

Mandatory social distancing measures in Brazil: a comparative analysis of state governments' responses to the first and second waves of the COVID-19 pandemic

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1 Introduction²

In the absence of a nationwide social distancing policy in Brazil, state governments played a central role in the adoption and enforcement of these measures. The first state to implement them was the Federal District, on 11 March 2020. In the following two weeks, all Brazilian states adopted mandatory social distancing measures, with varying degrees of strictness and effectiveness.

The decentralised implementation of social distancing measures slightly complicates the assessment of their strictness, given that states adopted different sets of rules. Yet, measuring and comparing them is critical for estimating at least three of their potential impacts: i) impacts on the dynamics of the pandemic in a given geographical area; ii) the extent to which they induced behavioural change in the population; and iii) their socioeconomic impacts.

In a previous work, I introduced the Physical Distancing Rules Index (PDI), which measures the strictness of six different types of social restrictions: i) mass gatherings and cultural, sports and religious activities; ii) non-essential commercial establishments; iii) bars, pubs, restaurants and similar enterprises; iv) schools; v) public transportation; and vi) non-essential industries (Moraes 2020c). In Moraes (ibid.) and other previous research, it is demonstrated that most Brazilian states had adopted relatively strict social distancing measures by late March 2020, although with significant variation in terms of their strictness and duration (Aquino et al. 2020; Silva et al. 2020; Moraes 2020a, 2020b, 2020c). As the number of COVID-19 cases and deaths—as well as pressure on health care systems—were relatively low in late March 2020, state governments *anticipated* a possible escalation of the pandemic in Brazil, a possibility that came into effect through what in retrospect was deemed the 'first wave' of the pandemic.

In contrast, when it became clear that many parts of Brazil were going through a second wave (since December 2020), state governments did not adopt social distancing measures with the same strictness as they had during the first wave. They tightened social distancing measures only when the number of cases and deaths, as well as the pressure on health care systems, were already high and growing. In addition, during the second wave, social distancing measures induced a behavioural change in the population, but not as strong as the one observed before and during the first wave.

Based on data presented in this Policy Research Brief, I recommend that governments consider tightening social distancing measures and adopting clear and objective criteria to guide decisions on whether to tighten or ease them.

2 Social distancing measures: a comparative analysis of Brazil's state government policies during the first and second waves of the pandemic

During the second half of March 2020, state governments adopted relatively strict social distancing measures in anticipation of the first wave of the pandemic in Brazil. Around two weeks after their implementation, however, these measures started being relaxed in a few states. Yet, in most states, this occurred progressively and in response to decreasing numbers of new cases and deaths. The easing of social distancing measures was also accompanied by other preventive policies, especially the mandatory use of masks, social distancing rules in shops, public transportation and other places, and various other rules in public and private venues.

Measures were continually relaxed until early October 2020, after which governments maintained the restrictions adopted until then. In late October 2020, these measures consisted mainly in the prohibition of mass gatherings, full or partial suspension of in-person classes, and rules for various types of shops and other establishments (for example, restaurants could operate at no more than 50

per cent capacity). Data on the strictness of social distancing measures are presented in Figure 1, which compares the stringency of social distancing measures (measured by the PDI, on a scale of 0 to 10) against the number of new deaths (per million people).

Data shows that when the number of cases started increasing in December 2020, state governments did not impose stricter social distancing measures. Figure 1 indicates that social distancing measures were made stricter in the late February 2021, around three months after the number of new deaths started rising consistently. Strict measures were broadly adopted only in early March 2021, when the number of new cases and deaths had already reached significantly high levels and kept growing. Furthermore, despite the second wave's greater severity, social distancing measures were less strict than those adopted before and during most of the first wave of the pandemic.

As demonstrated in Figure 2, this occurred in most states. Strict measures were only adopted—in most cases—after the second wave had already hit. In addition, the severity of the second wave in Amazonas in January 2021 did not prompt other states to adopt additional preventive social distancing measures.

