

Indian Statistical Institute

Applied Statistics Unit

SEMINAR NOTICE

Speaker: Parichoy Pal Choudhury, American Cancer Society

Title: Statistical methods in absolute risk prediction with applications in cancer

Date: 16 January, 2024

Time: 16:15 PM

Online Platform: Google Meet (<https://meet.google.com/pvj-sdoy-aym>)

Abstract: Risk-stratified disease prevention involves tailoring of health decisions about screening and prevention based on the individualized risk predictions. This requires a comprehensive understanding of the risk factors, including genetic variants, biomarkers, lifestyle/behavioral and environmental factors leading to the development of a model for predicting absolute risk of a disease of interest. Absolute risk model development requires information on relative risks of the risk factors, population-based age-specific disease incidence rates and competing event rates and population distributions of the risk factors. Such a model needs to be validated ideally in independent prospective cohorts before clinical applications. In this presentation, I will describe the iCARE software tool for implementing absolute risk estimation of a disease integrating multiple data sources leveraging the best information available for each of the input parameters and standardized approaches for risk model validation. I will describe a major recent application of this tool in the development and validation of a comprehensive risk prediction model for breast cancer integrating questionnaire-based risk factors and polygenic risk score (PRS). Model validation in two-phase study settings often involve scenarios where expensive biomarkers (e.g., PRS) are measured in smaller subsample of a prospective cohort, where subjects may be selected using complex sampling designs. I will describe a simple method for improving precision of model validation statistics (e.g., AUC) using the partial risk factors from the full cohort and complete risk factors from the subsample. I will show an application in breast cancer risk prediction with questionnaire-based risk factors and PRS.

All are invited to attend.