Author’s response to reviews

Title: Identification of risk factors for involuntary psychiatric hospitalization: Using environmental socioeconomic data and methods of machine learning to improve prediction

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Editor

One of the reviewers expressed concerns about what the current study adds to the literature given the authors' previous study published in the same journal. While the new paper is considered an improvement, it fails to demonstrate any significant associations between the newly added predictors and outcome—all effect sizes were less than 0.20, indicating a minimal effect.

We agree with the reviewer that effect sizes less than 0.20 indicate a minimal effect. In fact, we had already stated this in our manuscript (page 13, lines 287-288: “Therefore, despite their statistical significance, the clinical relevance of these between-group differences is limited”).

However, the reported small effect sizes pertain to the t-tests, which were performed in order to obtain an initial, global comparison between the two large groups of voluntarily and involuntarily treated patients. The findings obtained from the CART analysis are in favor of associations between the newly added predictors (ESED: environmental socioeconomic data) and outcomes for certain subgroups of patients, and not for the entire sample. In line with this, addition of the ESED improved the overall model performance, although the effect sizes over the entire sample had been small. We think that this is an important finding of our analysis (see below our answer to Comment 2 of Reviewer 1). We have added a sentence along this line of reasoning (page 13, lines 288-290: “However, this finding reflects effects at the level of the entire sample and does not preclude these variables from potentially contributing to model performance in our further analysis.”).

Reviewer 1
Modeling involuntary psychiatric hospitalization of people with mental disorders is an important topic. While the topic is very interesting and the statistical work is sound, several shortcomings make it hard to accept this paper for publication. Here are some of them:

(1) The data are from 2011 and too old to reflect any changes in the health care system and immigration policies in Germany.

We thank the reviewer for this comment. It is true that changes in the health care system, the jurisdiction, immigration policies and other societal changes that have occurred since 2011 may interfere with the risk factors that we aimed to identify in our analysis. Therefore, results from analyses of more recent data may be different in some points. We addressed these issues at the end of the Section “Strengths and limitations” (pages 23-24, lines 512-521: “Finally, our data are from 2011. Since then, there have been some important changes both in the mental health system and in society which may modify detention rates and interfere with the risk factors that we aimed to identify in our analysis. Most importantly, the PsychKG NRW (Mental Health Act) was reformed. Furthermore, the refugee crisis has brought a large number of psychologically severely burdened, socially and communicatively disadvantaged people from foreign cultures into the country. Finally, the city of Cologne has been growing fast during the last ten years, so risks associated with urbanicity may be stronger today. Although the main findings of our analysis should remain valid, analyses on newer datasets are clearly needed.”).

(2) From table 3, it is clear that all effect sizes are too small ( 