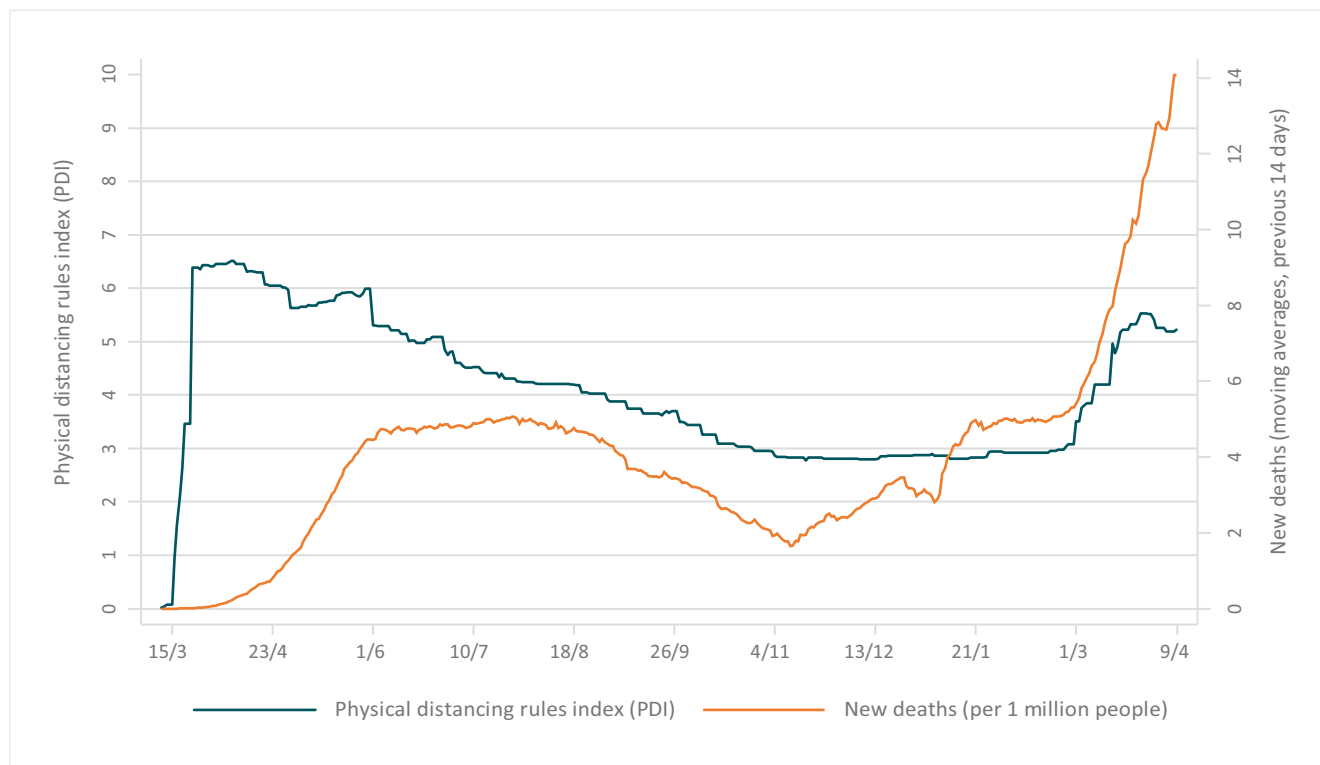
Thus, while all state governments adopted social distancing measures **preventively** before and during the first wave of the pandemic, most acted **reactively** when faced with the second wave. Figure 2 indicates that most states that tightened social distancing measures during the second wave did so only several

days after its onset. A few of the exceptions were Acre, Ceará and Espírito Santo, which reacted relatively quickly, although measures were not always as strict as those adopted during the first wave. Other states opted *not* to tighten measures substantially—or even relaxed them—such as Mato Grosso, Rondônia and Tocantins, even though the number of deaths was rising rapidly.

Table 1 compares the strictness of social distancing measures in April 2020 and March 2021. Data demonstrates that the strictness of social distancing measures was 25 per cent lower in March 2021 when aggregate data for Brazil is considered. Measures were less strict in March 2021 in 22 of the 27 Brazilian states, even if the number of deaths was significantly higher across all states and 11 times higher for Brazil as a whole.

In addition to their late adoption, mandatory social distancing measures during the second wave induced a behavioural change, although slightly weaker than that the one observed in March-April 2020. Data are presented in Figure 3, comparing the strictness of mandatory social distancing measures and levels of social distancing, the latter using data from Google Mobility (retail and recreation) as a proxy. Although people responded to tighter social distancing measures, levels of social distancing were lower than those observed in March-April 2020. Therefore, both mandatory social distancing measures and levels of social distancing were below those observed before and during most of the first wave of the pandemic. Levels of social distancing in March 2021 were around 30 per cent lower than in April 2020, even if the pandemic was significantly more severe during the second wave.

