Review 1: "Antibiotic Prescribing in Remote Versus Face-to-Face Consultations for Acute Respiratory Infections in English Primary Care: An Observational Study Using TMLE"

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**RR:C19 Evidence Scale** rating by reviewer:

- **Reliable.** The main study claims are generally justified by its methods and data. The results and conclusions are likely to be similar to the hypothetical ideal study. There are some minor caveats or limitations, but they would/do not change the major claims of the study. The study provides sufficient strength of evidence on its own that its main claims should be considered actionable, with some room for future revision.

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**Review:**

The pre-print entitled “Antibiotic prescribing in remote versus face-to-face consultations for acute respiratory infections in English primary care: An observational study using TMLE ” by Vestesson et al. raised concern for the remote consultations for acute respiratory infections (ARI), in the sense that clinicians may tend to prescribe unnecessary antibiotics to adults, as compared to face-to-face consultations. If it is true, then policymakers ought to take that into account when promoting and regulating “telemedicine” because antibiotic resistance can threaten disease/epidemic development and management. However, certain flaws may exist in the study.

First, the conclusions made in the article are about the associations between remote consultations and the prescription rate. However, the TMLE is a method for estimating causal effects. The imprecise language may be misleading.

Second, different regions should be considered as different clusters [1]. Taking that information into consideration may remove part of the selection bias. This can be done, for example, by adjusting for the probability of being in a specific region given selected covariates [2].

Third, the current study is a subgroup analysis, stratifying the population by adults and children and estimating the effects separately. Considering the age group as an effect modifier and estimating the subgroup effects from the whole population may increase the power and reduce the variability of the estimation [3]. It would also be beneficial to investigate infection type and antibiotic type as effect modifiers [4].

Fourth, using each consultation rather than each individual as observations may violate the stable unit treatment value assumption. This is because the consultations from the same individual may be correlated. For example, a patient may exaggerate their symptoms to get the prescription in each consultation.

Fifth, the study may miss some critical confounders, which makes the no unmeasured confounding assumption unlikely to hold, though the reviewer acknowledges this may be due to the data collection mechanism.
Sixth, to reach the optimal efficiency and keep the estimator unbiased, the covariates in the outcome should include all the covariates that are associated with the outcome, and the covariates in the propensity score model should include not include the covariates that are only associated with the treatment (in this case, having a remote consultation) [5]. It seems that a same set of covariates were used in both models. In addition, the authors stated, “We also adjusted for variables that were identified by experts to be associated with either antibiotic prescribing or having a remote consultation, instrumental variable”, which is unclear if the instrumental variables were included for adjustment.

Seventh, since the covariates used for adjusting for confounding were not entirely sure to be confounders, it may be beneficial to conduct variable selection in the context of causal inference [6]. It is also possible to incorporate the structures among covariates into such variable selection [7, 8].

Overall, this work utilized a comprehensive dataset to investigate the potential relationship between remote consultation and antibiotic prescription rates. Concerns about escalating antimicrobial resistance should be considered in the decision-making about the remote consultation. However, a more appropriate study design and methods implementation should be employed.

References:


