Author’s response to reviews

Title: Studying the impoverishing effects of procuring medicines: a national study

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Author’s response to reviews:

A. Conceptual issues

1. Comment 1: Authors seemed to have addressed the question in the first part of their response. However, in the second paragraph, by introducing the concept “prospective” method of impoverishment calculation, they bring back the confusion. According to the first paragraph, they have used “retrospective method of impoverishment calculation” (using their terminology). Hence, this issue of switching between “prospective” and retrospective” creates a confusion. It also makes the scope of the study too wide.

Thank you for this comment. I think the first paragraph was enough for this question. Please ignore the second paragraph.

2. The question is addressed properly.

3. The authors’ response is confusing it more. Again, they dwell on their two approaches mentioned above – retrospective and prospective methods of impoverishment calculation. They also bring in issue of calculating affordability, which in itself is not clear. The authors’ response is tangential to the actual comment provided by the reviewer.

Thanks very much for the comment, we could rely on the real medial costs which are incorporated in the household's survey. We decided to study the impoverishment effects of these three medicines separately because 1. The household's surveys capture medical cost as one of the household's costs section which potentially might lead to under estimation of some medical costs specially the medicines. 2. We intended to evaluate impoverishment effects of these three most consumed medicines to provide insights for future drugs policy making which could not be done by the overall estimation.

Sorry for the confusion made by our previous response, we replaced the previous response with the above explanation to improve the clarity.
4. The reviewer commented, “an estimate of medical impoverishment from all health expenditures rather than just medication expenditures should be provided to indicate just how significant is the contribution of medication expenses to household impoverishment”. The authors agree to this point and propose to include this in future studies and not in the current one. Although, there is no problem focusing on specific self-purchased medicines, the policy use of this study is very limited, as it assesses a small proportion of the total household spending on health. It doesn’t even cover the entire spending on pharmaceuticals – For example, those purchased with prescription, all other medicines except the three – are not included. Furthermore, other healthcare interventions are not included.

Thank you for this comment. Having the understanding on the impoverishment effect of all health costs is more important and to this end many previous studies have focused on this issue (1, 2). But none of them provide insights on the potential effect of taking medicines on impoverishment. We intended to provide evidence for this concern which can be used coupled with the previous studies. Recently there are some conversation among Iranian health policy makers whether to exclude some of medicines from the insurance benefit package to provided funds to cover some expensive oncology medications. We think to answer the above question and similar future questions, the present results are worthy. Besides we believe the current study is methodologically valuable as it introduces a new approach for considering the issue of health impoverishment effect for scholars.

B. Conceptual issues

1. Question addressed by changing “systematic random sampling” to “stratified multi-stage sampling” per reviewer’s comment.

2. Reviewer commented “… description of how medical impoverishment is determined is incorrect…”. The authors’ have not addressed this very important question properly, as they don’t indicate how this will be incorporated in determining medical impoverishment.

Thank you for this comment. The reviewer mentioned "prior to deduction of medication expenses, the household should not already be impoverished", which is exactly why we inserted the line 132-138 in the manuscript.

3. On the determination of “poverty line” – question (a) is addressed adequately; question (b) - the response is not clear; (c) re-written per reviewers comment; (d) Still the basis (justification) as requested by reviewer, for the calculation of poverty lines for urban and rural areas is not clearly provided – not theory-based; (e) addressed.
B: the response is not clear;

Thank you for this comment. We tried to explain the issue completely. There are two ways to include household total income in a survey. First, using the reported income. Second, using the household consumption expenditure, which is obtained by adding all different reported household expenditures. If we choose income, people usually prefer to under report their real income for their own reasons. Using the household consumption expenditure is deemed to be a better indicator of welfare, especially in poorer countries, and it is easier to measure accurately (3).

To better explain the issue in the article, we changed the sentences in the "data collection" section and highlighted them.

C: Who are these economic experts and how valid is their estimation of poverty lines. Why not inflate officially announced older poverty lines?

Iranian officials does not announce poverty line (in some years) because of some political considerations. Some economic experts declare a poverty line in some years (some of these experts may have political jobs, some are researchers etc.). The numbers are not usually published in scientific articles (so we don't know their methods of estimation). They are usually published in some economic sites or magazines also broadcast in radio etc.

But as researchers we preferred to calculate poverty line ourselves too (called formal poverty line).

Were household sizes taken into consideration in these estimates?

