**Response to Referees**

**“Science and Politics of Lockdown Policies: Evidence from Brazilian States”**

We thank the editor and the reviewers for their comments, concerns, and suggestions. In this document, we detail our responses and the revisions that have been made to the paper. We hope they are satisfactory and believe that the paper is now improved thanks to your valuable feedback.

Referee comments are in **bold**. All quoted sections of the revised text that appear below are indented. The order in which we address the comments is simply the order in which they appear in the editor's correspondence.

**REFEREE 1**

**This paper begins by introducing newly developed state-level data on lockdown regulatory freedom across Brazilian states. The authors use these data to show that the severity of lockdown policies were not systematically determined by health factors, but almost only by political variables. The state share of votes for the right-wing candidate as well as if the state governor was running for reelection are the only factors that appear to affect lockdown severity. The authors conclude by noting how public choice theory is important in explaining the design of health policies.**

**I really enjoyed reading this paper. It’s first of all nice to see empirical evidence that is not simply from Europe or the US. Second, the paper is very competently written and highly interesting from both a practical and academic perspective. I think it needs a round of revisions before being ready for publication. In the following, I outline my main comments and suggestions.**

**First, there are a number of references that I think are missing. To my mind, it’s difficult not to cite Herby, Jonung and Hanke’s meta-analysis of lockdown effectiveness, which is now forthcoming in Public Choice. I would also have liked to see the authors cite Bjornskov and Voigt’s work on the topic, for example their 2022 paper in the European Journal of Law and Economics that shows that across Western countries, the extra powers the constitution allocates to the executive were a driving force behind lockdowns. Particularly, that paper finds the same as the present paper – that infections and the state of the health system was irrelevant and that the main drivers were political.**

*Response:* We thank the reviewer for the kind words and for these suggestions. These citations are clearly relevant to our paper and were shared by Reviewer 2. We were glad to include them. Our edits now read as follows (italics show the new citations):

Page 2, Paragraph 1: Numerous papers attempted to assess the effectiveness of lockdowns on contagion and other health outcomes (e.g. Hsiang et al., 2020; Fang et al., 2020; Abouk and Heydari, 2021; Courtemanche et al., 2020) as well as their impact on economic activity (e.g. Gupta et al., 2023; Fairlie, 2020; Cachanosky et al., 2021; Murphy, 2024; Redford and Dills, 2021; Bentkowska, 2021; Dingel and Neiman, 2020; Andersson and Jonung, 2024). *Herby et al. (2024) conduct a meta-analysis on the papers analyzing the effectiveness of these lockdown policies. They find that lockdown policies had a relatively small effect on Covid-19 mortality and that voluntary changes in behavior were more effective in mitigating the pandemic, an important finding given the economic costs of these measures.*

Page 2-3, Paragraph 3: *For instance, Bjørnskov and Voigt (2022) find that the main drivers of pandemic policy were political and that infection and health measures were largely irrelevant. They also find that governments across the world used emergency powers to curtail freedom of speech.* Still, most of what we know comes from the United States. McCannon and Hall (2021) analyze the political determinants of the timing of restrictions, finding that US states with less economic freedom adopted stay-at-home orders sooner than those with more economic freedom, while Miozzi and Powell (2023a) extended this finding to show that states with lower pre-existing levels of economic freedom also implemented more strict lockdown measures overall.

**A second element is that I would have liked to see a few lines or a paragraph on the state of Brazilian politics in 2020 and 2021. While it may appear confusing that right-wing popularity is associated with stricter lockdowns, the particular position of Bolsonaro is important to understand the background.**

*Response*: We appreciate the opportunity to provide greater context to our readers. We have included additional information explaining the context of Brazil. However, as we highlight in discussing our results, explaining the *direction* of the bias requires a much deeper analysis of the interactions between several actors, which we view as outside of the scope of our paper, and we encourage future research to address this question. Our edits read as follows:

Page 11, Paragraph 3: Columns (1) and (2) present the estimates for the share of votes for the right-wing candidate (and then president), Jair Bolsonaro, in the 2018 elections. The first column includes simple controls, and the second includes an additional set of controls. Bolsonaro repeatedly dismissed the impact of the pandemic in several public statements and was a critic of lockdown policies. A public choice perspective of public policy suggests that governors will implement policies that appeal to the median voters in their states. Thus, in states where more people sympathize with a candidate who criticizes lockdowns, we would expect looser restrictions. However, our findings suggest the opposite. Increased support for the right-wing candidate is a statistically and economically significant predictor of more restrictive lockdown policies. In both columns, a one standard deviation increase in the share of votes to the right is associated with 0.6 standard deviation more strict lockdown policies – or, a 13% increase in stringency relative to the mean Lockdown Regulatory Freedom.**9**

**Endnote 9:** See Table A3 in the Appendix for estimates with alternative measures.

Page 11-12, Paragraph 4: This reflects an interesting dynamic that occurred in Brazil. While Bolsonaro heavily criticized left-wing governors for their restrictive policies, his allies were able to implement relatively more stringent controls while being immune to criticisms and active legal opposition from the federal government.**10** While our focus is on documenting the existence of a policy bias, explaining the specific *direction* of the bias requires evaluating an intricate dynamic between several governmental actors. Although we consider it an important avenue of future research, we view this task as outside of the scope of this paper.

