA) nasal colonization and infection isolates in a Veterans Affairs hospital. *Antimicrobial Resistance & Infection Control*, 4(10).
 21. * Carrel, M., Bitterman, P. (2015). Personal Belief Exemptions to Vaccination in California: A Spatial Analysis. *Pediatrics*, 136(1), 80-88.
 22. *** Warden, S. E., Forshey, B. M., Farina, S., Kates, A., Nair, R., Quick, M., Wu, J., Hanson, B., O'Malley, S., Shows, H., Heywood, E., Beane-Freeman, L., Lynch, C., Carrel, M., Smith, T. C. (2015). Swine farming is a risk factor for infection with and high levels of carriage of multi-drug resistant *Staphylococcus aureus*. *Clinical Infectious Diseases*, 61(1), 59-66.
 23. * Carrel, M., Patel, J., Taylor, S., Janko, M., Mwandagirwa, M., Tshetu, A., Escalante, A., McCollum, A., Alam, M. T., Udhayakumar, V., Meshnick, S., Emch, M. E. (2015). The geography of malaria genetics in the Democratic Republic of Congo: a complex and fragmented landscape. *Social Science & Medicine*, 133, 233-241.
 24. ** Mosher, H. J., Krebs, E. E., Carrel, M., Kaboli, P. J., Vander Weg, M. W., Lund, B. C. (2015). Trends in Prevalent and Incident Opioid Receipt: an Observational Study in Veterans Health Administration 2004–2012. *Journal of General Internal Medicine*, 30(5), 597-604.
 25. * Carrel, M., Schweizer, M. L., Sarrazin, M. V., Smith, T. C., Perencevich, E. N. (2014). Residential proximity to large swine confined animal feeding operations is associated with increased risk of MRSA colonization at time of hospital admission in rural Iowa veterans. *Infection Control & Hospital Epidemiology*, 35(2), 190-192.
 26. * Carrel, M., Eron, J. J., Emch, M., Hurt, C. B. (2014). Spatial epidemiology of recently acquired HIV infections across rural and urban areas of North Carolina. *PLoS ONE*, 9(2).
 27. *** Winston, J., Escamilla, V., Perez-Heydrich, C., Carrel, M., Yunus, M., Streatfield, P. K., Emch, M. (2013). Deep tubewells protect against childhood diarrhea in Matlab. *American Journal of Public Health*, 103(7), 1287-1291.
 28. * Carrel, M., Emch, M. (2013). Genetics: A new landscape for medical geography. *Annals of the Association of American Geographers*, 103(6), 1452-1467.
 29. * Wan, X. F., Carrel, M., Alker, A., Emch, M. (2013). Perspective on emergence and reemergence of amantadine resistant influenza A viruses in domestic animals in China. *Infection, Genetics and Evolution*, 20, 298-303.
 30. * Carrel, M., Wan, X. F., Nguyen, T., Emch, M. (2012). Highly pathogenic H5N1 avian influenza viruses exhibit few barriers to gene flow in Vietnam. *EcoHealth*, 9(1), 60-69.
 31. * Carrel, M., Emch, M., Nguyen, T., Jobe, T., Wan, X. F. (2012). Population and environment drivers of H5N1 avian influenza evolution in Vietnam. *Health & Place*, 18(5), 1122-1131.
 32. * Carrel, M., Escamilla, V., Messina, J., Giebultowicz, S., Winston, J., Yunus, M., Streatfield, P. K., Emch, M. (2011). Diarrheal Disease Risk in Rural Bangladesh Decreases as Tubewell Density Increases: A Zero-Inflated and Geographically Weighted Analysis. *International Journal of Health Geographics*, 10(41).
 33. * 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*, 55(4), 659-666.
 34. * Carrel, M., Voss, P., Streatfield, P. K., Yunus, M., Emch, M. (2010). Protection from Annual Flooding Is Correlated with increased Cholera Prevalence in Bangladesh: A Zero-Inflated regression analysis. *Environmental Health*, 9, 13.
 35. * Carrel, M., Emch, M. E., Streatfield, P. 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.
 36. * Carrel, M., Emch, M. E., Jobe, R. T., Moody, A., Wan, X. F. (2009). Spatio-temporal Structure of Molecular Evolution of H5N1 Highly Pathogenic Avian Influenza in Vietnam. *PLoS One*, 5(1), e8631.
 37. * Carrel, M., Rennie, S. (2008). Demographic & Health Surveillance: Longitudinal Ethical Considerations. *Bulletin of the World Health Organization*, 86(8), 612-616.
 38. ** Wan, X. F., Nguyen, T., Davis, C. T., Smith, C. B., Zhao, Z., Carrel, M., Inui, K., Do, H. T., Mai, D. T., Jadhao, S., Balish, A., Shu, B., Luo, F., Emch, M. E., Matsuoka, Y., Lindstrom, S. E., Cox, N. J., Nguyen, C. V., Klimov, A., Donis, R. O. (2008). Evolution of highly pathogenic H5N1 avian influenza viruses in Vietnam between 2001 and 2007. *PLoS One*, 3(10).