We don't know. That's why we preferred to calculate poverty line ourselves, too.

What is the average household size in Iran?

According to our data set the average household size is 3.6.

d:Still the basis (justification) as requested by reviewer, for the calculation of poverty lines for urban and rural areas is not clearly provided – not theory-based;

Thank you for this comment. The previous reviewer mentioned "The basis for estimating urban and rural poverty lines is not clear (page 6 line 38). If I'm not mistaken these are the household proportions of food expenditures among households between the 45th and 55th percentile adjusted for equivalent household size".
(S)he was not right. The percentiles are based on "food cost share of total costs". the households between 45 and 55 were selected based on this proportion. But the average of the "equivalent food costs" data of those households were calculated and called "poverty line".

We tried to better explain it in the article.

C. Analysis and findings

1. On the finding of Table 1: the authors’ response does not present a convincing counter-argument. They have not defended that the finding is not trivial.

Thank you for this comment. The sample size of rural households is 19390. If 0.2% of them which is around 3878 households fall under poverty line the figure is not small. But whether all of the households use this drug. Of course not. Therefore we should multiply the figure to the probability of using this drug, too. Then, the result (21 households) is logical.

2. Author comments “it would seem that there are only 10,500 rural households in the country, which is highly unlikely. Authors may want to check whether they need to inflate findings using survey weights that take into consideration sampling effect.” Authors do not seem to have understood this question; hence, they have not addressed it properly. I would infer from the reviewer’s comment that he is well aware that this is the sample of rural households. (s)he wants them to inflate the sample using the survey weights.

Thank you for this comment. We checked the calculations again. Everything was right. We can explain how we obtained one of the final figures of the table (as an example). Again we emphasize all of our calculations were based on previous publications which we referred to in the references of the manuscript and we inserted their names at the end of this revision file.

The absolute impoverishment and unaffordability of metformin among urban households assuming informal PL is 0.2% which is equal with 0.002. This figure should be multiplied by 18854 (the urban sample size) and multiplied by 8.5% (which is equal to 0.085 and shows the diabetes prevalence in Iran). Finally 3.205 is achieved. This calculation is applied to every scenarios.

We explained in the "scenario section" that the possibility of disease in the household is considered in the calculations.

3. On “short courses of amoxicillin [used for acute infections] resulting in the same level of impoverishment as the other two that are used for chronic diseases”: the reviewers’ response is not informed by data; it is apparently mere speculation.
Thank you for this question. Like the answer of previous question, final results depends on the prevalence too. We see the prevalence of use of this drug is high compare to other two drugs. Also, in the real word we obviously see the recurrence of such diseases (like sinusitis) is high.

D. Discussion

1. The reviewer emphasizes on the policy relevance of the findings for financial risk protection provided the analysis is correct (numbers of households impoverished by medication cost appear low). The authors’ response may be plausible (in a good health system, there is likely to be better financial risk protection; hence, low % of people that are impoverished due to health spending). However, it may also be due to serious limitation of the study (focused only on 3 self-purchased medicines). This relates with one of the earlier comments of the reviewer – to use total household expenditure on health rather than only 3 medications.

Thank you for this comment. Other studies with prospective method selected just some drugs, too (not a total household expenditure) (4, 5). If you compare our results with those studies, then the low % of households that are impoverished, may be because in Iran's context "drug" is not expensive. Pricing of the "drug" is really different from other countries and a kind of subsidy is allocated to the producers to reduce the price. Therefore drugs are rather cheap (but it depends on the type of the drugs too) in comparison to the other countries. In fact these drugs are rather cheap in comparison to most of other drugs. This article shows although the price of the drugs are low, some families can't simply afford them.

It is interesting to note that in Iran the policymakers are thinking and researching to understand whether they increase the price of the drugs (to reach their real price) or not. Also they are thinking whether they continue this kind of drug subsidy allocation or remove the subsidy or allocate the subsidy to the insurance companies instead or other possible selections. So this study can provide them some useful insights.

2. About not being able to take into account households that are unable to afford care and thus had to forgo care: Not substantively addressed. The authors main answer is “we have used prospective method”, which does not provide a substantive theory-based or empirical argument.

Thank you for this comment. We think the concern raised is answered with the fact that many households who are unable to afford to visit a doctor prefer to purchase the medicines directly from the pharmacy (self-medication), i.e. they might forgo some medical interventions, or medical consultations but they usually do not forgo buying medicines (6).