FIGURE 1
PDI and number of new deaths (per million people) due to COVID-19 (11 March 2020 to 9 April 2021)

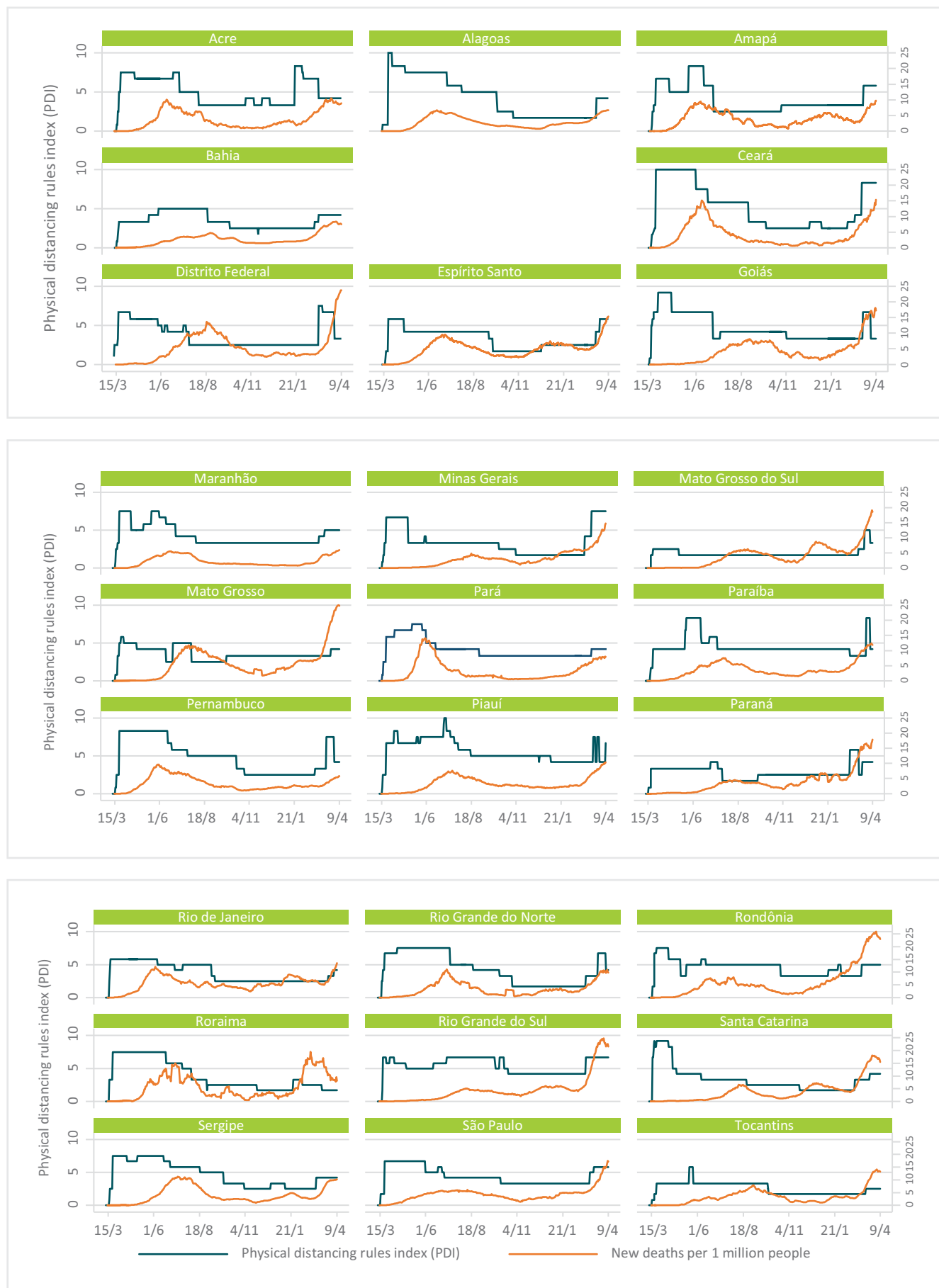


Notes: (i) The PDI is being weighted by the states' population and it has a scale of 0 to 10 (where 10 indicates the strictest social distancing measures). (ii) Moving averages (previous 14 days) for the number of new deaths.