Books

1. * Emch, M., Root, E., Carrel, M. (2017). *Medical & Health Geography* (4th ed.). Guilford Press.

Refereed Book Chapters

1. * Carrel, M. (2015). Disease at the molecular scale: Methods for exploring spatial patterns of pathogen genetics. P. Kanaroglou, E. Delmelle, & A. Paez (Eds.), *Spatial Analysis in Health Geography* (pp. 101-120). Ashgate.

Reviews

1. Carrel, M. (2013). *Disease Maps: Epidemics on the Ground* (1st ed., vol. 65, pp. 132). Imago Mundi.

Publications In Progress**Journal Article**

- 2019 *Education rather than rurality as a predictor of HPV vaccine uptake in Iowa teenagers*
 2019 *Family or friends?: individual and neighborhood predictors of malaria across varying endemicities in the Democratic Republic of Congo*
 2019 *Global Molecular Epidemiology of Human MRSA, 1960-2015: A Systematic Literature Review*
 2019 *Globalization complicated emergence and spread of H3N2 seasonal influenza A viruses*
 2019 *The changing landscape of Plasmodium falciparum drug resistance in the Democratic Republic of Congo*
 2016 *The role of water treatment program compliance in reducing household diarrhea in rural Haiti*

Grants and Contracts**Funded**

- Aug 2019 - Jul 2021 *Understanding Infectious Disease Risk in the Wake of Hurricanes & Floods in the US*
 Funded by Carnegie Corporation. Award amount: (\$200,000.00). Investigator/s Margaret Carrel (Principal Investigator), Michihiko Goto (Co-Investigator), Eric Tate (Co-Investigator).
- Apr 2015 - Mar 2019 *Epidemiological and spatial models of malaria transmission*
 Funded by NIH. Award amount: (\$2,243,272.00). Investigator/s M Carrel (Co-Investigator), S M Meshnick (Principal Investigator).
- Mar 2017 - Sep 2017 *The ICU Landscape for Rural Veterans*
 Funded by US Department of Veterans Affairs. Award amount: (\$15,600.00). Investigator/s M Carrel (Principal Investigator).

Completed

- Apr 2011 - Mar 2017 *Staphylococcus aureus: Is raw meat a risk factor for colonization and infection?*
 Funded by US Department of Agriculture. Award amount: (\$1,209,417.00). Investigator/s M Carrel (Co-Investigator), T C Smith (Principal Investigator).
- Sep 2013 - Feb 2017 *Spatio-temporal patterns of drug resistant malaria in the Democratic Republic of Congo*
 Funded by National Science Foundation. Award amount: (\$344,869.00). Investigator/s M Carrel (Co-Investigator), M Emch (Principal Investigator).
- Jul 2014 - Jun 2015 *Impact of rural status and distance to nearest VA facility on infectious disease outcomes*
 Funded by US Department of Veterans Affairs. Award amount: (\$14,300.00).
- Aug 2013 - Jun 2014 *Spatial patterns of reported Acinetobacter baumannii incidence and drug resistance*
 Funded by US Department of Veterans Affairs. Award amount: (\$28,652.00). Investigator/s M Carrel (Principal Investigator).
- Jun 2013 - Jul 2013 *MRSA Risk in Veterans and Proximity to Concentrated Animal Feeding Operations*
 Funded by US Department of Veterans Affairs. Award amount: (\$20,744.00). Investigator/s M Carrel (Principal Investigator).
- Apr 2012 - Sep 2012 *MRSA Risk in Veterans and Proximity to Concentrated Animal Feeding Operations*
 Funded by US Department of Veterans Affairs. Award amount: (\$30,536.00). Investigator/s M Carrel (Principal Investigator).

