#### **Binghamton University**

#### The Open Repository @ Binghamton (The ORB)

**Working Papers Series** 

Citizenship, Rights, and Human Security

Spring 5-10-2024

### COVID-19 and Global Institutional Shift from National to Subnational Governments

Jonathan Feld-Jacobson Binghamton University--SUNY

Armaan Rizvi Binghamton University--SUNY

Bora Sinan
Binghamton University-SUNY

Follow this and additional works at: https://orb.binghamton.edu/working\_paper\_series

Part of the Comparative Politics Commons, Emergency and Disaster Management Commons, Health Policy Commons, Other Public Affairs, Public Policy and Public Administration Commons, and the Public Policy Commons

#### **Recommended Citation**

Feld-Jacobson, Jonathan; Rizvi, Armaan; and Sinan, Bora, "COVID-19 and Global Institutional Shift from National to Subnational Governments" (2024). *Working Papers Series*. 15. https://orb.binghamton.edu/working\_paper\_series/15

This Working Paper is brought to you for free and open access by the Citizenship, Rights, and Human Security at The Open Repository @ Binghamton (The ORB). It has been accepted for inclusion in Working Papers Series by an authorized administrator of The Open Repository @ Binghamton (The ORB). For more information, please contact ORB@binghamton.edu.

# Citizenship, Rights, and Human Security WORKING PAPER SERIES No. 114 | May 2024

## COVID-19 and Global Institutional Shift from National to Subnational Governments

Jonathan Feld-Jacobson, *Binghamton University*Armaan Rizvi, *Binghamton University*Bora Sinan, *Binghamton University* 

1 Feld-Jacobson, Rizvi, and Sinan

**Abstract** 

The COVID-19 Pandemic saw dramatic global shifts in legislative powers between central

and local governments. With changes in the severity and duration of the pandemic, in the

federations of Nigeria, Australia, and Canada, policymaking regarding border and school closures

and states of emergency saw an increasing involvement of regional governments. We suggest that

looking at the national and regional PPI data for our hypotheses could indicate directly the severity

of the pandemic in these nations. Federalisms particularly provide a case of institutional change

evidencing that COVID-era decision-making saw a change in the rules and expectations of

governance in the nations we analyze. Emergency powers that would have generally fallen upon

national governments were instead adopted by provincial bodies, the alternative spheres of policy

creation that mark federalism as a political system, because of inactivity at the national level.

Key words: Border Closures, School Closures, State of Emergency, Institutional Change,

Decentralization, Pandemic Decision-Making, Covid-19 Policy, Subnational Governance

#### 1. Introduction

The COVID-19 pandemic saw a dramatic shift in our world. Healthcare was prioritized, freedoms were diminished, and the global economy floundered. What has gone under the radar to most people, but not to political scientists, is the shift of power in the various national governments in the world. When the World Health Organization declared COVID-19 a global pandemic, many governments took strong initiative. They rapidly declared a state of emergency and consolidated immense power to their executive and legislative bodies. These actions were praised by many for helping reduce the threat of the disease, while others complained that it violated their freedoms and beliefs. Many of these national governments realized this and slowly started handing back power down to subnational levels, such as the state/provincial level or the local level. This shift of authority in handling COVID-19 protections and management is exactly what will be observed. The questions to be asked here are the following: How did power shift in the early months of the COVID-19 pandemic from national to subnational governments? What are the factors that can indicate this change? For research purposes, the focus will be made on federations, as the distinction between the national and subnational governments is more clear than in nonfederations. Specifically, the countries listed are Australia, Canada, and Nigeria. The factors that are believed to support the claim made are these countries' border closures, school closures, and state of emergency. Significant evidence, through data sets and figures, demonstrates this significant change. From this evidence, we believe that power shifted during the COVID-19 pandemic from national to subnational governments through the factors listed.

