

Spatial Generalized Linear Mixed Models with Application to Prevalence Mapping

空间广义线性混合模型及其在预测流行病中的应用
2015 级硕士学位论文答辩

学生：黄湘云

导师：李再兴

专业：统计学

方向：数据分析与统计计算

理学院
计算数学与统计系

2017 年 7 月 3 日

Outline

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

例例 例 例 例

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

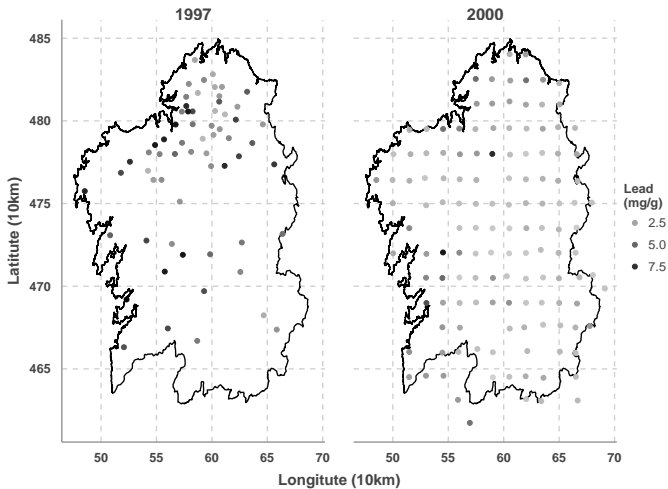
Introduction

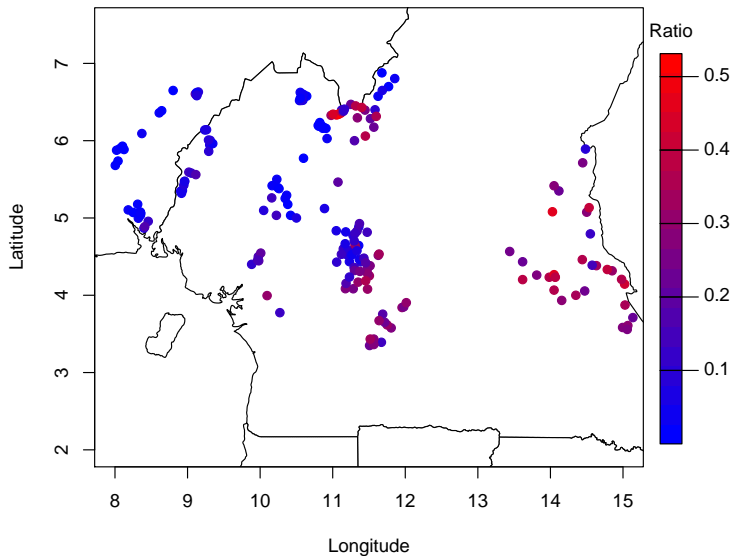
Diggle *et al.* (2002)

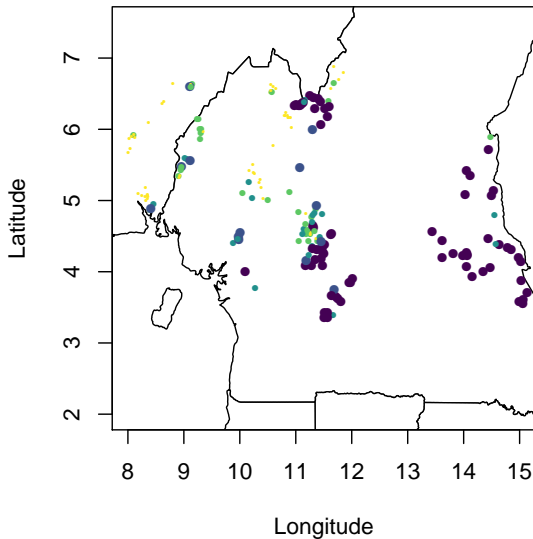
- First item in the list
- Second item
- and so on
 - First item in the list
 - Second item
 - and so on
- the effects of child level covariates (age and bed net use)
- village level covariates (the primary health care and greenness of surrounding vegetation)
- separate components for residual spatial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

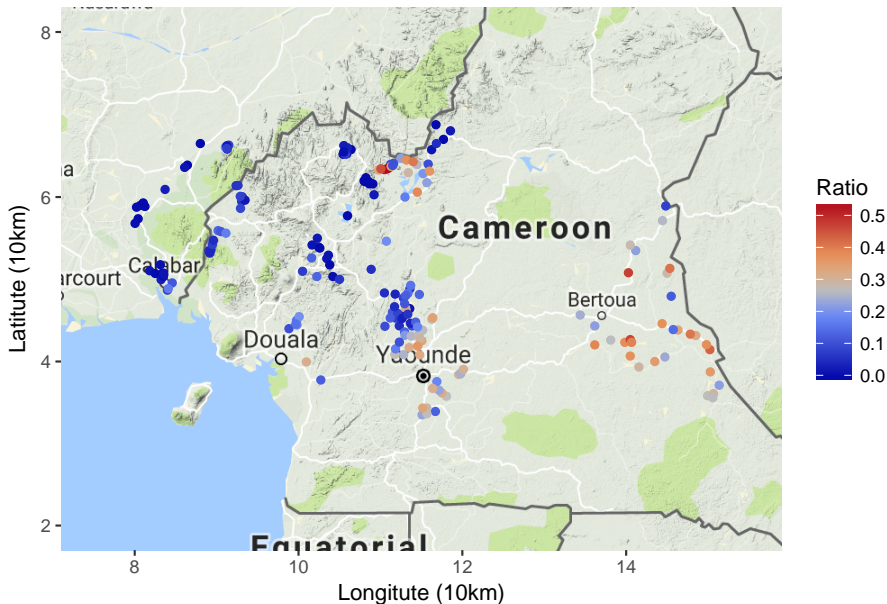
\mathbb{R}^n

$$\log\{p_{ij}/(1 - p_{ij})\} = \alpha + \beta' \mathbf{z}_{ij} + U_i + S(\mathbf{x}_i)$$









Thank You

References 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.

Softwares and Tools



图: GNU R INLA Stan PyMC3

Github



Bioconductor
OPEN SOURCE SOFTWARE FOR BIOINFORMATICS