Not Funded

- Jul 2015 - Jun 2020 *Risk assessment of Avian Influenza Virus Infections and Outbreaks in Migratory Birds*
Funded by National Institutes of Health. Award amount: (\$3,414,307.00).
Investigator/s M Carrel (Co-Investigator), X-F Wan (Principal Investigator).
- Nov 2017 - Oct 2018 *Assessing the relationship between livestock production and prevalence of antimicrobial resistance within the US veteran population*
Funded by Centers for Disease Control & Prevention. Award amount: (\$72,346.00). Investigator/s M Carrel (Co-Principal), M Goto (Co-Principal).
- Sep 2013 - Aug 2018 *Landscape Ecology and Evolution of Malaria in the Democratic Republic of Congo*
Funded by National Science Foundation. Award amount: (\$49,049.97).
Investigator/s M Carrel (Co-Investigator), Emch (Principal Investigator).
- Jul 2015 - Jun 2018 *Incorporating Geography & Genetics: Transmission Patterns & Drug Resistance in HIV in North Carolina*
Funded by National Science Foundation. Award amount: (\$309,472.00).
- Mar 2013 - Feb 2018 *Demographic and Social Drivers of Sexually Transmitted Disease*
Funded by National Institutes of Health. Award amount: (\$76,471.70).
Investigator/s M Carrel (Co-Investigator), J Tucker (Principal Investigator).
- Sep 2015 - Aug 2017 *Spatiotemporally adaptive influenza surveillance based on genomics*
Funded by National Institutes of Health. Award amount: (\$275,000.00).
Investigator/s M Carrel (Co-Investigator), X-F Wan (Principal Investigator).
- Aug 2016 - Jul 2017 *Tracking the Emergence and Diffusion of Drug Resistant Staphylococcus aureus*
Funded by Bill & Melinda Gates Foundation. Award amount: (\$100,000.00).
Investigator/s M Carrel (Co-Principal), M Z David (Co-Principal).
- Jul 2014 - Jun 2017 *Incorporating geography and genetics: Transmission patterns & drug resistance in HIV in North Carolina*
Funded by National Science Foundation. Award amount: (\$281,148.00).
Investigator/s M Carrel (Principal Investigator).
- Apr 2014 - Mar 2016 *Spatiotemporally adaptive influenza surveillance based on genomics*
Funded by National Institutes of Health. Award amount: (\$418,591.00).
Investigator/s M Carrel (Co-Investigator), X-F Wan (Principal Investigator).

Invited Lectures and Conference Presentations**Colloquium****Department**

- 2017 Department of Epidemiology Colloquium, *Incorporating Space into Studies of Disease*
Presenters/Authors: Carrel, M

Local

- 2016 *Spatial Analysis of Infectious Disease: The Promise and Problems of Incorporating Genetics into Geography*, Northern Illinois University, DeKalb, Illinois, United States
Presenters/Authors: Carrel, M
- 2015 *New Ground in the Spatial Analysis of Infectious Disease: The Promise and Problems of Incorporating Genetics into Geography*, University of Illinois at Urbana-Champaign, Urbana, Illinois, United States
Presenters/Authors: Carrel, M

Conference Presentation**International**

- 2019 *Mapping MRSA: Using geography to understand drug resistant S. aureus in humans and livestock*, American Association of Geographers, Washington, District of Columbia
Presenters/Authors: Carrel, M
- 2018 *Family or friends? Individual and neighborhood predictors of malaria across seasons in the Democratic Republic of the Congo*, American Association of Geographers, New Orleans, Louisiana
Presenters/Authors: Carrel, M
- 2017 2017 Annual Meeting, *Assessing the potential for raw meat to influence human colonization with Staphylococcus aureus*, American Association of Geographers, Boston, Massachusetts, United States
Presenters/Authors: Carrel, M, Zhao, C, Thapaliya, D, Bitterman, P, Kates, A, Hanson, B, Smith, T