Source: Author's elaboration.

FIGURE 2

PDI and number of new deaths due to COVID-19 by Brazilian state (11 March 2020 to 9 April 2021)



Notes: (i) Figures for new deaths are from Brazil's Ministry of Health and refer to deaths reported on that day. (ii) Data for Amazonas are not presented here due to its substantially higher number of new deaths, which would hinder the visualisation of the data for the other states.

Source: Author's elaboration.

TABLE 1

PDI and number of deaths, April 2020 and March 2021

	PDI (0-10, simple averages)			Number of deaths	
	April 2020	March 2021	Variation: April 2020 – March 2021 (%)	1 to 30 April 2020	1 to 30 March 2021
Acre	7.1	4.2	-41%	19	255
Alagoas	8.1	2.7	-66%	46	534
Amazonas	7.5	4.9	-34%	422	1,137
Amapá	5.8	4.5	-24%	34	152
Bahia	3.3	4.2	+25%	102	3,351
Ceará	10	6.4	-36%	475	2,494
Distrito Federal	6.1	6.5	+8%	27	1,074
Espírito Santo	5.2	3.6	-31%	83	1,031
Goiás	8.2	4.8	-41%	28	2,927
Maranhão	6.0	4.5	-25%	183	979
Minas Gerais	6.6	5.8	-11%	80	5,350
Mato Grosso do Sul	2.5	2.6	+4%	8	901
Mato Grosso	4.8	3.5	-26%	11	1,728
Pará	6.5	3.8	-42%	208	1,784
Paraíba	4.2	3.8	-8%	62	1,175
Pernambuco	8.3	5.2	-37%	559	1,122
Piauí	7.1	5.0	-29%	20	731
Paraná	3.3	4.7	+40%	80	4,852
Rio de Janeiro	5.8	2.7	-54%	831	3,352
Rio Grande do Norte	7.1	4.4	-38%	55	889
Rondônia	6.5	4.6	-29%	15	1,235
Roraima	7.5	2.0	-73%	7	220
Rio Grande do Sul	6.0	6.7	+11%	47	7,040
Santa Catarina	7.3	3.6	-51%	44	3,394
Sergipe	7.1	4.0	-44%	12	517
São Paulo	6.7	5.1	-24%	2,239	13,999
Tocantins	3.3	2.1	-36%	3	481
Brazil	6.3	4.7	-25%	5,700	62,704

Note: Figures for new deaths are from the Ministry of Health and are based on the notification date.

Source: Author's elaboration.

Similar patterns are observed when Google Mobility data for parks, transit stations, workplaces, and residential areas are used, as presented in Figure 4.

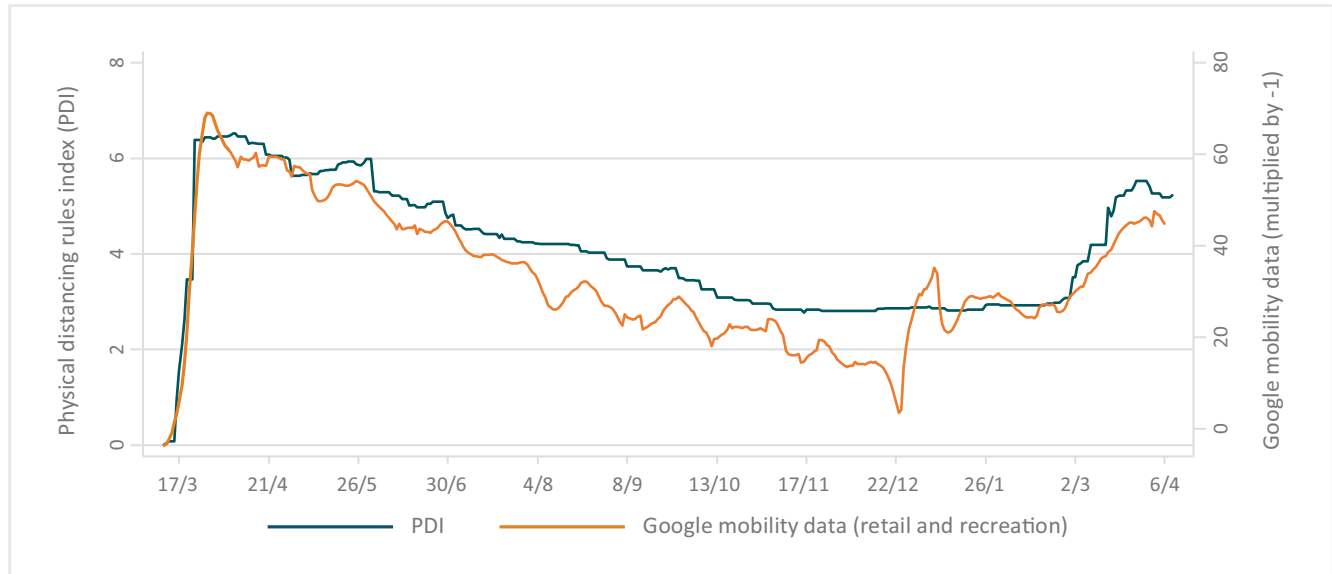
A similar pattern is observed for most states, as presented in Figure 5. During the second wave of the pandemic, levels of social distancing similar to those observed in March-April 2020 occurred only in Amazonas; and even there they were achieved late and after a period of very low social distancing levels in November-December 2020. From 1 to 24 December 2020, Amazonas had the lowest social distancing levels in Brazil: 16 per cent above the base value. In comparison, levels during