#### 2. Theory

Through analyzing the data from the Protective Policy Index (PPI) dataset (Shvetsova et al. 2022) for Nigeria, Canada, and Australia, we sought to look at the power-sharing dynamics of

federations across three different continents over the initial wave of the Covid 19 Pandemic (January to August 2020). Our research indicated that border and school closures and declaration of states of emergency were primarily initiated and maintained by regional/subnational governments, while national governments were not quite as involved in policy-making. In the case of school closures, national governments in federalist countries were able to 'shirk responsibility' by remaining inactive in the legislative process and allowing for the brunt of decision making to fall upon regional governments. Furthermore, the federalist framework also permitted for the healthcare policy to fall under the jurisdiction of the powers reserved to the states in many cases, which saw provincial states of emergency being utilized to respond to the pandemic in Nigeria, Australia, and Canada. Lastly, with migration and the spread of the virus being a key policy issue, local governments proactively developed border policy without necessitating a mandate or directive from the center, resulting in a better mitigation of the spread of the pandemic in the federalisms we studied.

#### 2.1 Literature Review

The COVID-19 Pandemic brought a strong change in our daily lives. The world had to adapt in a way unlike any time in history to reduce the spread of a disease that, at the time, seemed like it would be fatal to a huge portion of the population. To combat this issue to protect people, a variety of restrictions and policies were implemented. One of the most notable was the closure of schools. COVID-19 is an airborne virus, so being in close contact with someone positive for it likely means that the people around them will get it too. With that, many governments decided to shut down or limit large gatherings of people, the main one being schools. Schools were considered a hotbed for disease transmission, as many schools could contain hundreds of students and faculty

in an enclosed space. If one person had COVID-19, then surely the rest of the school would be compromised with the disease.

A large group of experts in this study, led by Joseph T. Wu, went to understand a broad version of the effects of school closures due to the pandemic in, "A global assessment of the impact of school closure in reducing COVID-19 spread."At the end of their conducted study, the experts found an interesting result in this measure of stopping the spread. To find this, the experts separated susceptible people into groups based on age, while taking a particular examination of older individuals and children. The focus nation was China, but the experts concluded that their results could easily be interpreted towards other nations, including the federations that are examined in this paper. The study results are as follows: school closures did have an impact on limiting the spread. However, children were much less likely to contract COVID-19 and transmit it to others, in comparison to adults and elderly people. They added, "Consequently, even prolonged school closure that could hypothetically eliminate all school contacts for weeks to months would have limited effectiveness in reducing transmissibility." (Wu, et al.) This essentially made the closure of schools not as effective as originally thought to be, even with its minimal assistance. In connection with this paper, it demonstrates the consolidation of power by the regional governments over this portion of society, although strong, did not truly have a significant change. This is also noted in our abstract in trying to understand the severity of the pandemic, in which school closures indicate it was not as horrific as initially viewed.

The second article to be looked at comes from a different study led by Lindsay F. Wiley from the University of California Los Angeles School of Law named, "Federalism in Pandemic Prevention and Response." Here, Wiley analyzes the impact of federalism in various nations constructed in that form during the COVID-19 Pandemic. In the article, a claim is made that the

federal government has the power to make or create laws and regulations to reduce disease infections, "but these guidelines have been inconsistent or absent." (Wiley) This results in the regional or local governments stepping up in the wake of the inaction. Wiley's primary focus in understanding this is through the healthcare system and understanding the preventive measures made, but some reference, although indirectly, is made towards school closures and other large gatherings of people. The article criticizes the national government's response and provides guidelines for the next steps in reducing the number of COVID-19 cases. Of note, the article was written in the middle of the pandemic, so full detailed information is limited. Regardless, the article proves the point that regional governments took significant action and held authority during the pandemic, more than the national government. The severity of the pandemic can be inferred then based on the regional government's response in the data provided in the next section, as national government data would not truly represent this understanding due to limited action taken by them. With this data, it can be highly inferred that powers regarding the handling of COVID-19 had been delegated to regional governments due to the inability of the national governments.

