Covid-19: Public Policies and Society's Responses

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Quality information for refining public policies and saving lives

Policy Briefing Note 9
Covid-19 ICU beds: Shortcomings, inconsistencies, and disparities in federal and state government data impair the assessment and evaluation of policies

ICU beds are essential for saving lives during the pandemic. Accurate information on their amount and occupancy rate is vital for defining public policies against the new coronavirus, such as the expansion of hospital units as well as social distancing measures and their potential easing. Occupancy rates of Covid-19 ICU beds represent the final link for assessing the risk of a potential collapse of the health system for patients with severe symptoms requiring hospitalization. In other words, these indicator permit socitety to identify the capacity of the health care network to preserve the lives of critical patients.

The Solidarity Research Network conducted an exhaustive and thorough survey of the ICU data officially reported by of the Ministry of Health (MH) and by all 26 state health departments, as well as the Federal District. The information collected regarding the amount Covid-19 ICU beds, both available and occupied, reveals enormous flaws and disparities. This lack of transparency hinders an accurate assessment of the capacity of the health system and the feasibility of easing social distancing measures.

Main conclusions

1. There is no clear information as to the amount of available Covid-19 ICU beds in the national territory. There are enormous disparities in the data provided among official sources. For example, the differences are in order of magnitude of sometimes reach 200% when we compare the data reported in the Covid-19 Platform against the National Registry of Health Facilities for the month of May 2020;

2. Two Brazilian states, Rio de Janeiro and Tocantins, did not provide any information on the number of Covid-19 ICU beds in their platforms, with Rio de Janeiro ranking among the top 5 Brazilian states with the highest death rate from the new coronavirus so far;
3. Only 5 states provide the number of Covid-19 ICU beds in the public health system[1] as well as in the private system: Alagoas, Ceará, Distrito Federal, Espírito Santo, and Sergipe;
4. Only 7 states provide the real-time occupancy rate of Covid-19 ICU beds in the public health system across all units managed by the health secretariats of state governments: Alagoas, Ceará, Distrito Federal, Espírito Santo, Goiás, Santa Catarina, and Sergipe;
5. States considered epicenters of the pandemic in Brazil, such as Amazonas and São Paulo, lack information about Covid-19 ICU beds. The Amazonas platform provides only the number of occupied beds, which does not allow us to estimate the occupancy rate. São Paulo provides only the occupancy rate of Covid-19 ICU beds without differentiating between the SUS and the private network;
6. Different arrangements have been adopted by public managers to increase the number of ICU beds during the pandemic, such as increasing the amount of beds contracted from private hospitals and health networks as well as the creation of field hospitals, with the acquisition of new equipment and materials. Given the scarce data currently available from official government sources, we are unable to verify which actions were taken by state governments, nor the cost and effectiveness of these acquisitions;
7. The generalized inconsistency of the data on ICUs suggests that the synergies between the public and private health systems are not being fully explored. Furthermore, they raise significant doubts as to the efficiency of the currently implemented policies.
8. If governments are using the information disclosed to the public for decision-making, then we must be alert to the severe mismatch between the data, the estimates of the neccessary capacity needed to care for patients in acute conditions, and the ongoing plans for easing social distancing measures.
9. If the data provided is not sufficiently robust to justify the loosening of containment policies, the population is being advised to follow decisions based on unknown sources of information or known only to governments. In both alternatives, the population's understanding, judgment, and adherence are impaired.
10. The lack of information provided to the general public is severely damaging, with negative implications for the health care of both those contaminated by Covid-19 and the continuity of neccessary treatment for those suffering from other diseases.

Introduction

The Solidary Research Network (https://redepesearcholidaria.org/) analyzed the information regarding the availability, access, and occupancy of ICU beds in Brazilian states, considering: (i) the availability of ICU beds prior to the Covid-19 pandemic ; (ii) additional demand due to critically ill patients infected with the new coronavirus; and (iii) the acquisition and reporting of ICU beds by public managers since March 1, 2020 until the present.

