**Building Habitat Suitability Model of Ixodes scapularis (Deer/Blacklegged Tick)**  
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**ABSTRACT TEXT:** Tick-borne diseases are an increasing public health concern in the United State. In a recent report from the Centers for Disease Control and Prevention, 57,394 cases of tick-borne diseases were reported in the contiguous United States in 2017. Lyme disease is the most common tick-borne disease in the United States and is transmitted by the Ixodes scapularis (Say) or deer/blacklegged ticks. In Illinois, Lyme disease cases increased significantly from 2000 to 2017. In Illinois, 4,606 cases of tick-borne diseases were reported from 1990 to 2017, with Lyme disease constantly representing the highest number of reported cases. Previous studies indicated that environmental and climatic factors were important in determining the increase of tick populations.

This study uses the historical tick occurrence data for I. scapularis gathered from the Midwest Center of Excellence for Vector-Borne Disease (MCE-VBD) at the University of Illinois at Urbana-Champaign and environmental variables (land cover, soils, bedrock geology) and climatic variables (maximum, minimum, and average temperatures) to build a habitat suitability model of I. scapularis in IL. I will build the model use the R-ArcGIS Bridge and Logistic Regression for the statistical analysis. This project is on-going project, I am now in the stages of collecting and cleaning data and building the model. I am hopeful to have the preliminary results by the end of Spring 2019. In addition to my project, I have applied GIS overlays and spatial analysis methods to describe the uneven geography of risk based on these data sets. The risk maps show that counties along the borders of Wisconsin and Iowa consistently have high risk of Lyme disease, forming hotspots of high risk. Counties in the southeast part of Illinois show low risk of Lyme disease, although I. scapularis ticks exist. Although northeastern Illinois has a high occurrence of ticks, Lyme disease risk is low in this region.

**Investigation of Chronic Arsenic Exposure in Rural Florida Panhandle**  
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**ABSTRACT TEXT:** Chronic, long-term exposure to arsenic can result in adverse health outcomes, but the effects of sources are difficult to assess epidemiologically. Arsenic concentrations accrued by people can be measured using toenail samples and can serve as a proxy for chronic arsenic exposure. The objective of this project is to assess the relationship between environmental arsenic concentrations and chronic arsenic exposure among residents in Escambia and Santa Rosa counties, Florida. We will assess the levels of arsenic collected from toenails of residents in our study area and from their residential water supply, along with data pertaining to demographics and occupational history, and daily arsenic intake questionnaire collected from the same residents. We will analyze the data to determine the relationship between daily arsenic exposure in private well water, previously determined soil and groundwater contamination levels, and human activity.

The importance of this study is to quantify the relationship between the variability of chronic arsenic in the environment and its past use in agricultural and industrial activities (legacy effect). Our work will allow us to quantify the relationship between arsenic in people and the environment.

**Using GIS for Defining and Analyzing Health Demand Locations in Jeddah City**  
*Abdulkader Murad, FCInstCES, Professor, King Abdulaziz University, Jeddah, Saudi Arabia*

**ABSTRACT TEXT:** Health Geography can provide a spatial understanding of a population's health, the distribution of disease in an area, and the environment's effect on health and disease. GIS plays a major and important role in health care, surveillance of infectious diseases, and mapping and monitoring of the spatial and temporal distributions of health events. The aim of this paper is to discuss a GIS application created for defining and analyzing three types of patients’ locations in Jeddah city.

These are diabetes, asthma and hypertension. Data about these three types of patients were created based on health centers registered records. These data are evaluated spatially using several spatial statistical analysis models including kernel and hot spot models. These models are created for exploring and displaying patterns of health events and to show areas of high concentration.