- 2017 International Medical Geography Symposium, *Family or friends? Understanding fine-scale spatial patterns and drivers of malaria in the Democratic Republic of the Congo*, Angers, France Presenters/Authors: Carrel, M, Mwandagalirwa, M K, Parr, J, Emch, M, Meshnick, S
- 2016 2016 Annual Meeting, *Pigs in Space: Determining the Environmental Justice Landscape of Swine Concentrated Animal Feeding Operations (CAFOs) in Iowa*, Association of American Geographers, San Francisco, California, United States Presenters/Authors: Carrel, M, Tate, E Student Presenters/Authors: Young, S
- 2015 2015 Annual Meeting, *White and wealthy equals vaccines aren't health?: Ecologies of personal belief exemptions for childhood immunizations among California kindergartners*, Association of American Geographers, Chicago, Illinois, United States Presenters/Authors: Carrel, M Student Presenters/Authors: Bitterman, P
- 2014 *Higher incidence of community-associated Staphylococcus aureus and methicillin-resistant S. aureus bacteraemia in southern latitudes among 104 United States (US) hospitals: retrospective cohort study*, European Congress of Clinical Microbiology and Infectious Diseases, Barcelona, Spain Peer-Reviewed/Refereed Presenters/Authors: Perencevich, E, Yin, J, Goto, M, Ohl, M, Schweizer, M, Carrel, M
- 2014 2014 Annual Meeting, *Residential proximity to swine concentrated animal feeding operations and risk of MRSA colonization in Iowa*, Association of American Geographers, Tampa, Florida, United States Presenters/Authors: Carrel, M, Schweizer, M L, Sarrazin, M V, Smith, T C, Perencevich, E N
- 2014 *Spatial Patterns of Drug-resistant Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach*, Association of American Geographers, Tampa, Florida, United States Presenters/Authors: Emch, M, Patel, J, Janko, M, Taylor, S, Meshnick, S
- 2014 2014 Annual Meeting, *Spatiotemporal Analysis of Phylogeographic patterns of H1N1 in China 2009-2010*, Association of American Geographers, Tampa, Florida, United States Presenters/Authors: Shang, Y, Long, L, Wan, X-F
- 2013 ASM-ESCMID Conference on Methicillin-resistant Staphylococci in Animals: Veterinary and Public Health Implications, *Residential proximity to large swine confined animal feeding operations is associated with increased risk of MRSA colonization at time of hospital admission in rural Iowa veterans*, Copenhagen, Denmark Peer-Reviewed/Refereed Presenters/Authors: Schweizer, M L, Sarrazin, M V, Smith, T C, Perencevich, E N
- 2013 Infectious Disease Week (IDWeek), *Residential proximity to large swine confined animal feeding operations is associated with increased risk of MRSA colonization at time of hospital admission in rural Iowa veterans*, San Francisco, California, United States Peer-Reviewed/Refereed Presenters/Authors: Schweizer, M L, Sarrazin, M V, Smith, T C, Perencevich, E N
- 2013 International Medical Geography Symposium, *Genetics: A New Landscape for Medical Geography*, East Lansing, Michigan, United States Presenters/Authors: Emch, M
- 2013 International Medical Geography Symposium, *Spatial Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach*, East Lansing, Michigan, United States Presenters/Authors: Emch, M, Meshnick, S
- 2013 *Genetics: A New Landscape for Medical Geography*, Association of American Geographers, Los Angeles, California, United States Presenters/Authors: Emch, M
- 2013 *Spatial Patterns of Malaria in the Democratic Republic of Congo: A Landscape Genetics Approach*, Association of American Geographers, Los Angeles, California, United States Presenters/Authors: Emch, M, Meshnick, S
- 2012 *Population-environment drivers of H5N1 avian influenza molecular change in Vietnam*, Association of American Geographers, New York City, New York, United States

Regional

- 2014 Great Plains Emerging Infectious Diseases Conference, *Residential proximity to swine concentrated animal feeding operations and risk of MRSA colonization in Iowa*, University of Iowa Presenters/Authors: Schweizer, M L, Sarrazin, M V, Smith, T C, Perencevich, E N

- 2013 Great Plains Emerging Infectious Diseases Conference, *Spatial patterns of transmitted drug resistance among acute/recently acquired HIV cases in North Carolina*, University of Iowa Presenters/Authors: Hurt, C B, Eron, J J, Emch, M
- 2012 Great Plains Emerging Infectious Diseases Conference, *Regional variation in population and environmental drivers of H1N1 SOIV in China, 2009-2010*, University of Iowa Presenters/Authors: Liping, L, Emch, M, Wan, X-F

Continuing Education Talks

Local

- 2015 *Hungry Planet: Threatened Geographies of Food*, Iowa City Foreign Relations Council, Iowa City, Iowa, United States Presenters/Authors: Carrel, M