An evaluation of ICU beds in the period prior to the new coronavirus pandemic shows that there is an uneven regional distribution[2]. In the SUS, 72% of the country's health regions did not have the minimum desirable amount of ICU beds in January 2020 (10 beds per 100 thousand inhabitants[3]), and 15% of the

1 Translator's note: Brazil's Unified Health System, known by the acronym SUS or *Sistema Único de Saúde*, is the publicly funded health care system in the country. The system is entirely free at the point of service for any person.
2 Portela, M.C.; Pereira, C.C.A.; Andrade, C.L.T., Lima, S.L.M.; Braga Neto, F.C.; Soares, F.R.G.; Martins, M. *Health regions and the installed capacity of ICU beds and equipment for coping with severe cases of Covid-19.* Technical Note n. 2. Rio de Janeiro: ENSP/Fiocruz, 2020.
3 Costa, N.R. *Availability of ICU Beds in the SUS and in Private Health Plans During the Covid-19 Epidemic in Brazil.* 2020. http://www.ensp.fiocruz.br/portal-ensp/informe/site/arquivos/anexos/ a92729d3eae11d7fe26e4f4bd9a663c16f13a410.PDF

population served by the SUS lacked any access to ICUs, especially in the North, Northeast, and Center-West regions (RACHE et al, 2020). Access to private health services is also uneven regarding availability of ICU beds. The private health network has more hospitals than the SUS, and the more urbanized areas of the country concentrate most of these hospital resources, especially in the Southeast and South[4].

Mismatched data on Covid-19 ICU beds from the Ministry of Health (MH)

There are two sources of data in the MH regarding the number of confirmed cases of Covid-19: (i) the Strategic Management Support Room (SAGE in the Portuguese acronym) and (ii) the Covid-19 Platform. For the number of Covid-19 ICU beds in the country, we used the National Registry of Health Facilities (CNES in the Portuguese acronym) and the Medical Supplies Dashboard found in the Covid-19 Platform of the MH.

Table 1 compares the data provided by the online platforms maintained by the MH regarding the number of confirmed cases and deaths by Covid-19 in Brazil and the number of Covid-19 and non-Covid-19 ICU beds.

In an inquiry on May 12, we found a difference of almost one thousand cases of contamination and 19 deaths in the data provided by the Coronavirus Dashboard of the MH compared to the data from the Strategic Management Support Room (SAGE), also belonging to the MH. In an inquiry performed on June 2, illustrated in Table 1, the difference is almost 25 thousand more contamination cases and circa one thousand fewer deaths, according to the Coronavirus Dashboard compared to data from the SAGE. We also identified a difference of over 200% between the value recorded in the Covid-19 Bed and Medical Supplies Dashboard and the National Registry of Health Facilities (CNES in the Portuguese acronym), also maintained by the MH, regarding the number of ICU beds intended for Covid-19 patients. In order to exclude the hypothesis that the Medical Supplies Dashboard could be showing the total number of ICU beds, we added the value corresponding to all types of ICU beds found on the CNES platform, including those intended for Covid-19, and verified that the values referring to the total amount of available ICU beds in the country does not match the value provided by the Covid-19 Beds and Medical Supplies Dashboard. Table 1 reports the incongruencies by official federal government data source..

Table 1 – Covid-19 infections and deaths, amount of Covid-19 ICU beds, and total amount of ICU beds

Source	N° of cases	N° of deaths
Coronavirus dashboard of the MH[1]	555.383	28.936
Strategic Management Support Room - SAGE[2]	526.447	29.937
	COVID-19 ICU Beds for Adults	ICU COVID-19 Pediatric Beds
Dashbord of COVID-19 ICU Beds and Supplies from the MH[3]	34.203	115
National Registry of Health Facilities (CNES)	14.255	710
	Total Adult ICU Beds *	Total Pediatric ICU Beds**
National Registry of Health Facilities (CNES)	47.086	14.746

*Aggregating all adult ICU beds including for burn and coronary disease patients.
** including pediatric and neonatal beds. Sources: Covid-19 Beds and Medical Supplies Dashboard[3] according to the different data sources of the MH. Inquiries performed on 06.02.2020

4 Rache, B.; Rocha, R.; Nunes, L.; Spinola, P.; Malik, A.M.; Massuda, *A. Infrastructure Needs in the SUS for preparing for Covid-19: ICU Beds, Respirators, and Hospital Occupancy Rates*. Technical Note n. 3 - Institute for Health Policy Studies (IEPS). March, 2020.

Quality of State-Level Data

In the data presented in Table 2, a score of **0** refers to the state in which the State Health Secretariat (SHS) did not provide any information regarding the number of Covid-19 ICU beds. A score of **5** indicates the amount of available and occupied Covid-19 ICU beds, both in the SUS and the private health system. Appendix 1, at the end of this note, shows the code assigned for each state as well as the analyzed platforms and dashboards.