the same period were of -16 per cent in Rio de Janeiro and -17 per cent in Bahia. This probably contributed to the rapid spread of the virus in Amazonas and the collapse of the state's health care system in January 2021.

However, even in states that adopted stricter social distancing measures during the second wave (Acre, Distrito Federal, Mato Grosso do Sul and Minas Gerais, for example), social distancing levels were lower than those achieved during the first wave. This indicates that stricter measures would have been necessary to reach social distancing levels similar to those observed during the first wave.

FIGURE 3

PDI and levels of social distancing (11 March 2020 to 6 April 2021)

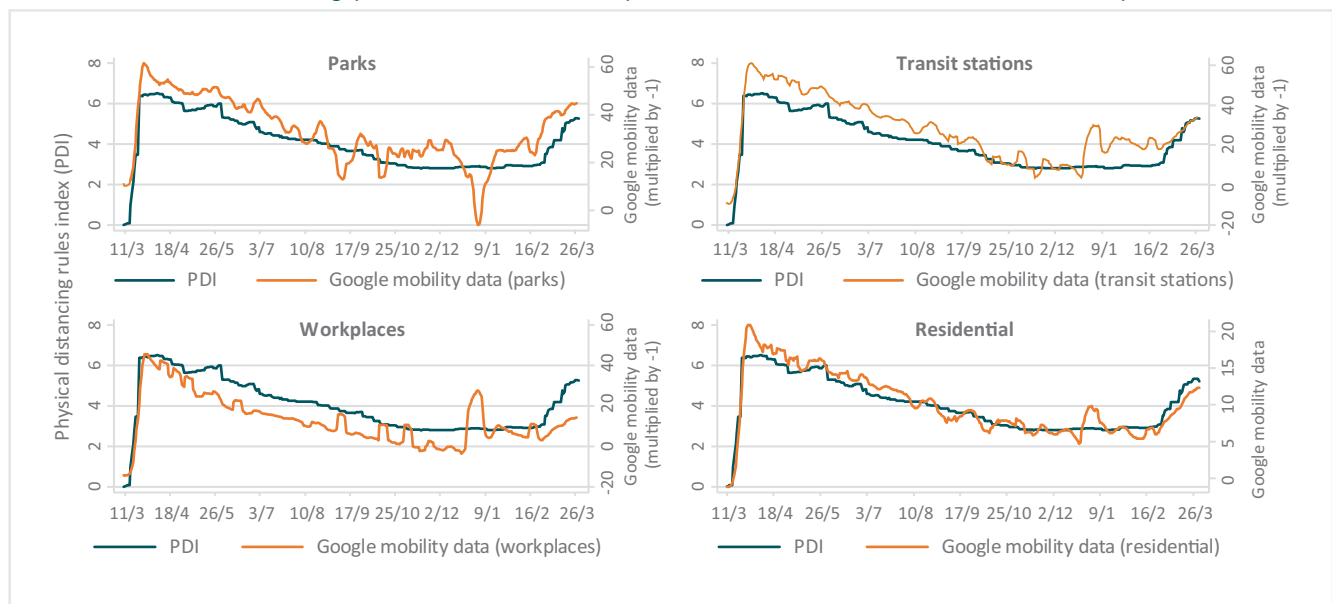


Notes: (i) The PDI is being weighted by the states' population and it has a scale of 0 to 10 (where 10 indicates the strictest social distancing measures). (ii) Data on social distancing are from Google Mobility (retail and recreation), which measures the variation in the mobility of people from a base value, which in this case is the average (for each day of the week) of mobility between 3 January 2020 and 6 February 2020. Values were multiplied by -1 to facilitate visualisation and comparison against the PDI values. For example, a value of '70' in the secondary axis indicates a decrease of 70 per cent in mobility relative to the base value. (iii) Moving averages (previous seven days) for data on levels of social distancing.