**Endnote 10:** Bolsonaro filed a Complaint of Direct Unconstitutionality (*Ação Direta de Inconstitucionalidade*) at the Supreme Court, arguing that lockdowns were equivalent to state of siege declarations, which can only be made by the president (Reuters, 2021).

**A third question is the index. I was wondering if stay-at-home orders don’t automatically imply school closures: If people are not allowed to leave their homes, they can’t go to school… I would also like to see a short discussion in section 2 about which competencies over health policy are given to the states relative to the federal level in Brazil.**

*Response:* Regarding the first part of the question, we included an explanation in a new footnote on pages 5 and 6 on the distinction between school closure and stay-at-home order policies:

**Endnote 5:** Additionally, some of these measures are arguably linked and the use of one guarantees the use of another, such as stay-at-home orders implying school closures. However, stay-at-home orders focused on limiting movement and social interactions broadly, while school closures addressed specific educational operations. Governments might issue separate directives for schools, even though it seems they could naturally align, thus we include both measures in the overall lockdown regulatory freedom score.

Regarding the second part, we included an explanation of the competencies of state and federal governments over health policies in general and during the pandemic. We also use this paragraph to justify our choice of looking at presidential-level ideology. We explain as follows in Section 2:

Pages 5-6, Paragraph 3: In Brazil, command over health policy is shared between federal, state, and local levels. Typically, the federal government, through the Ministry of Health, sets national guidelines and provides funding and technical assistance, while states are tasked with coordinating regional health policies and managing medium- and high-complexity services. Basic services are managed by local authorities. In the context of the Covid-19 pandemic, the federal government, led by President Jair Bolsonaro, minimized the threat of the virus, while state governments took more proactive stances. The latter were responsible for implementing restrictions to gatherings, business activities, and public health measures. Nevertheless, we focus on voter ideology at the presidential level as a potential source of bias because ideology at the state level is hard to infer from party affiliation, given the notoriously weak party structures in Brazil (see, e.g. Hunter, 2007; Epstein, 2009; Lucas and Samuels, 2010).

**Finally, I have two robustness tests that I would like the authors to implement. The first is the usual test that reviewers ask for in economic freedom research: To disaggregate the index and rerun the analysis with each of the three components. The second test is to run a jackknife of the central regressions in which the authors exclude each of the 27 states, one at a time, in order to ensure that the main results are not driven by a single outlier unit.**

*Response:* These are important points, and we appreciate the suggestions. We performed both tests, and report them as follows:

**4 Robustness Checks**

[…]

**4.1 Jackknife test**

Page 16, Paragraph 2: To reduce concerns that our results are not being driven by a particular outlier, we employ a jackknife sampling test. This procedure involves iteratively dropping one of the observations of our sample and re-estimating our main results (Tables 2-3). Our results are largely unchanged. In the ten specifications across the two tables, only one coefficient of interest (Table 3, Column 2), changes from significant to insignificant under the jackknife test, and no coefficient becomes significant. Results are reported in Tables A1-A2.

**REFEREE 2**

**Compulsory lockdowns are a unique feature of the response of government authorities to the corona pandemic starting in 2020. Lockdowns were implemented to varying degrees across the world, inspired by the strict lockdown policy of China. The lockdown policies were carried out without any cost-benefit calculus. It was the thing to do for governments.**

**Now, five years after the start of the pandemic, lockdown policies are being evaluated. This paper belongs to the growing literature on the political economy of the lockdown policies introduced during the corona pandemic.**

**It is an ambitious study for Brazil using data for each Brazilian state. Some of the data are constructed by the author. The aim of the paper is to identify the determinants of the degree of lockdown stringency. The basic finding is that political economy factors – not health-related indicators – are the key drivers behind the lockdown policies across Brazilian state.**

**I find this conclusion convincing, considering the pattern of lockdown policies in other countries. The econometric analysis is carried out using the latest techniques as far as I can judge. In short, it is a well-written paper that deserves publication.**

*Response:* We really appreciate the kind words. Below, we detail our response to each of your concerns.

