空间广义线性混合模型及其在预测流行病中的应用

Spatial Generalized Linear Mixed Models with Application to Prevalence Mapping

黄湘云　李再兴

2018 年 5 月

理学院
中国矿业大学（北京）

目录

1. 引言
   - 研究意义
   - 文献综述
   - 主要内容
2. 模型 (SGLMM)
   - 模型结构
   - 计算方法
   - 数据分析
3. 结论与展望

Examples

1. radionuclide concentrations on Rongelap Island
2. childhood malaria in the gambia
3. Loa loa prevalence in Cameroon and surrounding areas

Introduction

Diggle *et al.* (2002)

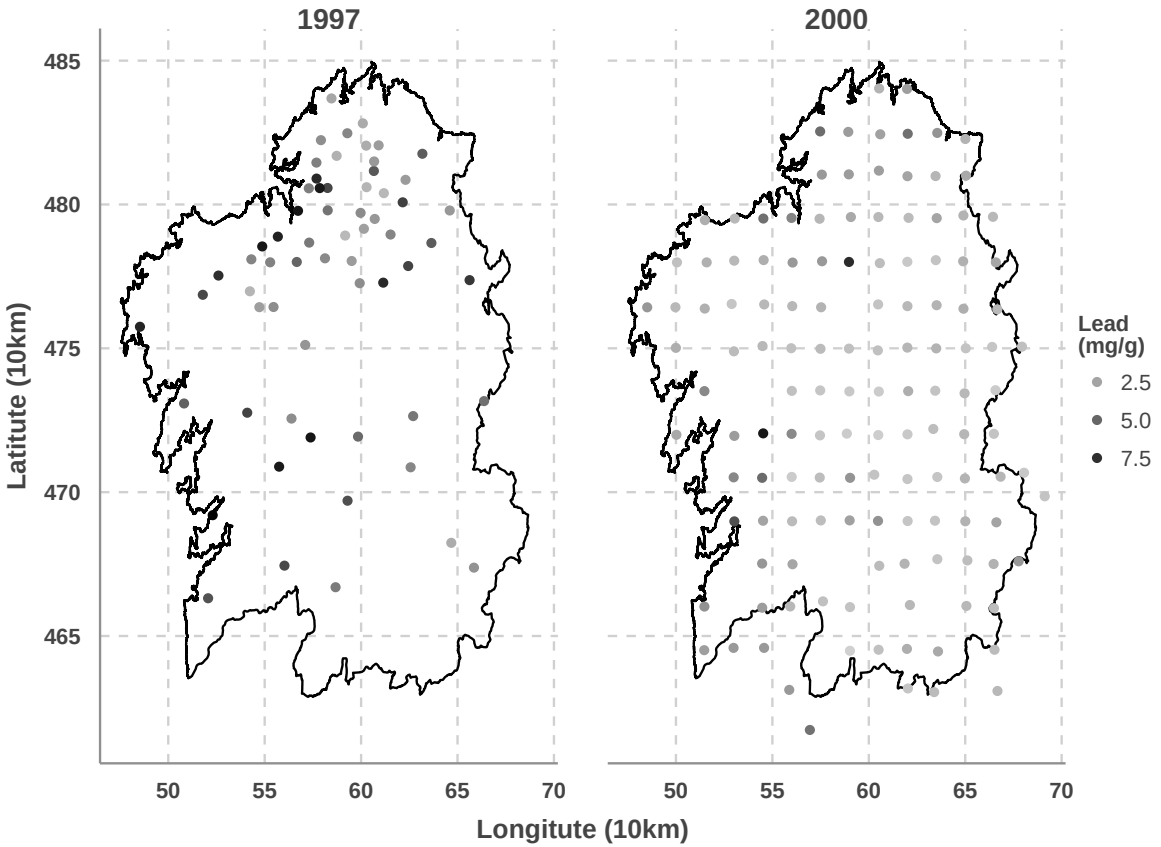
- the effects of child level covariates (age and bed net use)
- village level covariates (the primary health care and greenness of surrounding vegetation)
- separate components for residual spatial
- non-spatial extrabinomial variation