Declaring a state of emergency was a primary response applied by most regional governments to the pandemic from mid-March onwards. The COVID-19 and States of Emergency Symposium held from April 6th to May 20, 2020, saw representation from 74 countries, 41 of which had relied on the usage of their emergency powers in response to the pandemic. Federations tended to differ from non-federations, which typically declared national states of emergency, in the sense that their initial response was limited to provincial and subnational usage of emergency powers. We considered PPI data from 01/15/2020 to 08/15/2020 from the federations of Australia, Canada, and Nigeria, across three different continents to look at the scope of effective subnational power utilization at the global level.

Our methodology excluded federalisms that faced an overt imbalance of power leading to aggravated public health issues. For example, federalisms such as India had inadequate coordination between the central authorities, which unilaterally declared a nationwide lockdown, and the regional states, which were left to independently legislate on the migration crisis that followed the decree. Over-centralization was another challenge that led to an atypical federal response to pandemic management in Nepal, which has a long history of one-sided, centralized decision-making. As a new federalism, Nepal's national government, still adjusting to shared legislative practices, decided to commit national committees with no provincial representation to direct the pandemic response. The problems that Pakistan faced contrasted with those in India and Nepal. Pakistan demonstrates a case where the provinces initially favored and expected a nationwide lockdown but the Centre did not, resulting in a failure to direct an effective federalist response to the pandemic (Melbourne Forum, 2021).

#### **2.2 Cases**

Our research was limited to nations that exhibited the characteristic features of a federalism that permitted for decentralized legislation on healthcare policy. The division of powers that most federalisms are marked by often allocates healthcare policy to subnational authorities, while the center assumes domain over external relations and the economy. Thereby, federalist nations provide an ideal subset to research into regional authority in pandemic politics. The cases we selected for our study are diverse not only in their geography but also have variances in cultural attitudes towards federal governance owing to their colonial history.

Nigeria presents a model representation of a federalism where the federal government enacted a nationwide lockdown without assuming any emergency powers, to support and even encourage greater regional autonomy. Canada, as a well-adjusted established federalism, displays

provincial involvement in effective pandemic legislation to the fullest extent.. Australia's commitment to institutional dualism is also showcased by its intergovernmental collaboration. In preparation for the pandemic, Australia created a National Cabinet where the governors of its states could communicate with each other and the national government more frequently and openly to share information and come to a broad consensus on policy. When the first case was recorded, the states empowered the national government to declare a state of emergency to bolster containment and harm reduction measures (Grogan, 2020).

Thereby, our literature shows that federalism's delegation of decision-making authority to the subnational units provides an effective political framework where regional legislatures largely direct the pandemic response.

The COVID-19 Pandemic made everything we knew about the world change rapidly, almost in a single night. The panic caused by the pandemic made it almost impossible to fight the spread of the disease. Many people decided to isolate themselves inside and try to limit their interactions with others as much as they could. One thing all agreed on during the pandemic was that many people would travel both internationally and regionally whether they were contaminated or not. One question would come to their mind. Why is no one doing anything to limit this amount of traveling so that they could be protected from possible encounters?

Nations worldwide decided to shut down their borders but many have been too late to take the initiative. Previous encounters with other diseases such as SARS showed that a week's worth of delay to take action resulted in the duration of the pandemic to be prolonged four weeks. (Hossain et. al, 2020). With this aspect in mind, many federations have managed to be separated from this equation. Although the national governments took a bit longer to respond, the regional (sub-national) governments responded faster and took their own initiatives to shut down their

borders. It is not abnormal for the regional governments to take control over the situation during chaos since they are much more closer to the public and they can see the situation better and faster than the national government to acknowledge what is happening.

Border closures have been influential in fighting the spread and mitigate damages the pandemics can cause (Hossain et al, 2020). It is important to shut down outsider interactions to determine the already existing situation and then try to remedy the situation at hand without having to fight an undetermined amount that keeps increasing when the borders are open for everyone to use. Do they actually work? Yes but only when done early in the duration (Shiraef et al, 2022). With this aspect in mind, we can see the benefit of regional governments taking the initiative. Rather than waiting for the main government to take action and maybe too late to take action, the initiatives taken by the regional governments made it possible to decide early and get ahead of the situation.