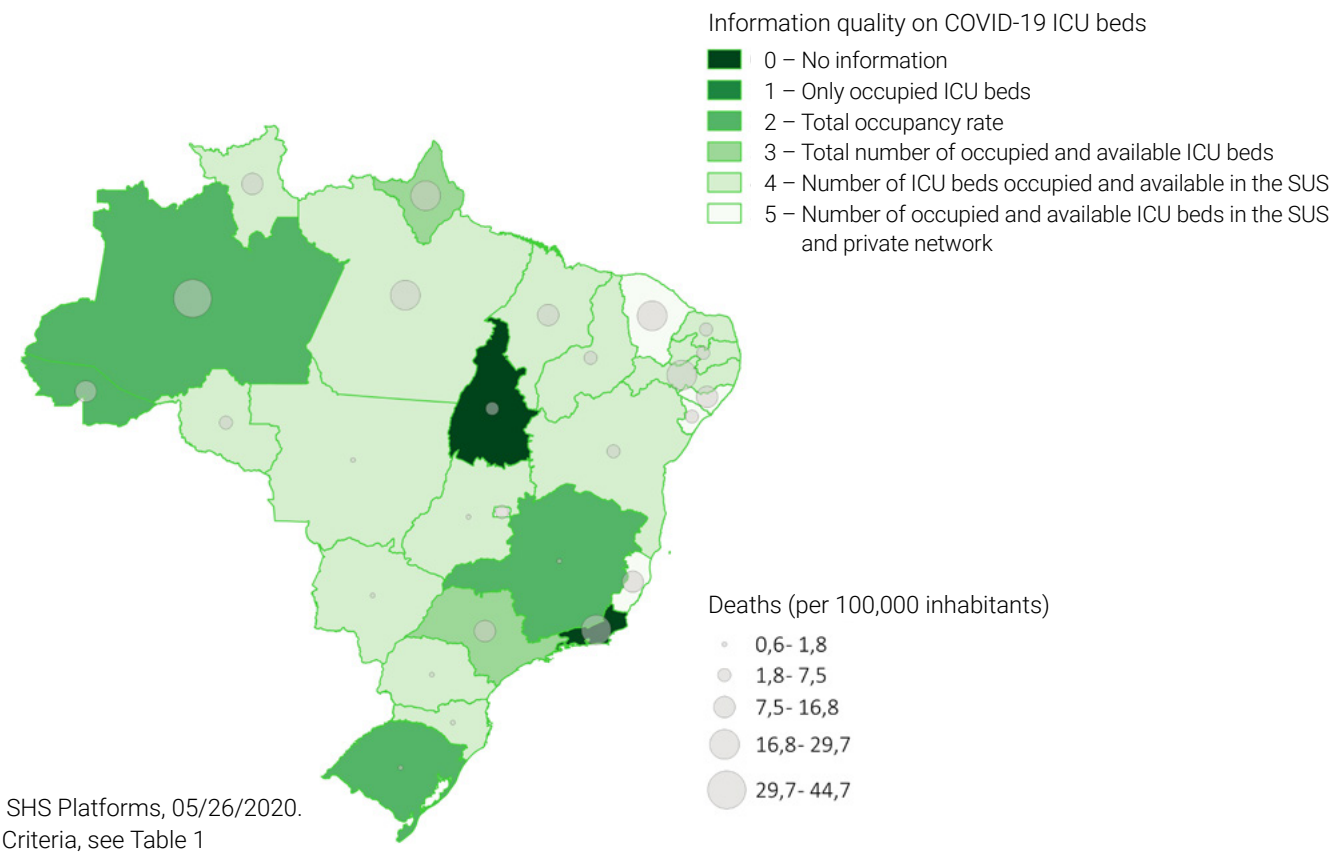
Table 2 - Criteria and classification for the information quality about Covid-19 ICU beds

Criteria for the information quality about Covid-19 ICU beds	Classification
Does not provide any information about Covid-19 ICU beds.	0
Provides only the amount of occupied Covid-19 ICU beds or only the amount of available Covid-19 ICU beds.	1
Provides the occupancy rate of Covid-19 ICU beds, but does not provide the amount of occupied and available beds.	2
Provides the amount of occupied and available Covid-19 ICU beds, but does not differentiate to which system the beds belong to, that is, it adds up the ICU beds both in the SUS and in the private health system.	3
Provides the amount of occupied and available Covid-19 ICU beds only in the SUS.	4
Separately provides the amount of occupied Covid-19 ICU beds and the amount of available Covid-19 ICU beds in the SUS and private networks.	5

Source: State Health Secretariats. May 2020

Figure 1 represents the application of these criteria to the states based on data from the SHSs.

