**We are grateful for the opportunity to revise our paper and wish to especially thank the two reviewers for their comments, all of which were very positive and have helped to make the paper stronger. We are very happy to have addressed all of the points raised by the reviewers.**

Reviewer #1:

* The authors analyzed of a random sample of COVID preprints published on four preprint servers to assess the proportion of papers with open data and open code. Assessments were performed using an open source tool (ODDPub). They report that most COVID preprints are missing open data and open code.
  + **No response needed.**
* While the authors use the word reproducibility to describe their research into open data and open code in COVID-19 preprints, this term appears to be far to broad. The authors seem to be focused on the ability to replicate the results that the original authors obtained given the data and analysis code. They are not referring to the ability to repeat the experiment by collecting new data, perform a conceptual replication, etc. Somewhere in the manuscript, they mention the inability to reproduce on of the major COVID models, despite the absence of data and code, due to insufficient information about the methods. A reminder of the importance of factors beyond data and code for reproducibility (e.g. quality of meta-data, methodological reporting, availability of required software packages to run code) would be beneficial , especially when discussing study limitations.
  + **We reviewed the literature and found that there are different definitions of reproducibility that are used in different fields, which is the difference that the reviewer is referring to. We have added a paragraph to the introduction defining reproducibility and distinguishing between reproducibility and replicability, and added a particular relevant citation that surveys different fields. We have also added a paragraph in Section 4.4 addressing the need for more than just open data and code for reproducibility.**
* In the first paragraph of the introduction, the authors note that preprints are used to share results faster. Some scientists also use preprints to obtain feedback on their work prior to publication.
  + **The reviewer is correct, and we have updated this.**
* The description of aRxiv as a general preprint server may not be accurate - it has high rates of usage by fields like physics and computer science.
  + **The reviewer is correct, and we have updated this.**
* Please use research resource identifiers (RRIDs) for software and tools (e.g. ODDPub, R). RRIDs can be looked up using the RRID portal.
  + **We have added RRIDs for ODDPub and R within the text.**
* Given that ODDPub is used to assess the main outcomes, performance data for ODDPub should be specified.
  + **The reviewer is correct. We have added the sensitivity and specificity values for ODDPub open data and code detection under Section 2.2.**
* The absence of validation data for the use of ODDPub on SocArxiv and Arxiv is a significant concern. ODDPub searches in part for specific repository names. If authors in these fields are using different repositories, the tool would not detect them and results may be systematically biased towards lower values. Validation assessments for these two repositories would greatly strengthen the paper.
  + **We thank the reviewer for raising this important point, and related ones later as well. We have removed SocArvix from the main content of the paper. We instead have added an appendix that makes the point the reviewer raises here, shows some initial analysis, and recommends steps for changes if future work wanted to include SocArxiv.**
  + **With regard to arXiv, we have manually gone through a sample of the papers and added details of specificity and accuracy.**
  + **As part of addressing this point, we also found a few unexpected false negatives from ODDPub and have additionally added a paragraph about this.**
* The authors do not describe how they linked preprints to publications. Previous studies have shown that among preprints listed as unpublished based on the linking algorithms used by repositories, approximately 50% are actually published. Betters algorithms have been proposed (e.g. see work by Guillaume Cabanac). The date on which publication status was checked should also be specified, as the length of time that the preprint has been posted is a strong determinant of publication status over the first 18-24 months.
  + **We have added details about our process here, which was to rely on the data provided by the APIs. We have added the reference to our discussion of this issue. We have also added their point about the date being relevant.**
* A comparison of ODDPub results vs. author fields for SocArxiv would be interesting.
  + **We have added this in an appendix that describes compares open data predicted by ODDPub versus author-provided links. We would see considerable benefit from future work that did involve SocArxiv as it would enable two points of data for ODDPub verification.**
* The data display generally feels quite inefficient and opaque. The role of the control group is unclear, as the authors present all analyses for the COVID preprints first, followed by all analyses for the 2019 preprints. This means that the graphs needed to compare the two are pages apart. If the authors did not intend to statistically compare the 2019 and COVID preprints, then it would not be appropriate to place them on the same graph. However, placing them in separate figures that are close together, or in separate panels of the same figure, would make it easier for readers to visually compare the two. The tables often use combinations of yes/no variables that take time to interpret. Graphs with informative labels (the neither, open data, open code, both description used in figure 3 works well) would allow readers to get the same information more quickly. The tables could be moved to supplemental files for those who need exact values. Stacked bar charts could be used for proportions, depending on what aspect of the data the authors wish to highlight.
  + **We appreciate the reviewer taking the time to provide specific points for improvement, and have made many changes on the basis of this.**
  + **We have restructured the paper so that analysis of the 2019 group precedes analysis of the COVID-19-related group. We have removed the “Yes/No” classifications from our tables in lieu of “Open data/Open code/Neither/Both” where relevant. A stacked bar chart has been added to display the proportions of sampled 2019 pre-prints from each month containing open data and code markers.**
  + **We have brought Figures 4 and 5 together into separate panels of the same figure (i.e. the ones that were separated by two pages).**
  + **We have moved Tables 5 and 6 (which are those that contained information that is also in the graphs) to the appendix.**
* Figure 3 should be adjusted to a colorblind-accessible color palette. Noting sample sizes below the repository name would be more efficient than the note above the graph (e.g. medRxiv (n = 1,500)). A panel comparing the proportion of all preprints in each category, for each preprint server, would be helpful.
  + **The reviewer is correct. The colour palette for all figures and the total and sample counts have been moved to captions where relevant.**
  + **We have also added a table that specifies the number and proportion of all preprints in each category, by server, into the appendix**
* Higher publication rates for the 2019 dataset likely reflect a longer time since preprint posting, compared to COVID preprints posted in 2020 and 2021. This comparison is likely not particularly meaningful unless the authors were to assess publication rates for the 2019 dataset, using a length of time since posting matched to the 2020-2021 dataset. This would require data on publication dates.
  + **We removed instances of comparison between 2019 and pandemic publication rates in the manuscript. We kept analysis and figures concerning publication data (both by repository and by open data and code availability) for 2019 and pandemic pre-prints, in order to examine differences within each group as well as display publication differences between repositories for both 2019 and COVID-19-related pre-prints.**
* When discussing reasons for low rates of data depositing, the authors may wish to note that many bioRxiv and medRxiv preprints from the early months of the pandemic were re-using publically available data, as researchers had not had time to collect new data. Modeling papers predicting case rates were very common in the early months of the pandemic. These papers would not have had data to share.
  + **We have added a paragraph about this in the Results section.**
* In discussing arguments for sharing open data, the authors focus on using that data to reproduce the analysis. One of the major benefits of open data is that it can be re-used for future studies, possibly in conjunction with other datasets, to gain new insights.
  + **The reviewer is correct. We have added a sentence addressing other uses for open data in Section 4.1.**

