Towards the Integration of Epidemiologic and Bioinformatic Approaches: An Example of Prostate Cancer Health Disparities

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Abstract: African American (AA) compared to European American (EA) men are more likely be diagnosed with aggressive prostate cancer and twice as likely die of the disease. This is the largest disparity of any cancer site. The causes of prostate cancer health disparities are multifactorial, complex, and likely extend beyond self-report race/ethnicity, including multilevel factors from 3 main levels: 1) macro-environment, defined by factors outside an individual, such as where a person lives, family/social circumstances, and environmental exposures; 2) the individual, which includes behaviors, such as smoking, and psychosocial factors, such as stress; 3) biology, which includes the study of genes and proteomic markers. While recent PCa research has focused on biology, capitalizing on available databases and data mining methods to study genetic differences between AA and EA men, these studies focus on inherent risk factors that are not modifiable and that are difficult to translate into expeditious reductions in health disparities. Studying social circumstances, particularly neighborhood effects, or the geographic location in which a person lives, could provide insights into disparities. My research focuses on applying biologic methods to publicly available social datasets to better understand the role of social circumstances in health disparities. I will present the application of my newly developed, neighborhood-wide association study (NWAS) method, which borrows principles from genome-wide association studies, to a dataset linking the Pennsylvania State Prostate Cancer Registry with U.S. Census variables. Future informatics approaches to address complex multilevel data and the interaction across each of the 3 main levels will also be discussed.

Bio: Dr. Shannon Lynch is a new Assistant Professor at Fox Chase Cancer Center. She received her Ph.D. in Epidemiology from the University of Pennsylvania and her M.P.H from the George Washington University. Dr. Lynch is interested in multilevel cancer studies, particularly developing empiric methods, to address the complex, multifactorial nature of cancer. She studies the independent and joint effects of neighborhood exposures and biomarkers on cancer outcomes. She is interested in multidisciplinary and translational research efforts that can take etiologic findings from multilevel studies and translate them into improved interventions that can impact both the patient and the community. For more information, please see: https://www.foxchase.org/shannon-lynch