Figure 1 - Distribution of the information quality index about Covid-19 ICU beds across the states



Source: SHS Platforms, 05/26/2020.
For the Criteria, see Table 1

The diversity registered in Figure 1 suggests that:

- Among the 27 states, 20 (74%) had official platforms that made it possible to estimate the occupancy rate of Covid-19 ICU beds;
- The states of Rio de Janeiro and Tocantins did not provide any information regarding the amount of Covid-19 ICU beds in their official platforms;
- 70% of the SHSs provided the number of Covid-19 ICU beds available and occupied in the SUS in their respective state, allowing for an estimation and monitoring of the occupancy rate of Covid-19 ICU beds created and maintained by the SUS, as well as those contracted by the SHSs;
- Only 19% of states (Alagoas, Ceará, Distrito Federal, Espírito Santo, and Sergipe) differentiated the Covid-19 ICU beds between those belonging to the public and private sectors;
- Only 7 states provided the occupancy rate of the Covid-19 ICU beds in all units of the SHSs, thus allowing for real-time access to the occupancy rate of all hospitals with Covid-19 ICU beds in the SUS (Alagoas, Ceará, Distrito Federal, Espírito Santo, Goiás, Santa Catarina, and Sergipe).

Lack or inaccuracy of data is not a result of the economic power of the states nor the severity of the crisis

Figure 2 compares the death rate attributed to the coronavirus (per 100 thousand inhabitants) and the GDP of each state in 2017, according to the IBGE. The analysis shows that there is no relationship between the lack of information in the platforms updated by the various SHSs and the high death rates, as seen in the state of Rio de Janeiro, the fourth state with the highest Covid-19 death rate in 05/28.

