

Smooth composite link models with applications in spatial and spatio-temporal disaggregation of counts.

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Abstract

Mortality data provide valuable information for the study of the spatial distribution of mortality risk, in disciplines such as spatial epidemiology and public health. However, they are frequently available in an aggregated form over irregular geographical units, hindering the visualization of the underlying mortality risk. Also, it can be of interest to obtain mortality risk estimates on a finer spatial resolution, such that they can be linked to potential risk factors that are usually measured in a different spatial resolution. In this talk, we propose the use of the penalized composite link model and its mixed model representation. This model considers the nature of mortality rates by incorporating the population size at the finest resolution, and allows the creation of mortality maps at a finer scale, thus reducing the visual bias resulting from the spatial aggregation within original units. We also extend the composite link model to the spatio-temporal case where counts are aggregated spatially and temporally.