Source: Author's elaboration.

FIGURE 4

PDI and levels of social distancing: parks, transit stations, workplaces and residential areas (11 March 2020 to 6 April 2021)



Notes: (i) The PDI is being weighted by the states' population and it has a scale of 0 to 10 (where 10 indicates the strictest social distancing measures). (ii) Data on social distancing are from Google Mobility, which measures the variation in the mobility of people from a base value, which in this case is the average (for each day of the week) of mobility between 3 January 2020 and 6 February 2020. Values were multiplied by -1 (except for "residential" areas) to facilitate visualisation and comparison against the PDI values. For example, a value of '70' in the secondary axis indicates a decrease of 70 per cent in mobility relative to the base value. For residential areas, a value of '20' in the secondary axis indicates an increase of 20 per cent in the mobility in relation to the base value (which is an expected consequence of suspending social, economic and cultural activities). Also, the scale of data for residential areas is different from those for the other variables. (iii) Moving averages (previous seven days) for data on levels of social distancing.

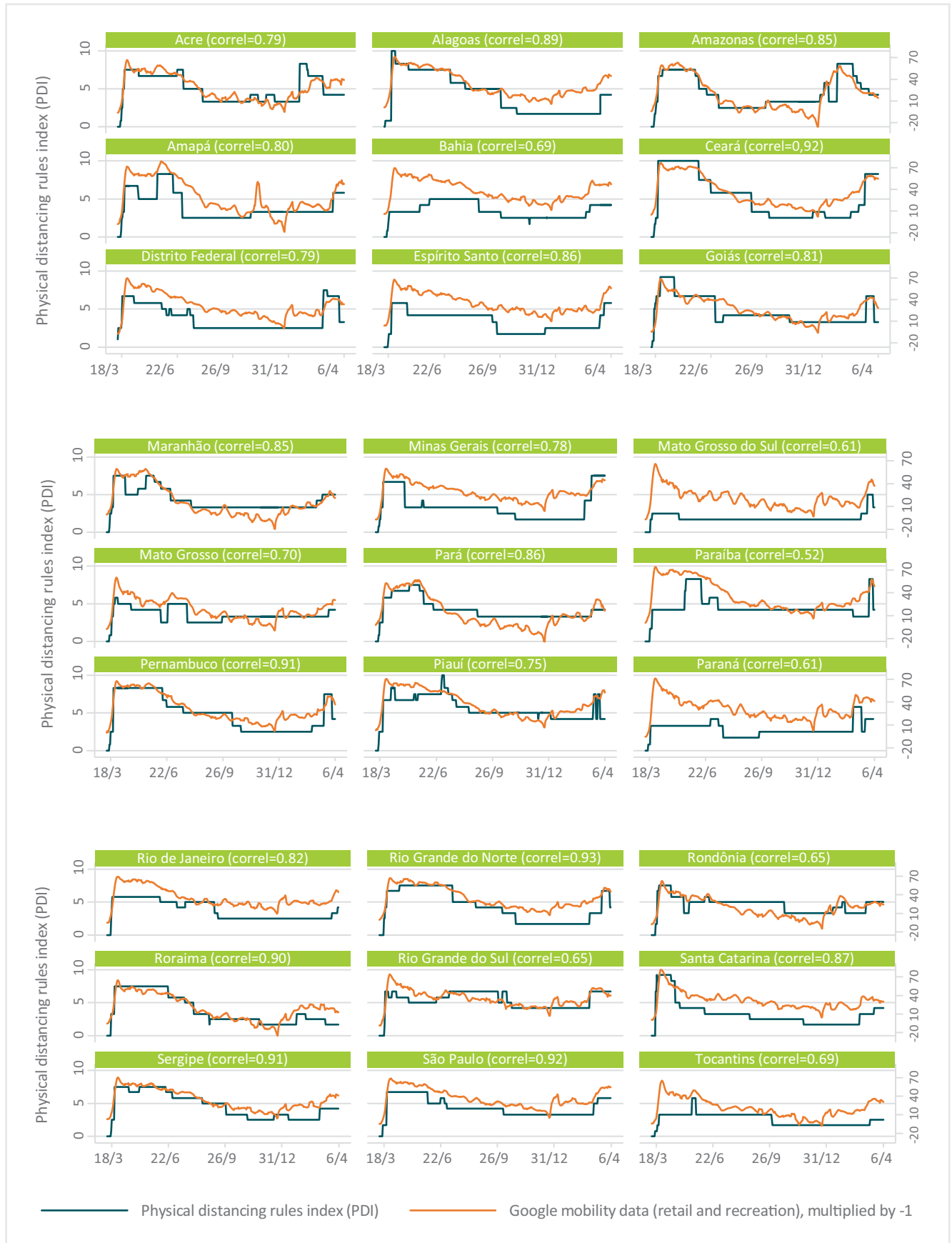
Source: Author's elaboration.

