

Indian Statistical Institute

Applied Statistics Unit

SEMINAR NOTICE

Speaker: Damitri Kundu

Title: A Bayesian joint model for multivariate longitudinal and time-to-event data with application to ALL maintenance studies

Date: 02 May, 2023

Time: 16:15 PM

Venue: ASU Seminar Room

Online Platform Link: meet.google.com/jwo-byah-dze

Abstract

The most common type of cancer diagnosed among children is the Acute Lymphocytic Leukemia (ALL). A study was conducted by Tata Translational Cancer Research Center (TTCRC) Kolkata, in which 236 children (diagnosed as ALL patients) were treated for the first two years (approximately) with two standard drugs (6MP and MTx), and were then followed nearly for the next three years. The goal is to identify the longitudinal biomarkers that are associated with time-to-relapse, and also to assess the effectiveness of the drugs. We develop a Bayesian joint model in which a linear mixed model is used to jointly model three biomarkers (i.e. white blood cell count, neutrophil count, and platelet count) and a semi-parametric proportional hazards model is used to model the time-to-relapse. Our proposed joint model can assess the effects of different covariates on the progression of the biomarkers, and the effects of the biomarkers (and the covariates) on time-to-relapse. In addition, the proposed joint model can impute the missing longitudinal biomarkers efficiently. Our analysis shows that the white blood cell (WBC) count is not associated with time-to-relapse, but the neutrophil count and the platelet count are significantly associated with it. We also infer that a lower dose of 6MP and a higher dose of MTx jointly result in a lower relapse probability in the follow-up period. Interestingly, we find that relapse probability is the lowest for the patients classified into the "high-risk" group at presentation. The effectiveness of the proposed joint model is assessed through the extensive simulation studies.

All are invited to attend.

Please write to SOMENATH DAS somenath1011@isical.ac.in in case you do not receive the invitation link 48 hours before the seminar time.