#### 2.3 Data and Variables

Our data comes form Shvetsova et al. 2022 and is constructed from the following variables in their dataset.

- a) Soc\_and\_schls.all.nat.ave (School Closures National)Soc\_and\_schls.all.reg.ave (School Closures Regional)
- b) Borders.all.reg.ave.2 (Border Closures National) Borders.all.nat.ave.2 - (Border Closures - Regional)
- c) Emerg.all.nat.ave.2- (State of Emergency National) Emerg.all.reg.ave.2 - (State of Emergency - Regional)

When examining the dataset we saw that for countries; Nigeria, Canada, and Australia all the above-mentioned data worked as proof to show the difference between the initiatives that were taken by the national and regional governments.

#### 3. Analysis

With many countries at the outbreak of COVID-19 and the declaration of the pandemic by the World Health Organization (WHO), schools were immediately shut down because they were considered hotspots in the transmission of the disease. Various nations took different approaches to combat COVID-19 in schools. To identify the power of government in this area of concern during COVID-19, figures and data sets are provided. The countries listed are federations, in which power is evenly (or close to evenly) divided between national and regional governments. Listed in the table are three notable federations that took different approaches to handling COVID-19 in the early months of the pandemic, measured by PPI. Various dates are represented to evenly note the progression of authority in the early months of the COVID-19 pandemic. For example, the date 3/15/2020 is a benchmark as to when many schools and places of public gathering shut down to stop the spread, while 6/15/2020 is a benchmark as to when many schools opened up for the summer, as well as ease of restrictions. The three countries are divided into three regions: Africa, North America, and Oceania. Africa is represented by Nigeria. North America by Canada. Oceania by Australia. For all of these countries, authority was handled by the regional governments. Because of the large ignorance of the national government, regional governments increasingly became more authoritarian to stop the spread of COVID. Even in Australia (Figure 1A), where the national government became involved, later on, regional governments had more authority than national ones.

Figure 1A: National and Regional School Closures for Australia

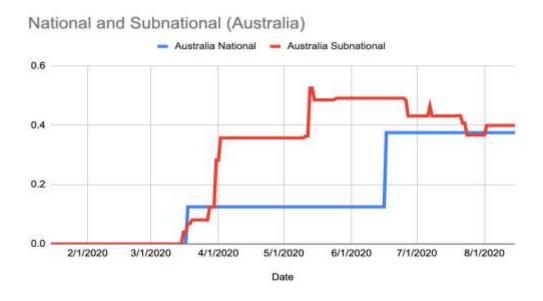


Figure 1B: National and Regional School Closures for Canada

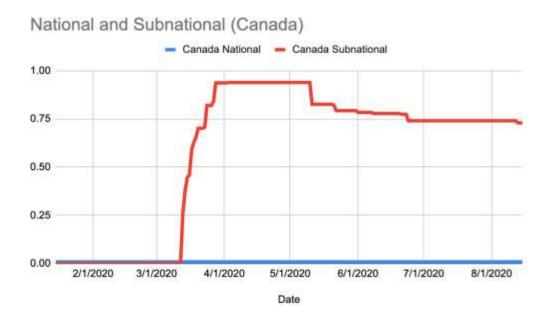
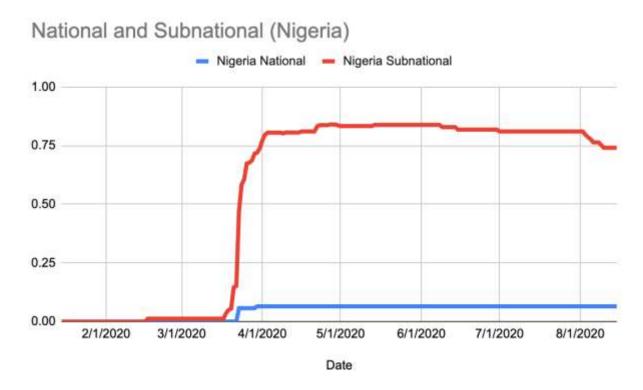


