






# The Importance of Examining the Impact of Health Sector Expenditure Growth on Total Factor Productivity (Case Study: Iranian Provinces)

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## 1. Round 1

### 1.1. Reviewer 1

Reviewer:

The claim that “Healthcare costs now account for one-fifth of countries’ gross domestic product (GDP)” appears exaggerated and inconsistent with the following WHO statistics. Please clarify or revise this generalization to reflect actual global averages.

The transition into the research gap is weak. Consider more directly stating the gap in regional-level empirical studies using TFP instead of GDP, to strengthen the justification for the study.

The methodological explanation is somewhat generic. You may improve clarity by explaining why an ex-post facto design is appropriate for the research objective and how it controls for temporal confounding.

The rationale for choosing the PVAR model should be supported by a citation (e.g., Love and Zicchino, 2006 or Holtz-Eakin et al., 1988). Currently, this lacks academic grounding.

The general equation structure is not visible. Consider inserting the actual mathematical equation of the PVAR system with variable definitions to aid reproducibility.

The variable “Number of students (persons)” is used as a proxy for education, but this operationalization is questionable. Clarify why this specific proxy was chosen over more established metrics such as enrollment ratios or literacy rates.

The summary of descriptive findings (e.g., “Tehran, Yazd, and Khuzestan have the highest average values...”) seems redundant. It would be more valuable to interpret these findings in light of Iran’s regional disparities in infrastructure, education, or health policy.

Authors revised the manuscript and uploaded the new document.

### 1.2. Reviewer 2

Reviewer:

When stating “income growth has led to increased healthcare spending...,” it would be helpful to cite a causal framework or reference a theory (e.g., health production function or Grossman model) to underpin this relationship.

The phrase “some studies have shown that improvements in health can lead to GDP growth and vice versa” is vague. Please specify whether the literature supports a bidirectional causal link or not.

“For Iran, the average share of health expenditures in GDP... remained stable at 8.5%, increasing to 7% in 2018” contains a contradictory trend (decrease rather than increase). Please revise for consistency or clarify the timeline and figures.

The presentation of the full VAR output in the manuscript significantly hampers readability. Consider summarizing the significant coefficients and moving the full table to an appendix or supplementary file.

While the results are numerically exhaustive, the authors provide no interpretation of key coefficients (e.g., the significance and sign of lags of HE on TFP). This omission limits the scientific value of the estimation.

The causal loop described between health and growth is a strength. However, no reference is given for this positive feedback mechanism. Please cite relevant literature or models supporting this theoretical link.

Authors revised the manuscript and uploaded the new document.

## 2. Revised

Editor’s decision after revisions: Accepted.

Editor in Chief’s decision: Accepted.