TERMÍN: 15.06.2022

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Recenzia A
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Prosím nezasahujte do tejto tabuľky

RECENZENT/KA (meno a priezvisko, pozícia, inštitúcia)**: Wiljan van den Berge, post-doctoral researcher, University of Utrecht, CPB**
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		The goal of the paper is to estimate the causal effect of regional hospital spending on mortality. I think that the analysis of visitors without transfers using in-hospital costs on in-hospital mortality (i.e. column 6 in Table 3) provides the most credible causal		The identifying assumptions for the analysis are now summarized in a separate section (3.2). Furthermore, to estimate causal effects of post-discharge

		estimate of this effect. However, the exact identifying assumptions are not entirely clear from the paper. The use of visitors to a region who get a heart attack helps to disentangle the causal effect of health care spending on health outcomes from the reverse effect of health outcomes in a region on health care spending. Is the only required assumption in the current setup that the health outcomes for visitors are conditionally independent of health care spending in a region? Or are additional assumptions needed for identification? And if so, what are they and why do the authors think that these assumptions hold?		spending on post-discharge mortality, we now additionally focus on a group of “movers”, or individuals who moved between regions *before* they experienced a heart attack. This circumvents the issue of the previous version of the paper, where visitors were not informative about causal effects of post-discharge spending, since they always return to their home region once discharged from hospital.
2		Related to point (1) I have a comment on the use of health care expenditures after discharge. In this case the benefit of using visitors for identification no longer seems to hold. After all, visitors likely return home (especially likely after having suffered a heart attack) and their hospital costs are most likely in their home region. The reverse causality		Answered in 1.

		problem then pops up again, making these results less credible than the ones using in-hospital care for visitors. Hence, causal interpretation of the impact of hospital expenditures after discharge relies on stronger assumptions than those for in-hospital costs, but it is not entirely clear from the paper what these assumptions are. I would suggest to treat these two treatment measures and sets of outcomes differently in the paper.		
3		In general I think the paper would benefit from a clearer focus on the impact of the initial hospitalization, and treat any further hospitalizations or treatments as outcomes rather than as controls or as part of the treatment. First, I'm a little worried that by including controls for treatments that patients receive after discharge, the authors are controlling for outcomes. After all, if initial care is better due to higher spending, we might expect that fewer post-discharge treatments are necessary. Second, I'm not sure that the results where transfers are included are particularly helpful for understanding		We agree and the new version of the paper now treats the transfer as a separate outcome in the competing risk model. The focus is on the initial hospitalization now solely. We also decided to drop any type of treatment explanatory variables in the analysis, in order to avoid conditioning on outcomes.

		what is going on. It is after all not clear where individuals are transferred and why they are transferred there. Furthermore, such transfers could be an outcome of the initial treatment (e.g. worse initial treatment could lead to more transfers). I think transfers should probably also be used as additional outcomes rather than as part of the treatment.		
4		I don't fully understand why the authors chose the treatment measures that are used in the paper. Why are in-hospital end-of-life costs a good measure of hospital spending when we are interested in the impact of spending on mortality? Shouldn't the spending measure then reflect some sort of treatment rather than end-of-life costs? Perhaps this reflects my lack of knowledge of data on healthcare costs. If so, could the authors explain a little more why they chose this particular measure and not something that seems more closely related to heart attack treatments?		The choice of EOL costs is due to the fact that they should reflect treatment intensity. Heart attack is a life-threatening condition, which often requires use of high-cost intensive care unit (ICU) services. The ICU procedures are, however, very similar across various life-threatening medical conditions – they often include use of mechanical ventilation or mechanical blood circulation. Thus, the spending measure based on all such admissions

				should better reflect use of these services in the region. The calculation of the in-hospital spending measure is also used as such in other papers (like Doyle (2011)). However, as a check, we also calculated the EOL costs based only on cardiac-related in-hospital deaths and the distribution of costs closely followed the aggregated one. For post-discharge spending, we focus solely on heart-attack related primary care spending, since the use of diagnostic/monitoring tools is much more specific to the diagnosis – in other words, electrocardiogram or ultrasound of heart are very unlikely used for different diagnosis subgroups.

5		Mechanisms. I'm not sure how much the authors can do here, but it would be very interesting if they could say more about the mechanisms at play. Do they e.g. have data on quality of doctors? Are regions that spend more on health care also able to employ better doctors? Even just correlates between health care spending and indicators of health care quality would be helpful to get a sense of what is driving the findings.		We now include a separate section on mechanisms.
6		In terms of inference, do the authors take into account that the treatment measures (regional spending on in-hospital EOL costs or after-hospital costs) are measured at the regional level? In the linear probability model this would entail clustering the standard errors by region. Is this clustering also taken into account in the MPH model?		Both LPM and MPH models now include standard errors clustered at the HSA level.
7		The increase in hazard rates following discharge could mean that patients are discharged too early (as the authors suggest on page 19). However, it could also mean that measurement of discharge is not fully accurate and		The data from the central death registry are very accurate, therefore it is extremely unlikely that the coroner report would incorrectly assign the place

		instead means that the patient has died in hospital. What happens to the results if the authors include these with those patients who died in the hospital?		of death as home rather than hospital. As we note in the paper, the increase in post-discharge mortality is also a phenomenon present in other countries (Karlsson et. al (1991)).
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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.

[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.