<u>Course Research Project</u>

Names of Individual or Group Members (1 point)

Frank Ofosu and Nandhika Rajmanikandan .

Emerging area you plan to focus on (1 point)

 Informatics in Influenza Virus Impact Analysis

Tentative title of the research project (1 point)

Geospatial Analysis of Influenza Transmission Dynamics and Socioeconomic Determinants

Population(s) you plan on targeting for your research project (2 points)

The target population for this research project will be residents of major metropolitan areas across the United States, with a particular focus on cities with diverse socio economic landscapes. We will specifically target:

1. Urban and suburban communities across different income levels
2. Neighborhoods with varying access to healthcare facilities
3. Areas with different population densities and housing types
4. Communities with diverse racial and ethnic compositions

By focusing on these varied urban populations, we aim to capture a comprehensive picture of how socioeconomic factors influence influenza transmission and impact across different demographic groups and urban settings.

Tentative abstract (3 points)

This research project aims to develop a comprehensive geospatial analysis framework to investigate the relationship between influenza transmission dynamics and socioeconomic determinants. By integrating high-resolution spatial data on influenza incidence with demographic, economic, and environmental factors, we will create detailed maps of influenza hotspots and identify key socioeconomic predictors of outbreak severity.

The project will utilize advanced spatial statistical methods, including Bayesian hierarchical models and geographically weighted regression, to account for spatial heterogeneity in influenza transmission patterns.

Additionally, we will develop interactive visualization tools to communicate findings effectively to public health officials and policymakers. This approach has the potential to enhance our understanding of the complex interplay between social determinants of health and influenza epidemics, enabling more targeted and effective public health interventions.

Citations of three relevant peer-reviewed papers (e.g. journals, conference proceedings) to your chosen topic. (2 points)

1. Charland, K. M. et al. (2011). "Socio-economic disparities in the burden of seasonal influenza: The effect of social and material deprivation on rates of influenza infection." PLoS ONE, 6(2), e17207.
2. Tamerius, J. D. et al. (2013). "Environmental Predictors of Seasonal Influenza Epidemics across Temperate and Tropical Climates." PLoS Pathogens, 9(3), e1003194.
3. Charu, V. et al. (2017). "Human mobility and the spatial transmission of influenza in the United States." PLoS Computational Biology, 13(2), e1005382.