Guest Speaker

College

- 2019 Identifying and Developing a Global Health Research Project, *Geographies of Food and Health*, University of Iowa
- 2018 Research Design in Global Health, *Geographies of Food and Health*, University of Iowa
- 2017 Research Design in Global Health, *Mapping for food research*, University of Iowa
- 2017 Contemporary Environmental Issues, *The Geography of Drug Resistant Staphylococcus aureus in Iowa* Presenters/Authors: Carrel, M
- 2017 Contemporary Environmental Issues, *The Geography of Drug Resistant Staphylococcus aureus in Iowa* Presenters/Authors: Carrel, M
- 2016 Contemporary Environmental Issues, *The Geography of Drug Resistant Staphylococcus aureus in Iowa* Presenters/Authors: Carrel, M
- 2016 Research Design in Global Health, *Mapping for food research*, University of Iowa
- 2015 Research Design in Global Health, *Mapping for food research*, University of Iowa
- 2014 Research Design in Global Health, *Mapping for food research*, University of Iowa
- 2014 Introduction to International Relations, *Thinking Across Scales: Water in Bangladesh from a Geographic Perspective*, University of Iowa
- 2013 Introduction to International Relations, *Thinking Across Scales: Water in Bangladesh from a Geographic Perspective*, University of Iowa
- 2013 Introduction to International Relations, *Thinking Across Scales: Water in Bangladesh from a Geographic Perspective*, University of Iowa
- 2012 Introduction to International Relations, *Thinking Across Scales: Water in Bangladesh from a Geographic Perspective*, University of Iowa

University

- 2019 Epidemiology of Infectious Diseases, *GIS for infectious disease research*, University of Iowa
- 2019 Public Health Data, *GIS for Public Health Data*, Department of Epidemiology, Iowa City, Iowa, United States Presenters/Authors: Carrel, M
- 2018 Epidemiology of Infectious Diseases, *GIS for infectious disease research*, University of Iowa
- 2018 Public Health Data, *Spatial health data and analysis*, Department of Epidemiology, Iowa City, Iowa, United States Presenters/Authors: Carrel, M
- 2017 Epidemiology of Infectious Diseases, *GIS for infectious disease research*, University of Iowa
- 2017 Occupational & Environmental Epidemiology, *Spatial health data and analysis*, Department of Occupational & Environmental Health, Iowa City, Iowa, United States Presenters/Authors: Carrel, M
- 2017 Public Health Data, *Spatial health data and analysis*, Department of Epidemiology, Iowa City, Iowa, United States Presenters/Authors: Carrel, M
- 2016 Epidemiology of Infectious Diseases, *GIS for infectious disease research*, University of Iowa
- 2015 Epidemiology of Infectious Diseases, *GIS for infectious disease research*, University of Iowa
- 2015 Public Health Data, *Spatial health data and analysis*, Department of Epidemiology, Iowa City, Iowa, United States Presenters/Authors: Carrel, M

- 2014 Epidemiology of Infectious Diseases, *GIS for infectious disease research*, University of Iowa
- 2013 Epidemiology of Infectious Diseases, *GIS and Influenza Studies*, University of Iowa
- Invited Lecture**
- College**
- 2013 Applied Infectious Disease Epidemiology Seminar, *GIS & Spatial Analysis: Applications for Epidemiology*, University of Iowa
- 2013 *Water & Health: The Case of Cholera, Arsenic & Bangladesh*, Global Health Club, University of Iowa
- 2013 *Incorporating geography & genetics: The case of drug resistant Staphylococcus aureus in Iowa*, Social Science Interdisciplinary Group, University of Iowa
- Regional**
- 2013 St. Louis Area Mixed Methods Meeting-Iowa Edition, *Spatial Analysis of Population Health: Pitfalls and Potential of Integrating Genetics and Geography*
- Poster**
- International**
- 2016 European Congress for Clinical Microbiology & Infectious Diseases, *Diffusion of clindamycin- and erythromycin-resistant methicillin-susceptible Staphylococcus aureus (MSSA) in United States Veterans Administration Hospitals, 2003-2014: the spread of potential ST398*, ESCMID, Amsterdam, Netherlands Peer-Reviewed/Refereed
Presenters/Authors: Carrel, M, Goto, M, Schweizer, M, Perencevich, E
- 2015 European Congress for Clinical Microbiology & Infectious Diseases, *Emergence and spatial diffusion in the US of methicillin resistant Staphylococcus aureus USA300 versus USA100, 2000-2013: a geographically referenced literature review*, ESCMID, Copenhagen, Denmark Peer-Reviewed/Refereed
- 2014 *Unite For Site, Prevalence and Distribution of Malnutrition in a Rural Haitian area*, New Haven, Connecticut, United States Presenters/Authors: Van der Heide, D, Lindmark, A, Waters, J, Buresh, C
- National**
- 2014 Consortium of Universities for Global Health, *Prevalence and Distribution of Malnutrition in a Rural Haitian area*, Washington D.C., United States
Presenters/Authors: Van der Heide, D, Carrel, M, Lindmark, A, Waters, J, Buresh, C

