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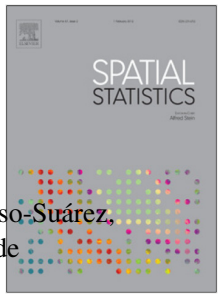

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PII: S2211-6753(16)30168-3
DOI: https://doi.org/10.1016/j.spasta.2018.03.001
Reference: SPASTA 284

To appear in: *Spatial Statistics*

Received date : 29 November 2016
Accepted date : 12 March 2018

Please cite this article as: Espasandín-Domínguez J., Benítez-Estévez A.J., Cadarso-Suárez C., Kneib T., Barreiro-Martínez T., Casas-Méndez B., Gude F., Geographical differences in blood potassium detected using a structured additive distributional regression model. *Spatial Statistics* (2018), https://doi.org/10.1016/j.spasta.2018.03.001

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ACCEPTED MANUSCRIPT

Geographical differences in blood potassium detected using a structured additive distributional regression model

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Abstract

Recently, physicians in an area of northwestern Spain became concerned about the large number of patients whose serum potassium concentrations were above the normal range, as well as differences in the values recorded from one area to another. With the aim of identifying geographical differences in both mean and variability of potassium levels, analyses were performed using modern flexible regression techniques based on a structured additive distributional regression model. In this type of model, every parameter of a response distribution - rather than just the mean - is related to a structured additive predictor. After adjusting for variables such as age, sex, clot-contact time and spatial effects, differences in potassium concentrations were confirmed. The type of distributional regression model used permitted the mean and variance of the potassium concentrations to

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