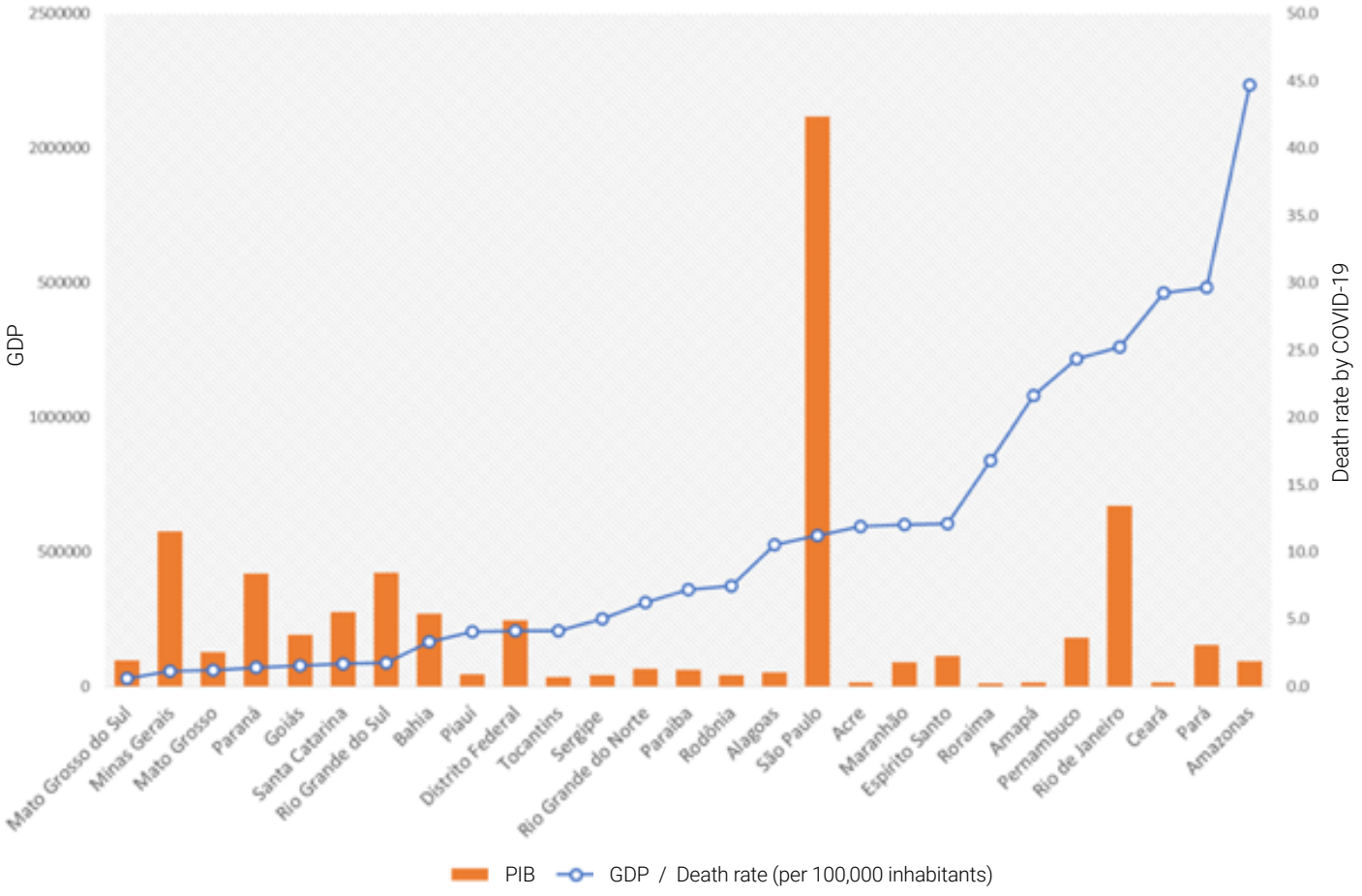


Figure 2 - Gross Domestic Product (GDP, according to the IBGE in R$1,000,000, 2017) and the Covid-19 death rate (per 100,000 inhabitants.) on 05/28/2020 in Brazilian states according to epidemiological platforms and bulletins maintained by the SHS.

Figure 2 also allows us to infer that there is no relationship between the lack of information and the scarcity of financial and human resources, as verified by the classification of the state of São Paulo, the state with the highest GDP in the country, which presents only the occupancy rates of Covid-19 ICU beds, but does not differentiate between private beds and those under the state government management, nor does this state report the amount of available and occupied beds.

Shortcomings and discrepancies in São Paulo

The data provided by the state of São Paulo regarding Covid-19 ICU beds are consolidated by the SEADE Foundation (https://www.seade.gov.br/coronavirus/), which updates daily the occupancy rate of these beds for all 18 health regions in the state. While it is certainly beneficial to have the occupancy rate of Covid-19 ICU beds for all health regions in the state, in addition to the state's general occupancy rate, the information is not disaggregated according to the health management system, i.e., it does not inform whether these beds are in the SUS or private networks and hospitals. This means that we cannot evaluate whether the population of São Paulo without access to the private health system has guaranteed access to beds in the public health network, or whether these hospitals are already at full capacity.

Information regarding the origin and management of Covid-19 ICU beds is especially important. According to the National Registry of Health Facilities (CNES) of the MH, in April 2020 the state of São Paulo had 3,382 Covid-19 ICU beds, whereas only 32% were managed by the SUS, as shown in Table 3. The same table contains the proportion of Covid-19 ICU beds under SUS management and non-SUS beds in the city of São Paulo. The city has a higher proportion of Covid-19 ICU beds in the SUS when compared to the state (41%). The table also shows the proportion of the population of the state and city of São Paulo dependent exclusively on SUS services, that is, the population without access to private health plans. Thus, we find a larger share of the population in the state of São Paulo dependent on the public health service when compared to the city of São Paulo. However, the population of the state, proportionally, has less availability of ICU beds in the SUS (CNES, 2020).

Table 3 – SUS and non-SUS Covid-19 ICU beds. Proportion of SUS-dependent population in the state and city of São Paulo