$\mathbb{R}^n$

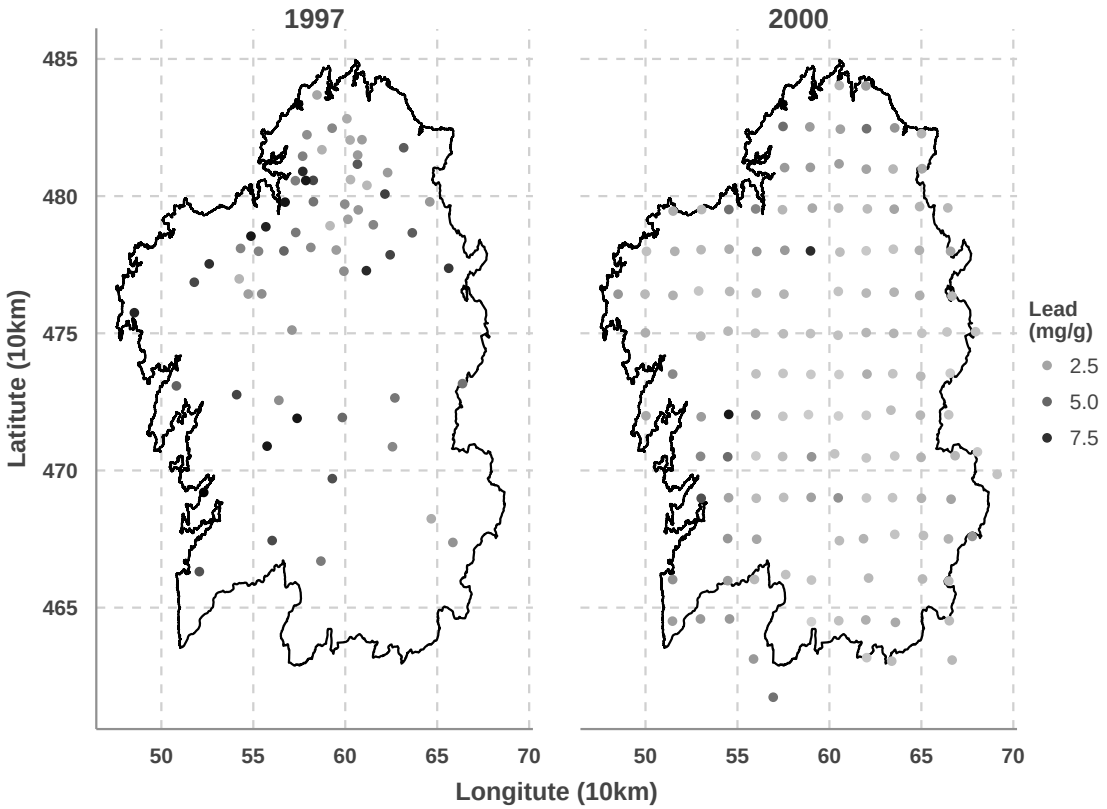
$$\log\{p_{ij}/(1-p_{ij})\} = \alpha + \beta' z_{ij} + U_i + S(x_i)$$

Intro

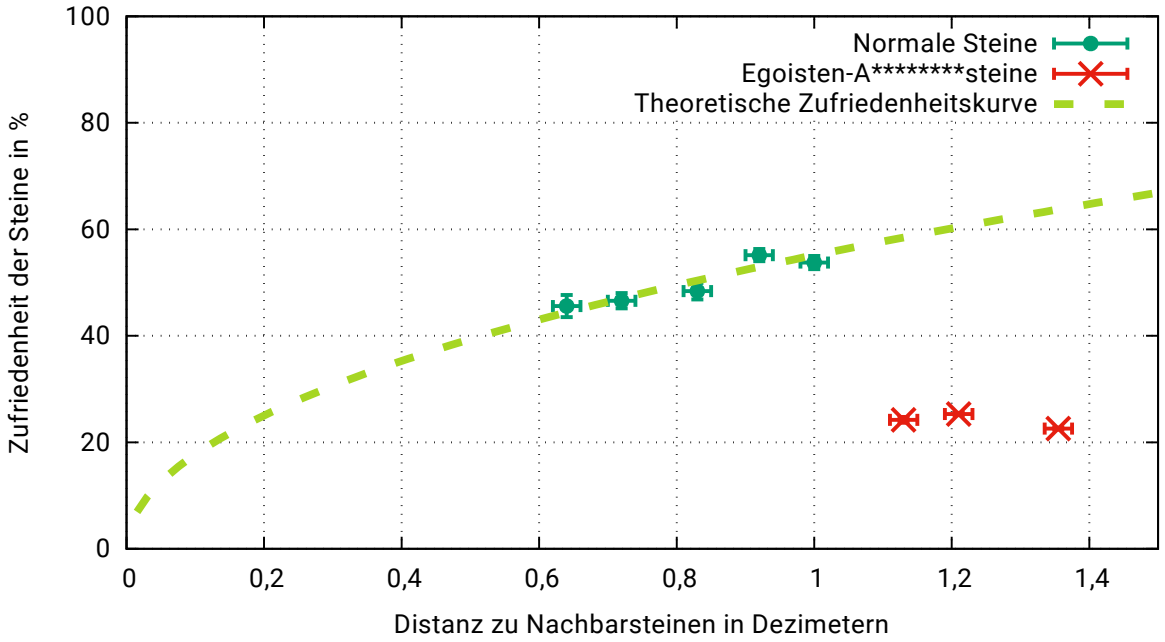
疟疾流行度与植被关系


1997
2000
485
480
475
470
465
Latitute (10km)
50
55
60
65
70
Longitute (10km)
Lead
(mg/g)
2.5
5.0
7.5

谢谢！



MERKE: **Steine sind Perfektionisten!**



MERKE: **Steine sind Perfektionisten!**

参考文献 I

Diggle, Peter, Moyeed, Rana, Rowlingson, Barry, & Thomson, Madeleine. 2002. Childhood malaria in the Gambia: a case-study in model-based geostatistics. *Journal of the Royal Statistical Society: Series C (Applied Statistics)*, **51**(4), 493–506.