“Genomics, Machine Learning, and Osteoporosis Risk Assessment“

Abstract: Accurately identifying high-risk individuals is critical to preventing fracture and the subsequent devastating consequences. Substantial efforts have begun to find ways to improve fracture prediction in the field. Generally, integrating new markers of fracture risk in the prediction model and adopting innovative modeling strategies are two essential approaches to improving the accuracy of fracture prediction. This talk will cover several research areas we have focused on: 1) The effects of genomic variants on bone mineral density and fracture risk in Caucasian women and African American women; 2) Evaluating performance of existing FRAX in women with varied race and genetic profile; 3) developing models using machine learning technologies to predict major osteoporotic fracture, and identifying the best performing model for fracture prediction. Our work suggested that genetically-enhanced, highly accurate assessment models by machine learning technologies are likely to improve fracture prediction and thus help clinicians and patients to assess fracture risk better at the individual level.

Bios: Qing Wu, MD, ScD is an Associate Professor in the Department of Environmental and Occupational Health in the School of Public Health and a founding member of the Nevada Institute of Personalized Medicine (NIPM). As the Principle Investigator in the lab of Biostatistics, Informatics, and Research Design (BIRD) in the NIPM, Dr. Wu has studied genetic variants and their association with osteoporosis, fracture, and bone mineral density. His research interests include machine learning, meta-analysis, big-data analysis, bioinformatics, and research design. His current work focuses on using genomic, big-data-driven machine learning approaches to address the challenge in the area of health disparities associated with osteoporosis and fracture. Dr. Wu currently is the Principle Investigator for NIH R15 grant and the Project Leader for the NIH COBRE grant (RP2). Dr. Wu also collaborates with other PIs on numerous NIH grants and provide statistical support.

Research Areas: Osteoporosis Epidemiology, Health Disparities, Fracture Prediction, Machine Learning, Meta-analysis, Big Data Analysis, Bioinformatics, and Research Design

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