Reviewer #2

* First--I hesitate to suggest extra work, but is it possible to form a comparison group of published articles? Alternatively, you might expand on what is now lines 50-51 on page 9, acknowledging that the published and unpublished preprints had open data and code at similar rates . . . this raises the question, did the PUBLISHED version of a particular preprint show any higher rate of open data or open code at the journal in question? Put another way, are there preprints w/o open data or code that later get published, and then b/c of the journal's policy, end up sharing data or code for the first time? Conversely, are there preprints with open data or code that get published, but then the journal website does NOT feature open data or code? I say this because it seems important to contextualize the rate of data and code sharing at preprint sites -- is the rate higher than at journals, lower than at journals, the same?
  + **The reviewer makes an excellent point about addressing changes in data and code availability between a manuscripts pre-printed and published versions. While we believe a comparison group to be out of scope for the current work, we have expanded Section 2.4 to include reference to McGuinness LA, Sheppard AL (2021) A descriptive analysis of the data availability statements accompanying medRxiv preprints and a comparison with their published counterparts. PLoS ONE 16(5): e0250887.** [**https://doi.org/10.1371/journal.pone.0250887**](https://doi.org/10.1371/journal.pone.0250887)**. This paper addresses the above concerns for medRxiv pre-prints.**
* Second--is it worth manually checking a sample of manuscripts to see how accurate the ODDPub algorithm actually is?
  + As above
* Third--sharing data from biomedical publications (particularly human subjects data) can be difficult for legal and ethical reasons. In fact, it might be good to separate out human subjects data versus lab data, mouse data, etc. In many cases, human subjects data isn't shared openly per se, but might be made available for restricted purposes at a repository like Vivli. Is it possible that the ODDPub algorithm didn't pick up on such cases as often?
  + **ODDPub algorithm defines a publication as having open data and/or code if, “The data/code was freely accessible to everyone. Data/code was not only shared upon request and no application or registration process was required.” Restricted clinical data would thus not be considered open and would not be detected in our analysis. We have provided clarity on the definition of “open” used under Section 2.2. We have also noted the restrictive nature of this definition in the last paragraph in Section 4.4.**