Figure 1C: National and Regional School Closures for Nigeria



Declaring a state of emergency was a primary response by most regional governments to the pandemic from mid-March onwards. We considered PPI data from 01/15/2020 to 08/15/2020 from the federations of Australia, Canada, and Nigeria. Our analysis of the PPI data in these figures shows that the national government was inactive in all three federations and that policymaking was largely carried out by subnational governments. States of emergency being enacted on local levels was thereby a preferred method of pandemic control that was commonly utilized by federalist countries. Settlement colonies such as Australia, the United States, and Canada benefited from less predatory taxation and political representation systems that allowed for a more stable democratic government more capable of undertaking measures on the national level. This is visible within the PPI data for Australia where we see an immediate spike when a state of emergency is declared over mid-July with the second wave of the pandemic taking hold globally.

Retrospectively, figures 2A and 2B indicate subnational governments assuming the responsibility of crisis control and collaborating with the national government to effectively mitigate the spread of the virus.

Figure 2A: National and Regional State of Emergency for Australia

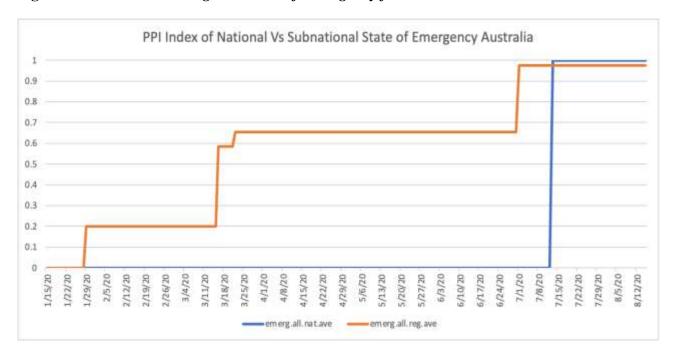


Figure 2B: National and Regional State of Emergency for Canada

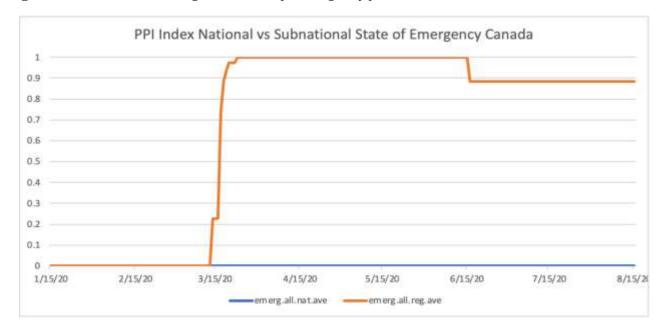
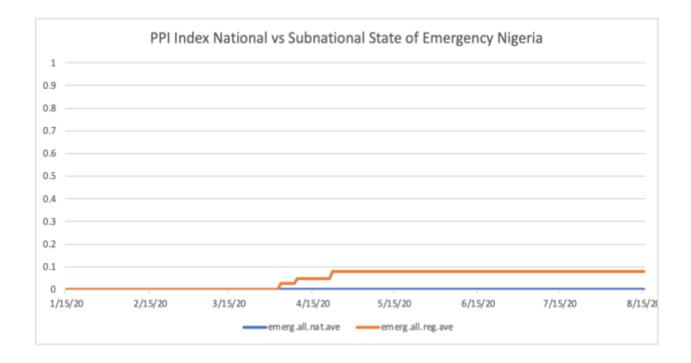