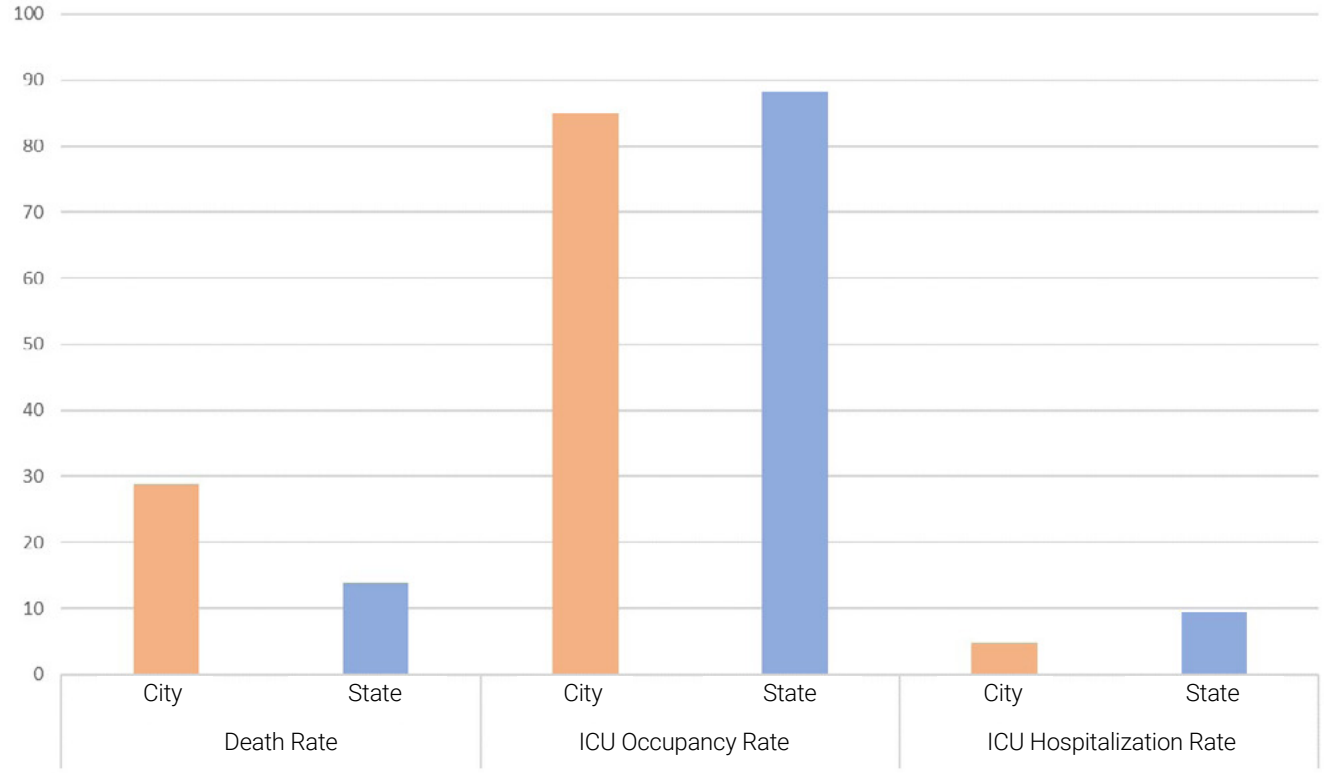
	ICU COVID-19 Non-SUS	ICU COVID-19 SUS	SUS-dependent Population
State of São Paulo	2292 (68%)	1090 (32%)	61.6
City of São Paulo	729 (59%)	510 (41%)	51.8

Source: CNES/MH, 2020.

The comparison between Covid-19 ICU beds in the state of São Paulo and in the city of São Paulo reveals differences in the information provided by the state and city health departments. Unlike the state, the city health department of São Paulo provides information regarding the number of occupied and vacant Covid-19 ICU beds as well as the occupancy rate. Conversely, the state provides only the occupancy rate of Covid-19 ICU beds without differentiating between beds under state government management and the amount of existing and occupied beds.

The lack of accurate information regarding the occupancy rates of Covid-19 ICU beds can also be found in the high death rates by Covid-19 in the state and municipality of São Paulo in the month of May. The Covid-19 death rate in the state increased significantly during the month of May, as shown in Figure 3, although this growth was less intense than in the city of São Paulo, which had an average daily growth rate of 0.7 deaths against 0.4 in the state during the same period (May 2020).

