

PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Healthcare resource utilisation and costs of hospitalisation and primary care among adults with COVID-19 in England: a population-based cohort study
AUTHORS	Yang, Jingyan; Andersen, Kathleen; Rai, Kiran; Tritton, Theo; Mugwagwa, Tendai; Reimbaeva, Maya; Tsang, Carmen; McGrath, Leah; Payne, Poppy; Backhouse, Bethany; Mendes, Diana; Butfield, Rebecca; Naicker, Kevin; Araghi, Mary; Wood, R; Nguyen, Jennifer

VERSION 1 – REVIEW

REVIEWER	Friedman, Gerald UMass Amherst, Economics
REVIEW RETURNED	22-Jun-2023

GENERAL COMMENTS	<p>This is an important contribution on a matter of urgent public policy. Assessing treatment for the entire population provides absolutely vital information for understanding how the healthcare system responded to the pandemic.</p> <p>Three minor caveats from the data analysis:</p> <ol style="list-style-type: none">1. It would be useful to include an assessment of outcomes in the empirical review. Did these treatments have an observable impact on mortality and was this the same for different groups? To be sure, this would be a different paper, one that I look forward to reading.2. It appears that the risk criteria assessments have little predictive value in assessing the need for hospitalization or LoS of different patients3. It is surprising that immunocompromised status has so little impact on LoS or critical care. <p>By assessing the financial costs of early Covid (pre-Delta, pre-Omicron) hospitalization and primary care, this work provides vital guidance to policy-makers both in preparing for the next epidemic and in considering the financial costs and benefits of various interventions, such as investment in vaccine distribution in general and in targeted populations. It may also highlight the financial benefits of investment in smoking prevention and weight loss programs.</p> <p>For a reader in the United States, the paper also highlights the higher prices charged for medical care in the US than in the UK. While LoS and other metrics are comparable to the US experience, and mortality rates a little lower, the median cost of primary care and, especially, the cost of hospitalization are a fraction the costs for the US.</p>
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REVIEWER	Dlouhý, Martin
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	Prague University of Economics and Business, Econometrics
REVIEW RETURNED	30-Jun-2023

GENERAL COMMENTS	<p>The objective of the paper is to estimate resource utilisation and costs associated with COVID-19 in adults in England. The studied patient groups - primary care cohort and hospitalised cohort - are sufficiently large. The retrospective study design is appropriate in this case. I need some clarifications.</p> <ol style="list-style-type: none"> 1. In the abstract and on page 5: " 4 weeks following positive test", in contrast with page 4, describing the definition of the cohorts "84 days after 84 days after their positive test results." Do I misunderstand this? 2. Based on the available data, is it possible to provide a national estimate of total utilisation and cost? (It is not necessary) <p>The study brings a piece of new and valuable information on the COVID-19 pandemic. I can recommend the publication of this cost-analysis paper after one clarification mentioned above.</p>
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VERSION 1 – AUTHOR RESPONSE

Reviewer 1 Comments:

1. It would be useful to include an assessment of outcomes in the empirical review. Did these treatments have an observable impact on mortality and was this the same for different groups? To be sure, this would be a different paper, one that I look forward to reading.

Response: Thank you for this comment; we agree this would be an important topic to explore in a future study. However, the aim of this study was to describe the economic burden of COVID-19 in the adult population. Whilst the questions around assessing treatment impact on outcomes such as mortality are valuable, it lies outside of the scope of this work.

Also, we agree that assessing HCRU and associated costs among those with a COVID-19 related death would have been interesting to report. However, we chose not to include this as an outcome of this study as COVID-19 related mortality data (obtained via the Office for National Statistics Deaths Registration data: CPRD linked data | CPRD) is not fully available for the duration of the primary care cohort follow-up.

2. It appears that the risk criteria assessments have little predictive value in assessing the need for hospitalization or LoS of different patients.

Response: We agree with this comment that minimal differences in HCRU were observed across the risk groups, particularly in the hospitalised cohort. This observation is acknowledged in the Discussion.

3. It is surprising that immunocompromised status has so little impact on LoS or critical care.

Response: We agree with this observation. However, this might partly be explained by the smaller sample size of immunocompromised patients in the hospitalised cohort (n=181), which we have acknowledged it as one of the Limitations. Future studies are needed to better assess the association of immunocompromised status and LoS.

4. By assessing the financial costs of early Covid (pre-Delta, pre-Omicron) hospitalization and primary care, this work provides vital guidance to policy-makers both in preparing for the next epidemic and in considering the financial costs and benefits of various interventions, such as investment in vaccine distribution in general and in targeted populations. It may also highlight the financial benefits of investment in smoking prevention and weight loss programs.

For a reader in the United States, the paper also highlights the higher prices charged for medical care in the US than in the UK. While LoS and other metrics are comparable to the US experience, and mortality rates a little lower, the median cost of primary care and, especially, the cost of hospitalization are a fraction the costs for the US.

Response: We appreciate these comments. Although assessing the economic impact of broader public health interventions is outside the scope of our work, we agree that it is important to consider in further researches, which we have now acknowledged in the Discussion.

Also, COVID-19 related cost data is sparse from ex-U.S. and we agree the comparisons made should be interpreted with caution, given differences in healthcare systems, which is noted in the Discussion.

Reviewer 2 Comments:

1. In the abstract and on page 5: " 4 weeks following positive test", in contrast with page 4, describing the definition of the cohorts "84 days after 84 days after their positive test results." Do I misunderstand this?

Response: Thank you for your comment and apologies for the confusion here. We are assessing outcomes during the acute phase of COVID-19 (i.e. ≤ 4 weeks following positive test). Separately, when considering patients for the mutually exclusive cohorts we have assessed whether a patient had a COVID-19 related hospitalisation within 84 days of testing positive. Those that met that criteria were included in the hospitalised cohort.

We have further clarified these differences within the abstract, and also in the manuscript.

2. Based on the available data, is it possible to provide a national estimate of total utilisation and cost? (It is not necessary)

Response: Thank you for this suggestion. This study aims to assess healthcare resource utilisation and costs at a patient-level (rather than national level). However, we appreciate that there is merit in estimating the national level costs and therefore have included this as a suggestion for future research in the Discussion.

VERSION 2 – REVIEW

REVIEWER	Friedman, Gerald UMass Amherst, Economics
REVIEW RETURNED	09-Dec-2023

GENERAL COMMENTS	This paper addresses a critical question in the economics of COVID-19: the cost of care for those with COVID, distinguishing between those hospitalized and those treated by their primary care provider, with some breakdown according to comorbidities and age. The primary findings are hardly surprising: hospitalization is very expensive and is especially common and especially expensive for those who are older, obese, suffering from other commodities (including poverty) or had smoked in the past. These
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	<p>findings are solid and important for those planning for the expense of COVID.</p> <p>Many of these characteristics are not susceptible to short-term adjustment through policy, and these findings regarding the cost of COVID for infected populations of particular set (exogenous) conditions are, therefore, important for planning but less so for policy. Nonetheless, the paper has great significance for policy in another dimension: it clearly demonstrates the benefit not only in lives and hospitalization but also in \$ (sorry: £) of vaccination. Virtually no one was hospitalized with full vaccination. We all knew already that vaccination saves lives; now we also have a direct measure of how many HCRU and health care £ it saves.</p>
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