SERVICE

Profession

- 2011 - Present American Journal of Tropical Medicine & Hygiene, Annals of Epidemiology, Annals of the AAG, Antimicrobial Resistance & Infection Control, BMC Genomics, BMC Infectious Diseases, Bulletin of the World Health Organization, Clinical Infectious Diseases, Health & Place, International Journal of Infectious Diseases, ISPRS International Journal of Geo-Information, JAMA Pediatrics, Parasites & Vectors, PLoS ONE, Public Health Reports, Scientific Reports, Social Science & Medicine, Society for Academic Emergency Medicine, Southeastern Geographer, Spatial and Spatiotemporal Epidemiology, Transactions in GIS, Reviewer, Publications
- 2018 National Science Foundation, Coupled Natural & Human Systems, Reviewer, Grant Proposals
- 2017 American Association of Geographers, Jacques May Thesis Prize, Health & Medical Geography Specialty Group, Reviewer
- 2016 - 2017 American Association of Geographers, Peter Gould Student Paper Competition, Health & Medical Geography Specialty Group
- 2017 National Science Foundation, Coupled Natural & Human Systems, Reviewer, Grant Proposals
- 2016 National Science Foundation, Coupled Natural & Human Systems, Reviewer, Grant Proposals
- 2014 National Institute of General Medical Sciences, SCORE Grants, Grant Reviewer
- 2014 Sustaining Health Award, Wellcome Trust, Grant Reviewer
- 2013 National Geographic Society Young Explorers Program, Grant Reviewer
- 2012 - 2013 National Science Foundation Geography & Spatial Sciences Directorate, Grant Reviewer
- 2011 - 2013 Health & Medical Geography Specialty Group, Association of American Geographers, Officer

At-Large

Department

2014 - Present Graduate Committee
 2014 - Present Scholarship & Speaker Committee
 2018 - 2019 Global Health Search Committee, Chair
 2015 Infectious Disease Epidemiologist Faculty Search Committee, Member
 2014 Administrative Services Coordinator Search Committee
 2011 - 2014 Undergraduate Committee
 2012 - 2013 Global Health Search Committee

College

2017 - Present CLAS - Faculty Assembly, Member
 2016 - Present CLAS - International Studies Faculty Advisory Committee, Track Coordinator, Global Resources & the Environment
 2012 - Present CLAS - International Studies Faculty Advisory Committee, Member
 2012 - Present Global Health Certificate Program Steering Committee, Member
 2013 Global Health Search Committee, Global Health Certificate Program, Member

University

2012 - Present Center for Health Effects of Environmental Contamination (CHEEC) Faculty Advisory Board, Member
 2015 - 2019 Fulbright Award Interviews, Reviewer, Grant Proposals
 2015 - 2018 Stanley Graduate Awards Review Committee, Reviewer, Grant Proposals
 2016 - 2017 Graduate Research Fellowship Program (GRFP) Fellowship Community, Expert Panel
 2015 - 2017 Center for Global & Regional Environmental Research Seed Grant, Reviewer, Grant Proposals
 2015 - Present Central Plains Research Data Center Advisory Panel, Board of Advisors
 2019 - 2020 Geographic Information Science Search Committee, Member
 2017 - 2018 Environmental Ecology Search Committee, Member
 2015 - 2016 Faculty Steering Committee of the Digital Scholarship and Publishing Studio, Board of Advisors
 2012 - 2013 Crossing Borders Executive Committee, Member

Media Contributions

2014 Internet, KOPN Food Sleuth Podcast, International
 2014 Newspaper, Daily Iowan
 2014 Newspaper, Des Moines Register
 2014 Internet, Wired.com
 2010 Internet, Emerging Health Threats Forum
 2008 Newspaper, New York Times Health Research section
 2008 Radio, World Health Organization podcast