TERMÍN: 15.06.2022

| xx24500xx |
| Recenzia C |
| Imrich Berta |
| imrich.berta@vszp.sk |

Prosím nezasahujte do tejto tabuľky

RECENZENT/KA (meno a priezvisko, pozícia, inštitúcia): **Imrich Berta, Data scientist, Všeobecná zdravotná poisťovňa**
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**
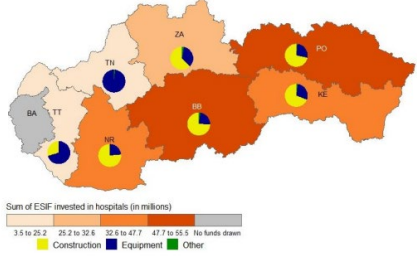AUTORI/KY: **Jakub Červený**
SPOLUAUTORI/KY: - ; - ; - ; -
RECENZNÝ FORMÁT*[2]: **2**

PRIPOMIENKY:

P.č.	Pripomienka sa vzťahuje k (strana, odsek):	Text pripomienky*[3]	Odôvodnenie pripomienky	Vysporiadanie sa s pripomienkou*[4]
1	Str11, Ods1	*...and subcodes corresponding to AMI in the International Statistical Classification of Diseases (ICD) version 10.* It would be great to list all ICD codes used, if some others than I21.XX are used or if some of I21.XX are filtered		The analysis considers all ICD-10 subcodes for AMI, or more specifically, the subcodes in the Slovak version of the ICD-10.

		out.		
3	Str11, Ods1	*and individual characteristics such as age, gender and residence are included.* Is the residence characteristics corrected for group of people who are permanently living in Bratislava without official residency in the city? The correction could be done with healthcare claims by selecting the most frequent region visited, if the region is far away from the official permanent residence.		We agree with the reviewer, that relying solely on the reported place of residence is (unfortunately) very imprecise in the Slovak context. Therefore, as suggested, the residence is defined according to the location of the GP these patients visited, which should be a much better proxy for the actual residence.
2	Str12, Ods1-2 General	In-hospital EOL costs and after-hospital costs might significantly depend on patient age. As they are calculated from individual patient data, age adjustment methods could be used to recalculate those metrics for some standard population and check if they do not fit as better explanatory variables (increased models' R squared).		While we agree that the age-standardization might potentially carry some benefits, we decided to align and follow the published literature (e.g. Doyle (2011)), who does not use the age standardization while

			calculating the aggregated HSA-level cost measures.
3	General	Jan Fidrmuc et al. (ISA, Government Office) studied effect of The European Structural and Investment Funds (EU funds) invested in hospitals on rehospitalisation and mortality rates. They found both positive and negative effect of EU funds on several categories of mortality. However, input included detailed EU funds data, with several expenditure categories, and those could be added to models in this analysis as an additional explanatory variables. Dr Sekelsky, present day Director of Department of Innovative Approaches at The Ministry of Health, took part in the analysis and could be contacted to help with EU funds data.	 Figure 2: Sum of ESIF invested in hospitals (in millions of Euros) and its breakdown by type of expenditure Sum of ESIF invested in hospitals (in millions) 3.5 to 25.2 25.2 to 32.6 32.6 to 47.7 47.7 to 55.5 No funds drawn Construction Equipment Other Data source: ITMS. Note: Hospitals in Bratislava region were not eligible for EU funds.[9] ISA paper: https://www.vlada.gov.sk/data/files/7925_eu-funds-as-a-catalyst-of-change-final.pdf?csrt=10649324231802121867	The effect of structural funds on the mortality is an interesting avenue for research, however, we think this is slightly out of scope of our analysis, which is focused on treatment intensity – the costs accrued by the patient in the hospital for relevant procedures. The structural EU funds are mostly what falls into the fixed costs category (i.e. spending on maintenance of buildings, equipment etc.). A part of this (spending on the medical equipment) should be already reflected in the treatment intensity measure, since more complex medical equipment is more costly to operate, hence should be reflected in hospital

				charges if it was used in the treatment of AMI.
4	Str14, Fig3 Str15, Fig4 Str16, Fig5	At VšZP we found differences in after stroke mortality between hospital owner groups; Agel and Svet zdravia. It would be interesting to at least see those differences in the simple regression plots via scatter categories. Hospitals (or HSA) could be divided to ● mentioned private owners ● managed by state ● managed by self-governing regions		Our main spending measure is aggregated at the HSA level (in other words, it becomes a fixed effect for the particular HSA). This makes further disaggregation problematic. The choice of aggregating at the HSA level is to avoid any concerns with specific referral patterns of emergency services or choice of patient. In other words, the health care market at the level of HSA is more likely to be exogenous than the hospital chosen by the patient or the emergency services, as also noted by Doyle (2011).
5				

6			
7			
8			
9			
10			

CELKOVÉ HODNOTENIE (recenzent/ka vyplní túto časť po vysporiadaní sa s pripomienkami analytickou jednotkou):

I consider all my comments to be either sufficiently answered or incorporated. The interpretation of the negative effects of higher healthcare spending on mortality as causal effects is well justified by the analysis and explained in the last section.

The methodology of this research paper is generaly robust, and the multivariate mixed proportional hazard model is a fitting choice of model to address the group variance and selectivity.

I especially commend the 6th section - Mechanisms. The further investigation of possible mechanisms, causing the discovered effect, led to the identification of a few procedures that are likely to play an important role in reducing post-discharged mortality. The findings could be further investigated in cost-benefit settings and used in policy making and preventive programs in health insurance companies.

---

[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.