

# **Application of Bayesian Geo-additive Mixed Latent Variable Model to the Child's Health Problems**

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Childhood diseases and malnutrition are still a major cause of death of children in the developing world. This work focuses on investigating the impact of the important risk factors and geographical location on child morbidity and malnutrition in Egypt. Previous research has usually carried out separate regression analyses for certain diseases or types of malnutrition, neglecting possible association between them. Based on data from the Egypt Demographic and Health Survey of 2008, we apply recently developed geoadditive latent variable models, taking cough, fever and diarrhea as well as stunting and underweight as observable indicators for the latent variables morbidity and malnutrition. This allows studying the common impact of risk factors and geographical location on these latent variables, thereby taking account of association within a joint model. Our analysis identifies socio-economic and public health factors, nonlinear effects of age and other continuous covariates as well as spatial effects jointly influencing morbidity and malnutrition.

**Key words:** Geoadditive latent variable models, Child's Health Problem in Egypt