Data presented in Figure 5 indicate that people responded to stricter (and less strict) mandatory social distancing measures, which is suggested by the high correlation between these two variables (equal to or higher than 0.7 in 21 states). However, both social distancing rules and levels of social distancing during the second wave of the pandemic remained below those

observed during the first wave in most states. Although lower levels of social distancing could theoretically be compensated by the widespread use of face masks or stricter social distancing rules in shops and other venues, the severity of the second wave indicates that governments should have adopted additional mandatory social distancing measures.

FIGURE 5

PDI and social distancing levels: 11 March 2020 to 31 March 2021



Notes: (i) Data on social distancing are from Google Mobility, which measures the variation in the mobility of people from a base value, which in this case is the average (for each day of the week) of mobility between 3 January 2020 and 6 February 2020. Values were multiplied by -1 to facilitate visualisation and comparison against PDI values. For example, a value of '70' in the secondary axis indicates a decrease of 70 per cent in mobility relative to the base value. (ii) Moving averages for data on levels of social distancing (previous seven days). (iii) Correlations are between the PDI values in a given day and the moving average of social distancing levels (previous seven days).

Source: Author's elaboration.

3 Conclusions and recommendations

In contrast to what was observed before and during the first wave of the COVID-19 pandemic, stricter mandatory social distancing measures during the second wave were introduced in most Brazilian states only after several days since the onset of the second wave, and, in some cases, not even then. In other words, governments were mostly *reactive* when faced with the second wave, different from their preventive behaviour exhibited before and during the first wave. This decision-making pattern also indicates that governments often adopted strict social distancing measures as a 'last resort', implementing them only when health systems were collapsing and no additional short-term options to improve the situation were available.

Furthermore, due to previous long periods of social isolation, it is likely that people experienced 'pandemic fatigue'. This probably reduced their willingness to adhere to social distancing rules, even if the pandemic was significantly more severe during the second wave. Based on the data presented in this brief, I recommend the following:

- Governments should adopt stricter social distancing measures when the number of new cases and deaths rise persistently or remain at high levels. This is due both to

the severity of the pandemic's second wave and less willingness by part of the population to adopt voluntary social distancing. Therefore, strict social distancing measures are necessary to reach high social distancing levels.

- Governments that have not yet adopted structured social distancing plans should urgently do so. These plans must have clear, objective, transparent and comprehensive criteria for tightening or relaxing social distancing measures—as already observed in the cases of Espírito Santo, Rio Grande do Sul and São Paulo, for example. The existence of these plans reduces the influence of pressures against strict social distancing measures. A further discussion on the importance of these plans can be found in Moraes, Silva and Toscano (2020).

1. The author would like to thank Thaís dos Santos Marques for her support in collecting data on social distancing levels. This Policy Research Brief is an updated version of a Technical Note published by Ipea (Moraes 2021).

2. The dataset used in this Policy Research Brief is updated periodically and is available at: <<http://tinyurl.com/ipeacoronavirus>> and <<https://medidas-covidbr-iptsp.shinyapps.io/painel>>.

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