Figure 2C: National and Regional State of Emergency for Nigeria



When we are examining the COVID-19 responses that each country has given, we must understand the power dynamics of each country. For our research purposes, we have focused on federations since they can have conflicting opinions between the regional and national governments. When it comes to unitary countries, the only government may be late to implementing a policy or changing an already established one, but in federations, the regional government has the power to take the initiative and act faster for their region. The countries in our research paper have been chosen as Australia, Canada, and Nigeria. The rate of the increase in COVID-19 can be seen as tied to many factors but mainly is caused by interactions amongst the people who had COVID-19 and those who did not. In order to get ahead of the situation and try to help the recovery of the already infected people, the governments knew that one of the best scenarios to follow was closing themselves to the outside world so that they would be protected from further exposure. This region and nationwide isolation helped the governments fight the

pandemic more effectively, as can be seen from the data presented by the WHO's figures for new cases in each country. The PPI index shows us that the regional governments of Australia, Canada, and Nigeria have decided to take the initiative and close their borders rather than national governments implementing border closure policies. When the entire world decided that the threat of the pandemic had gone down and we could go back to our lives with a twist, everyone would have to adapt to this "new normal." Since the reality of COVID-19 still exists, we had to adjust how we lived so that we wouldn't have to go through the same chaotic environment that we had during the peaks of the pandemic.

In Canada (Figure 3B), the federal government had no involvement in the closure of schools, as their authority is handled primarily within the provinces. Canada, with many of their services, is handled by that level of government, with the federal government only allocating the proper amount of tax dollars and other forms of funding where needed. It is clear to see the dramatic rise in the regional line around March, which is when the World Health Organization declared COVID-19 to be a pandemic. The high level of school restrictions stayed relatively consistent until June, which is the month most schools are let out for summer break. With schools being out, restrictions were eased. With a better understanding of COVID-19 by the latter months of 2020, school restrictions slowly decreased, but still at a high level like nothing seen before the pandemic.

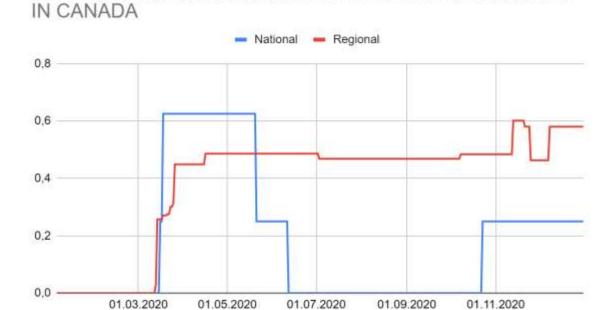
Much of the same could be stated with Nigeria (Figure 3A), with a few notable exceptions. The biggest point to notice is that in the early portion of the pandemic, the Nigerian federal government took some action, imposing its restrictions on schools separate from the regional governments, which usually have near-full authority. Just like Canada though, Nigeria's regional governments took swift action at the declaration of the pandemic, reaching record highs around

May 2020. Unlike Canada though, restrictions were not as eased, even when schools were let out for summer break. Regional restrictions stayed relatively high for the remainder of the calendar year in Nigeria (Figure 3C).

Figure 3A: National and Regional Border Closures for Australia



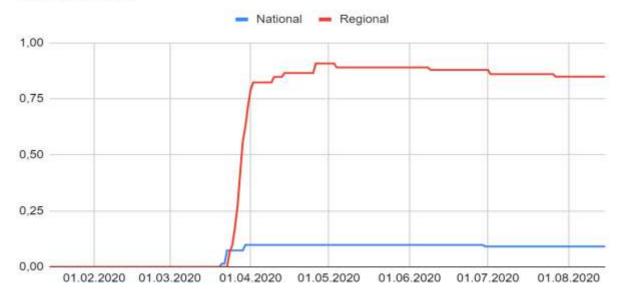
Figure 3B: National and Regional Border Closures for Canada



PPI INDEX BORDER CLOSURES NATIONAL VS REGIONAL

Figure 3C: National and Regional Border Closures for Nigeria





The Land Down Under had a strong mix of both national and regional government control over the school system, with the latter being the strongest for the majority of 2020 (Figure 1). Unlike the other two nations examined, Australia's summer break session comes in December and January. This meant that for the majority of 2020, schools were held. This meant more time and effort put into figuring out how to combat the disease in schools, which can subsequently be noted in Figure 1. Again, unlike the other two countries, Australia's national government took strong action as well, especially towards the latter half of 2020, when there was a strong second wave. In the end though, and for the majority of the year, Australia's regional governments had significant control in the decision-making of the closure of schools.

