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Recenzia B
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Prosím nezasahujte do tejto tabuľky

RECENZENT/KA (meno a priezvisko, pozícia, inštitúcia)**: Lukáš Lafférs**
NÁZOV MATERIÁLU: **Long-term returns to local health care spending**
TYP VÝSTUPU*[1]: **analýza**
(pri spoločných výstupoch uviesť aj typy individuálnych vkladov):
ANALYTICKÝ ÚTVAR, REZORT: **Ministerstvo zdravotníctva SR - Inštitút zdravotných analýz**
AUTORI/KY: **Jakub Červený**
SPOLUAUTORI/KY: Jan C. Van Ours
RECENZNÝ FORMÁT*[2]: **2**

PRIPOMIENKY:

P.č.	Pripomienka sa vzťahuje k (strana, odsek):	Text pripomienky*[3]	Odôvodnenie pripomienky	Vysporiadanie sa s pripomienkou*[4]
1		Major comment: My main comment is regarding the definition of visitors. The manuscript makes the impression that the visitors (someone who is treated for AMI in different HLA than the one of his/her		This issue has been addressed by changing the definition of a visitor in the following way: For each patient, the travel time from their home residence and to the

		home HLA) is someone who visited a different district, got cardiac arrest and had to be treated in the nearest hospital. However, in many districts all the patients are routinely transported to the nearest specialised centre. As an example: there is a large specialised cardio-centre in Banská Bystrica. Patients with suspected AMI undergo EKG inspection by paramedics who send this information to the nearest cardio-centre. The inspect this EKG record and decide where should the patient be transported. As long as it is possible to transport the patient with diagnosed STEMI (ST-elevation myocardial infarction) within 90minutes, he or she will typically be treated in the nearest cardio-centre. Other chest-pain sources are treated in the local hospital. The radius 90minutes of driving distance covers many other HLAs. As an example: AMI patients from Brezno district, Zvolen district, even Lucenec district are typically treated in the large cardio-centre in Banska Bystrica. This challenges the definition of		hospital in which they were hospitalised was calculated. The patient is considered as a visitor if he/she has been hospitalised in a non-resident HSA, provided that there *is* a specialised cardiac center capable of performing coronary interventions in their home HSA. If there is no specialised cardiac center in patient's home HSA, they're *not* considered as a visitor if they're hospitalised in a specialised cardiac center, which is up to 90 minutes of travel time from their home. In other words, we expand the catchment area for patients from HSAs with no cardiac centers up to 90 minute of travel time. This should alleviate the concerns raised by the reviewer, since in the first case – if someone lives in a HSA

		visitors - these are not necessarily people who made a “travel decision” (page 3). As the interpretation of causal effect heavily relies on the notion of visitors it would be helpful to clarify the process of someone being labelled as a visitor in dataset in a greater depth addressing the issue I mentioned.		which has a cardiac center ends up hospitalised elsewhere, that (almost certainly) means they were located outside of their home municipality at the time of heart attack, since otherwise they would have been transported to the nearest PCI center (which is in their home residence). For the other case (patients from HSAs with no specialised PCI center), they have to be transported to the nearest PCI center, if the center is up to 90 minutes of travel time since the diagnosis of STEMI (as per official recommendations of the Ministry of Health for management of coronary interventions). Therefore, if they’re hospitalised in a PCI center which is up to 90 minutes of travel time from their home, they’re not visitors. Consequently, if they are hospitalised

				elsewhere (in a hospital/PCI center further than 90 mins from their home), this almost certainly means that they were located away from home, in a non-resident HSA and hence can be considered as visitors.
2		Minor comments: -visitors column in Table 1 are somewhat difficult to follow as the in-hospital and after-hospital costs refer to different HLAs. -in Figure 4, for some HLAs the average in-hospital mortality appears to be exact 0. This suggests that either the sample size was very small or that the complex AMI treatments are not administered there at all for visitors. -it is unclear if the regressions on HLA level are weighted (e.g. by their population size) -notation in eq (4) is missing constant term, error term and subscripts alpha. -should this paper be used for policy, it would be helpful to visualize the models in chapter 5. For non-		- The whole setup now has been changed. Visitors are only informative about causal effects of in-hospital spending on mortality. For the identification of post-discharge spending on post-discharge mortality, we now focus on movers, i.e. individuals who moved between HSAs *before* they experienced a heart attack. This should alleviate concerns about endogeneity related to underlying health of local population. The descriptives table now clearly distinguishes between the two, since (as