**However, I have a few suggestions for improving the paper:**

1. **The author reviews the literature on the impact of lockdowns on health and on economic activity. Here I am missing some key contributions. First of all, the Andersson-Jonung article in *Economic Affairs* 2024. This is a study using EU as a sample finding first that there is a negative relationship between the degree of lockdowns and excess mortality, and second there is a negative relationship between the degree of lockdowns and economic outcomes like real growth. Second of all, Herby-Jonung-Hanke has a meta-analysis of the effects of lockdowns on excess mortality revealing an insignificant relationship. This paper is published in *Public Choice* fall 2024. Both these papers should be included in the introduction. Otherwise the introduction is too focused on the U.S experience. The rest of the world is also of interest.**

*Response:* We thank the reviewer for these suggestions, which are clearly relevant to our paper and were shared by Reviewer 1. Our edits now read as follows (*italics* for additions and the new citations in **bold**):

Page 2, Paragraph 1: Numerous papers attempted to assess the effectiveness of lockdowns on contagion and other health outcomes (e.g. Hsiang et al., 2020; Fang et al., 2020; Abouk and Heydari, 2021; Courtemanche et al., 2020) as well as their impact on economic activity (e.g. Gupta et al., 2023; Fairlie, 2020; Cachanosky et al., 2021; Murphy, 2024; Redford and Dills, 2021; Bentkowska, 2021; Dingel and Neiman, 2020; ***Andersson and Jonung, 2024***). ***Herby et al., 2024*** *conduct a meta-analysis on the papers analyzing the effectiveness of these lockdown policies. They find that lockdown policies had a relatively small effect on Covid-19 mortality and that voluntary changes in behavior were more effective in mitigating the pandemic, an important finding given the economic costs of these measures.*

1. **The author concludes the manuscript by summarizing his political economy interpretation. It might be of interest to have some policy conclusions as well. What are the lessons for Brazil for the next pandemic hitting the country? Who should be in charge of health policies – political elected officials or independent authorities – hopefully representing “science” as in the title of the manuscript? I am aware that this is a bit outside of the paper. But the author should at least state that this is an interesting question.**

*Response:* Please see the next point.

1. **The author presents clear political economy conclusions. That is fine in itself. But as a reader I would like to know what would have been the “best” or “most efficient” policy – optimal in the sense that the outcome would be the least damaging for the Brazilian economy/society. The author could at least consider the issue as his title suggests that “science” might lead to a different lockdown policy – different from a politically determined lockdown policy.**

*Response:* We thank the reviewer for this suggestion. As points 2-3 are quite related, we chose to offer our response for both of them together. We briefly discuss these contentions in the introduction as follows:

Page 4, Paragraph 3: *Finally, our study suggests that when optimal policy isn't feasible, federalism serves as a strong tool for policy adjustment. Multiple jurisdictions encourage experimentation, promote learning from diverse state strategies, and allow voters to move to regions aligning with their preferences and risk tolerances.*

Then, in our concluding remarks, we have added a lengthier discussion (additions in *italic*):

Page 19, Paragraph 2: *Not only in Brazil, the public opinion has tended to analyze the perils of policy biases through a dichotomy of elected politicians versus independent health officials. This incorrectly assumes that health officials are disinterested experts, who possess all the relevant information for implementing optimal policies. However, as both theoretical and empirical literature have shown, even independent health authorities face knowledge and incentive problems (Storr et al., 2021; Melo, 2023).*

Page 19, Paragraph 3: *In parallel, scholars have suggested that optimal policy should focus on targeted restrictions (e.g. Acemoglu et al., 2021). Mallapaty (2020) contends that the opportunity costs of restricting some activities for young and healthy individuals is low, these marginal opportunity costs increase as activity is restricted, because the young and healthy make up most of the workforce. Moreover, externalities of Covid-19 were overestimated because of self-mitigating factors like voluntary isolation being ignored in policy proposals (Leeson and Rouanet, 2021).*

Page 19, Paragraph 4: *Nevertheless, achieving “optimal” policy is not always politically feasible. Instead, we highlight an alternative view. Similar to the United States, we view the role of federalism as an important institutional feature of robust health policies. Multiple jurisdictions led to experimentation over, and learning from, a mix of policy strategies enacted in different states. Further, it allows marginal voters to move to jurisdictions that better align with their policy preferences and risk profiles, à la Tiebout (1956).*

Page 19-20, Paragraph 5: In conclusion, our study reveals that political economy considerations, particularly political affiliation and electoral incentives, were more critical than health-related variables in determining lockdown policies in Brazil. These findings contribute to a deeper understanding of the interplay between politics and public health during crises and highlight the need for further research into the political determinants of health policies, *and the institutional features that promote more robust policy responses*. Our work not only complements existing studies on the United States but also provides unique insights into the Brazilian context, enriching the broader discourse on the political economy of pandemic responses.

Your comment also left us thinking about our title. We chose to modify it to simply “The Politics of Lockdown Policies: Evidence from Brazilian States,” because, as you observe, our results don’t speak to it (other than highlighting its absence), and we are providing no more than broad suggestions for “the science.”

1. **Some of the** **tables can be put in a special appendix available for the interested to download.**

*Response*: We thank the reviewer for this suggestion. We kept only the main results in the main text (Tables 1-4) and moved all robustness check (formerly tables 5-6) to the appendix. The beginning of Section 4 – Robustness Checks now reads:

Page 16, Paragraph 1: In this section, we provide several robustness checks to strengthen the confidence in our findings. We briefly discuss their results here and provide the full tables in Appendix A.