As with Nigeria, which has a colonial history of regional political dominance and a weak center, Australia is a case where the political framework of the nation entrusts a majority of internal decision-making to the subnational units. Particularly, while 'quarantine' follows under national

jurisdiction the states have residual powers of 'communicable disease and disaster management,' and this independence of subnational units to independently decide policy is exhibited in Figure 2C. Additionally, Nigeria, as a Presidential system of governance, provides a most dissimilar comparison to the parliamentary federations in Australia and Canada, and yet displays results replicable to those systems, stressing the robustness of the federalist political system in allowing for institutional change entrusting legislative authority to the peripheral spheres of governance.

Thereby, while these federalisms are capable of making urgent, centralized political decisions, the initial reaction to the pandemic was nearly completely free from national declarations of states of emergency. Importantly, the data also indicates a transition of power from regional to national spheres with the changing severity of the pandemic over time.

#### 4. Conclusion

Covid-19 pandemic saw dramatic shift of legislative powers from the national governments to subnational governments. We can clearly observe the shift in countries which accept federalism as their political system in which the line that seperates the national and the sub-national governments is more potent. The federations of Nigeria, Australia, and Canada were great candidates with their initiatives regarding; school closures, border closures, and states of emergency which we can see the regional governments' involvements more than the national governments. These emergency powers would normally fall upon the national governments were adopted by the subnational governments due to the severity of the pandemic and the inactivity at the national level of governance. The ability to 'shirk responsibility,' allowed for federations across the globe took the burden of producing immediate pandemic policy off the national governments, and placed the provinces at the center of political decision-making. School and Border closures and declarations of a State of Emergency were thereby initiated and maintained at

the regional level in these nations as opposed to most non-federations which remained inactive or turned to top-down governance in response to the public health crisis. Based on the data used from the PPI dataset, our research strongly indicates the systemic capabilities of federations to grant increasing responsibility to local governments in engaging in decentralized decision-making.

#### **Appendix:**

**Sources:** PPI Dataset - Linked Below

 $\frac{https://docs.google.com/spreadsheets/d/1GRzho63bhAWcSAeIvzxGqv9JaI4\_Fp\_ktVqkL5}{MJ-NA/edit\#gid=1582094809}$ 

Table 1: School Closures Data

Region	Country	Date	School Closures & Social Gatherings Restrictions (Nat Avg)	School Closures & Social Gatherings Restrictions (Reg Avg)	
Oceania	Australia 1/15/20 0		0		
		2/15/20	0	0	
		3/15/20	0	0	
		4/15/20	0.125	0.357	
		5/15/20	0.125	0.485	
		6/15/20	0.125	0.491	
		7/15/20	0.375	0.431	
	]	8/15/20	0.375	0.399	
North America	Canada	1/15/20	0	0	
		2/15/20	0	0	
		3/15/20	0	0.446	
		4/15/20	0	0.939	
		5/15/20	0	0.826	
		6/15/20	0	0.778	
		7/15/20	0	0.74	
		8/15/20	0	0.729	
Africa	Nigeria 1/1	1/15/20	0	0	
		2/15/20	0	0	
		3/15/20	0	0.012	
		4/15/20	0.065	0.806	

	5/15/20	0.065	0.838
	6/15/20	0.065	0.818
	7/15/20	0.065	0.81
	8/15/20	0.065	0.741