		statisticians these may be hard to follow. -notation. it is unclear what the subscript “l” in t_l stand for -specification choice: the local-area spending measure is in log-s, it would be helpful to have some rationale for this choice -on page 21 it is mentioned “duration since heart attack” - how is it measured exactly and what happens to patients who died before they reached the hospital (are they in the dataset) -why does not \delta in eq (9) have d subscript? -the unobserved mixing distribution has a small support, only 8 points. It would be interesting to see if the main conclusions stand even if this was larger, say 3x3x3=27. -some implementation details might be helpful. The model has many parameters and the ML estimation might be difficult. A reader might be concerned about the numerical stability of the solution		correctly pointed out by the reviewer), they refer to different HSAs (visitors are always transported to their home HSA once discharge from hospital). - While this is true (some HSAs have 0 mortality for visitors), they do have mortality for locals. Therefore, we argue that this is simply a “natural phenomenon”. What is more, we now added a fourth equation into the model, which estimates the duration until transfer in the competing risk model. Thus, if it would be the case that low-spending HSAs are more likely to transfer patients earlier to more specialised hospitals, the model should capture this. The estimated coefficients from the transfer equation,

		-what exactly are transfers, what specific form does this piece of information have in the models. -are the numbers in Table 5 conditional? E.g. how one can interpret the 97.4% predicted probability of 37yo patient? -Figures in the appendix would be easier to read if they had legends. -in Table B.1 some comorbidities have positive, some negative coefficients. How should this be read? -there appears to be large differences in the proportion of different types of AMI for locals and visitors in Table B.4, reader might benefit from understanding what is the source of those differences.		however, suggest that this is not the case. - Regressions are not weighted by the population size, but standard errors are clustered at the HSA level. - Equation (4) has been corrected to include the missing terms/subscripts. - While we agree that the models are complex for non-statisticians/policy makers, at the same time, these individuals are mostly interested in the conclusions/results of the paper. The target audience (technical applied economics/health economics journals) usually have sufficient skills to understand the methodology section, therefore we're not

				including visualisation of the model. - The subscript is now removed and the notation was updated. We now define the duration until hospital death/transfer/discharge simply as t, while duration until post-discharge death as t_d. - The choice of logs is purely to align with the previous published literature (see e.g. Doyle (2011)). - The three-point support estimates were tried in the estimation procedure, but the log-likelihood did not converge/improve. As for the numerical stability, as it is the case with ML models, there is never a definite proof whether the result is the true global maximum.

				The usual practice is to try different starting values, if these converge to the same maximum, it is deemed as the solution. We indeed tested the stability of the results as stated above. - Transfer is defined as a transfer to a different hospital following the initial hospitalisation after AMI. As stated in previous reply, transfers are now considered as a separate outcome of the competing risk model. - Yes, the post-discharge mortality predictions are conditional on surviving the initial hospitalisation. - All figures now contain legends. - The comorbidity index was re-defined and there

				was a slight error in coding of the comorbidities in the previous version of the paper, which considered some diagnoses from primary care encounters. The Quan et. al and Bannay et. al papers to which we refer in constructing the index, however, do not consider these. Also, some of the categories had very low counts for certain diseases (like severe liver disease or AIDS), hence we decided to collapse the 17 categories into 8 smaller categories (a practice not uncommon in the empirical health economics literature – a similar collapsing of categories was done for example by Hamilton and Hamilton (1997) Estimating surgical volume-outcome relationships applying survival models: accounting for frailty and hospital fixed effects).

				Virtually all of the comorbidity indicators (except recent AMI) now have negative signs in mortality equations. - With the new definition of a visitors, the vast majority of differences between locals/visitors now disappears (even after formally testing for the differences between the two groups).
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CELKOVÉ HODNOTENIE (recenzent/ka vyplní túto časť po vysporiadaní sa s pripomienkami analytickou jednotkou):

I think the authors have addressed the raised issues in a thorough manner and I have no further comments.

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[1] Výber medzi: 1. analýza (komplexný analytický materiál s návrhmi konkrétnych systémových opatrení); 2. komentár (rozsahovo menší analytický materiál venujúci sa konkrétnemu čiastkovému problému); 3. manuál (metodické usmernenie vyplývajúce z potreby zjednotenia procesov a postupov v konkrétnej oblasti).

[2] Formát 1 pre komentár/manuál (2 recenzenti bez povinného odborného workshopu); Formát 2 pre analýzu (3 recenzenti a povinný odborný workshop).

[3] Do tabuľky značiť pripomienky zásadného metodologického a obsahového charakteru (nie štylistické či gramatické opravy).

[4] Vyplní analytická jednotka: pripomienka bola akceptovaná / pripomienka nebola akceptovaná a zdôvodnenie / pripomienka bola čiastočne akceptovaná a zdôvodnenie.