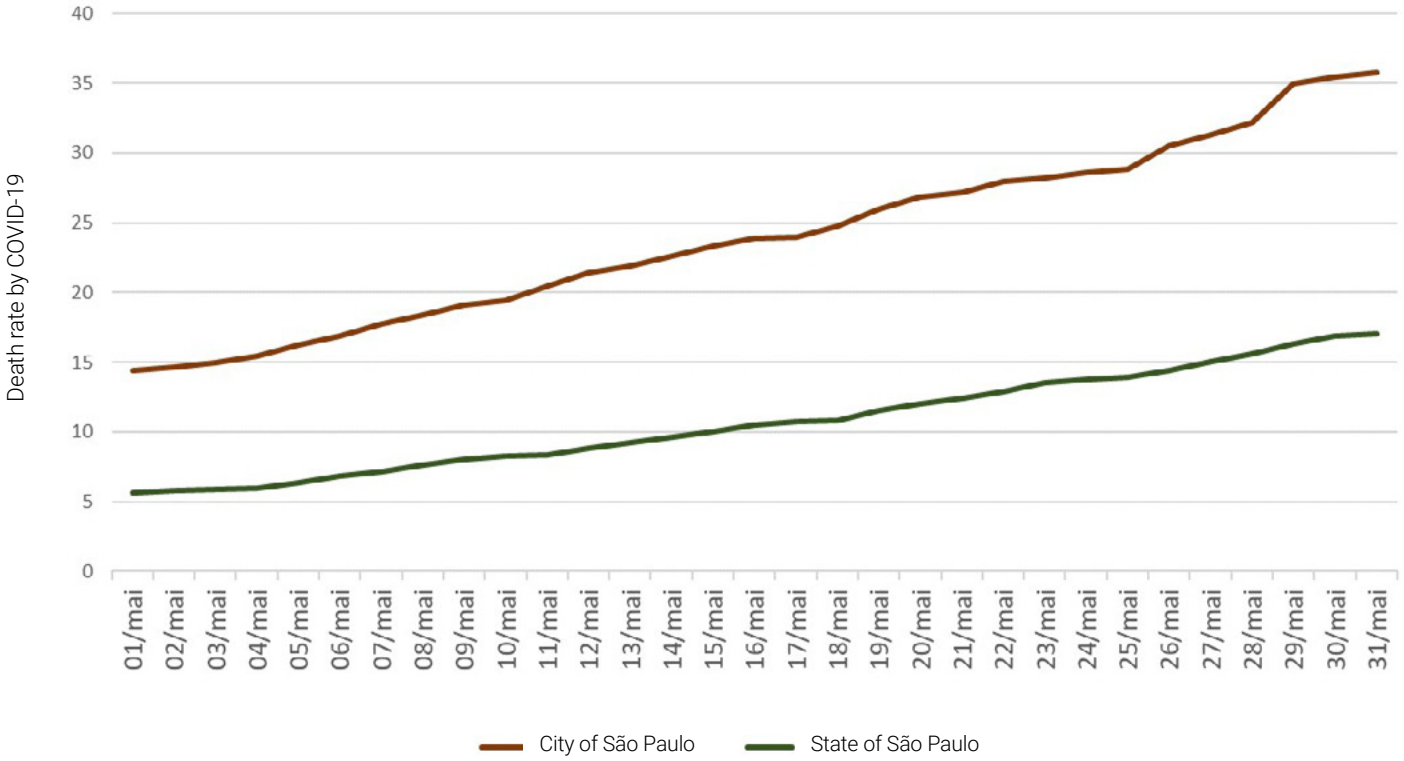
Figure 4 – Covid-19 death rate (per 100,000 inhabitants) during the month of May 2020 in the city of São Paulo (in red) and in the state of São Paulo (in blue)



Source: CHS-SP and SHS-SP

Although the death rate in the city of São Paulo was higher in May, when compared to the state, the same did not happen with the occupancy rate of Covid-19 ICU beds and the rate of Covid-19 inpatients in the ICU, as the highest occupancy and hospitalization rates were in the state, as illustrated in Figure 4.

Figure 5 – Death rate, ICU bed occupancy rate, and hospitalization rate for Covid-19 in the city of São Paulo, in red, and in the state of São Paulo, in blue.



Source: CHS-SP e SHS-SP

Conclusions

Data inconsistency and mismatch make it difficult for society to prepare, implement, and evaluate public policies. This situation becomes even more serious when the world and Brazil face one of the most lethal viruses of the past 100 years, which challenges the vast scientific and technological progress at the expense human health.

Based on official government sources, Brazilian society lacks the necessary conditions to fully evaluate the measures being adopted by public authorities and managers, such as social distancing measures and the different stages of their easing. Furthermore, due to inconsistent and disparate data, the population is unable to grasp the importance and benefit of public policies. In addition to the lack of coordination between the federal government, states, and municipalities, we also identify some of the reasons that explain the delay and unevenness in the decision-making processes, as well as the low compliance of the population to many official determinations.

Without reliable data and transparent systems, quality public policies are unlikely to take shape.

Appendix 1

Classification of the information quality about Covid-19 ICU beds and analyzed platforms and dashboards in Brazilian states.

