



IRS Spring Academy 2022

Investigating Space(s): Current Theoretical and Methodological Approaches: Part 5 – Spaces of Infection



Thursday | 2 June 2022 | 9hs CET | Webinar

Invitation to Public Keynote "Pandemic Influenzas: Space, Genetics, and Landscapes"

by Prof. Dr. Michael Emch | University of North Carolina at Chapel Hill

Influenza viruses are responsible for substantial human morbidity and mortality and continue to present a public health challenge. In addition to humans, influenza viruses can infect birds, pigs, horses, dogs, sea mammals, and other animal species. It has been proposed that pigs are intermediate host "mixing vessels" that generate pandemic influenza strains through genetic reassortment among avian, swine, and/or human influenza viruses. The genesis and emergence of highly transmissible pandemic viruses is complicated and protracted, requiring multiple reassortment events and mutations across years as seen with the 2009 H1N1 influenza pandemic. Since 2009, novel swine influenza arising from reassortment between the emerging 2009 pandemic H1N1 virus and enzootic swine influenza viruses have frequently been detected in swine populations worldwide, most noticeably in China and the US. A number of these novel swine influenza viruses have caused sporadic spillovers to humans and there is a fear that another influenza pandemic may occur. Although evolutionary events (i.e., reassortment and mutations) have been readily documented, it is not yet clear which are typical, which are atypical, which evolutionary events for these influenza viruses increase threats to human and animal health, and which ecological and evolutionary principals are driving such events. This lecture presents how landscape genetics and medical geography theories and methods can be used to conduct studies of how human-environment interactions influence pathogenic characteristics. The case of swine influenza is offered as an example.

Bio:

Prof. Dr. Michael Emch is W.R. Kenan, Jr. Distinguished Professor of Geography and Epidemiology at the University of North Carolina at Chapel Hill (UNC). He is a member of Infectious Disease Epidemiology and Ecology Lab at UNC and he leads the Spatial Health Research Group. He has published more than 180 papers and two books mostly on infectious diseases including cholera, malaria, respiratory infections, tuberculosis, and COVID-19. He has received more than 20 million dollars in research grants to study diverse topics such as the role of population-environment drivers in pathogen evolution, how social connectivity contributes to disease incidence, and using environmental indicators to predict infectious disease outbreaks. He has served on panels for the National Institutes of Health (NIH), National Science Foundation (NSF), the Centers for Disease Control, and the National Academy of Sciences and he has given many speeches on infectious diseases at institutions in more than 20 countries including the United States Senate.

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