

Dear Prof. Lo Monaco and Editors,

We are pleased to submit the paper entitled "*Estimated Covid-19 burden in Spain: ARCH underreported non-stationary time series*" for your consideration. In this paper, a new method to fit misreported non-stationary time series using Bayesian synthetic likelihood estimation is presented. The proposed methodology can be very useful in the context of a pandemic with a large proportion of asymptomatic cases and with an explosive behaviour at some stages, as the present Covid-19 situation, as it provides decision makers with a more realistic picture of the pandemic evolution. Its performance is checked by means of a comprehensive simulation study in several realistic scenarios and its usage is illustrated through an analysis of the evolution of the Covid-19 epidemic in Spain.

In view of the above, we consider that this work may be relevant for the readers of *BMC Medical Research Methodology* and that the examination of the manuscript will indeed show the top quality of our research, in accordance with this journal's high standards.

Thank you very much for your time and attention.

Yours sincerely,

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