State	Classification	Analyzed Platforms and Dashboards
AL	5	https://agencia.ac.gov.br/agencia-de-informacoes-sobre-coronavirus/
CE	5	https://indicadores.integrasus.saude.ce.gov.br/indicadores/indicadores-coronavirus/coronavirus-ceara https://indicadores.integrasus.saude.ce.gov.br/indicadores/indicadores-coronavirus/historico-internacoes-covid
DF	5	https://covid19.ssp.df.gov.br/extensions/covid19/covid19.html#/ https://salasit.saude.df.gov.br/
ES	5	https://coronavirus.es.gov.br/painel-covid-19-eshttps://coronavirus.es.gov.br/leitos-uti
SE	5	https://todoscontraocorona.net.br/wp-content/uploads/2020/05/Boletim-di%C3%A1rio-corona-04_05_2020-_1_.pdf
BA	4	http://www.saude.ba.gov.br/category/emergencias-em-saude/ http://www.saude.ba.gov.br/temasdesaude/coronavirus/notas-tecnicas-e-boletins-epidemiologicos-covid-19/
GO	4	https://covidgoias.ufg.br/#/map https://app.powerbi.com/view?r=eyJrIjoiNjM2MjQ2YTItMDQ0Mi00NmY0LTljYjEtNTExMTFlNDA5ZjYzIiwidCI6IjE4MzNkNDljLTQzZGItNGRmYy1hNDE3LWJjMDk4YjE0OGQ2MSJ9 https://extranet.saude.go.gov.br/pentaho/api/repos/:mapa_de_leitos:paineis:painel.wcdf/generatedContent#mapadeleitosPage
MA	4	http://www.saude.ma.gov.br/painel-atualizado-covid-19/
MT	4	http://www.saude.mt.gov.br/informe/584
MS	4	https://www.coronavirus.ms.gov.br/?p=1315https://www.coronavirus.ms.gov.br/?p=1465
MG	4	https://www.saude.mg.gov.br/coronavirus/painel https://www.saude.mg.gov.br/coronavirus/boletim http://www.transparencia.dadosabertos.mg.gov.br/organization/secretaria-de-estado-de-saude
PA	4	https://www.covid-19.pa.gov.br/#/
PB	4	https://superset.plataformatarget.com.br/superset/dashboard/72/
PE	4	https://dados.seplag.pe.gov.br/apps/corona.html
PI	4	https://datastudio.google.com/u/0/reporting/a6dc07e9-4161-4b5a-9f2a-6f9be486e8f9/page/3PzLB
RN	4	http://www.saude.rn.gov.br/Conteudo.asp?TRAN=ITEM&TARG=223456&ACT=&PAGE=&PARM=&LBL=MAT%C9RIA https://covid.lais.ufrn.br/
RO	4	http://www.odr.ro.gov.br/(X(1)S(nroipyu20bjujteh2h4bkmeh))/covid19painel/covid19?AspxAutoDetectCookieSupport=1
RR	4	https://saude.rr.gov.br/index.php/informacoesx/coronavirus/informacoes-coronavirushttps://roraimacontraocorona.rr.gov.br/winner/public/mapa.xhtml https://docs.google.com/spreadsheets/d/e/2PACX-1vQ7ESTQUYSwz3Gq3qDw64b58IxFPxxX30ApHaDKLpASsRXUducZNeOzQzfTNryeXTh2_rLASEMnooXN/pubhtml?widget=true&headers=false#gid=978513635
SC	4	https://app.powerbi.com/view?r=eyJrIjoiNDMyMDhkMWItZTI3NC00ZTkzLWJiNTEtOWE1YWQxZjg4MjI2IiwidCI6ImExN2QwM2ZjLTRiYWMtNGI2OC1iZDY4LWUzOTYzYTJlYzRlNiJ9
AP	3	http://painel.corona.ap.gov.br/ https://svs.portal.ap.gov.br/publicacoes
SP	2	https://www.seade.gov.br/coronavirus/
AC	1	https://agencia.ac.gov.br/agencia-de-informacoes-sobre-coronavirus/
AM	1	http://www.saude.am.gov.br/painel/corona/
PR	1	http://www.saude.pr.gov.br/modules/conteudo/conteudo.php?conteudo=3507
RS	1	https://ti.saude.rs.gov.br/covid19/
RJ	0	http://painel.saude.rj.gov.br/monitoramento/covid19.html
TO	0	http://coronavirus.to.gov.br/
		https://saude.to.gov.br/cievs---centro-de-informacoes-estrategicas-de-vigilancia-em-saude/coronavirus-covid-19/boletim--covid-19-----tocantins-/

ABOUT

We are over 40 researchers, actively engaged in the task of improving the quality of public policies within federal, state, and municipal governments as they seek to act amidst the Covid-19 crisis to save lives. We dedicate our energies towards rigorous data collection, devising substantial information, formulating indicators, and elaborating models and analyses to monitor and identify pathways for public policies and review the responses presented by the population.

The Solidary Research Network has researchers from all scientific fields (Humanities as well as Exact and Biological Sciences) in Brazil and overseas. For us, the combination of skills and techniques is vital as we face the current pandemic. The challenge ahead is enormous, but it is particularly invigorating. And it would never have come to fruition if it weren't for the generous contribution of private institutions and donors who swiftly answered our calls. We are profoundly grateful to all those who support us.

Visit our site: https://redepesquisasolidaria.org/
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