Table 2: State of Emergency Data

Region	Country	Date	Emergency (Nat Avg)	Emergency (Reg Avg)
Oceania	Australia	01/15/2020	0	0
		02/15/2020	0	0.201
		03/15/2020	0	0.201
		04/15/2020	0	0.655
		05/15/2020	0	0.655
		06/15/2020	0	0.655
		07/15/2020	1	0.974
		08/15/2020	1	0.974
North America	Canada	01/15/2020	0	0
		02/15/2020	0	0
		03/15/2020	0	0.226
		04/15/2020	0	1
		05/15/2020	0	1
		06/15/2020	0	1
		07/15/2020	0	0.883
		08/15/2020	0	0.883

Africa	Nigeria	01/15/2020	0	0
		02/15/2020	0	0
		03/15/2020	0	0
		04/15/2020	0	0.049
		05/15/2020	0	0.079
		06/15/2020	0	0.079
		07/15/2020	0	0.079
		08/15/2020	0	0.079

**Table 3: Border Closures Data** 

REGION	COUNTRY	DATE	BORDER CLOSURES NATIONAL	BORDER CLOSURES REGIONAL
	Australia	15.01.2020	0	0
		15.02.2020	0	0.201
Oceania		15.03.2020	0.25	0.201
		15.04.2020	1	0.394
		15.05.2020	1	0.394
		15.06.2020	1	0.394
		15.07.2020	0	0.394
		15.08.2020	0	0.636
		15.01.2020	0	0
		15.02.2020	0	0

		15.03.2020	0	0.257
North America	Canada	15.04.2020	0.625	0.449
		15.05.2020	0.625	0.486
		15.06.2020	0	0.486
		15.07.2020	0	0.468
		15.08.2020	0	0.468
		15.01.2020	0	0
	Nigeria	15.02.2020	0	0
Africa		15.03.2020	0	0
		15.04.2020	0.098	0.865
		15.05.2020	0.098	0.89
		15.06.2020	0.098	0.879
		15.07.2020	0.091	0.86
		15.08.2020	0.091	0.849
	1	ı	l	l

#### **CODEBOOK:**

- Border Closures:
  - borders.all.reg.ave.2
  - borders.all.nat.ave.2
- State of Emergency
  - emerg.all.nat.ave.2
  - emerg.all.reg.ave.2

- School and Social Gatherings:
  - soc\_and\_schls.all.nat.ave
  - soc\_and\_schls.all.reg.ave

#### **DATA REPLICATION:**

https://docs.google.com/document/d/1ukX3VpISGlAe6xt\_fOZKY6hPNlJm6Jwtym7FZZ7BxfA /edit?usp=sharing

#### **References:**

Grogan, Joelle. "States of Emergency: Analysing Global Use of Emergency Powers in Response to COVID-19." *European Journal of Law Reform*, vol. 22, no. 4, 2020, pp. 338-354. *HeinOnline*, https://heinonline.org/HOL/P?h=hein.journals/ejlr22&i=352.

Melbourne Forum on Constitution-Building (2021). How federations responded to Covid-19. https://law.unimelb.edu.au/\_\_data/assets/pdf\_file/0010/3908170/MF-Constitutional-INSIGHT-07-COVID-and-federations.pdf

Sala, Elisa, et al. "Structural basis for the final steps of human 40S ribosome maturation." *Nucleic Acids Research*, vol. 48, no. 6, 2020, pp. 3152-3167. *ScienceDirect*, https://www.sciencedirect.com/science/article/pii/S1755436520300244.

Shiraef, M.A., Friesen, P., Feddern, L. *et al.* Did border closures slow SARS-CoV-2?. *Sci Rep* 12, 1709 (2022). https://doi.org/10.1038/s41598-022-05482-7

Shvetsova, O., Zhirnov, A., Adeel, A. B., et al. (2022). Protective Policy Index (PPI) global dataset of origins and stringency of COVID-19 mitigation policies. Scientific Data, 9, 319. https://doi.org/10.1038/s41597-022-01437-9

Wiley, Lindsay Freeman, Federalism in Pandemic Prevention and Response (July 31, 2020). Burris, S., de Guia, S., Gable, L., Levin, D.E., Parmet, W.E., Terry, N.P. (Eds.) (2020). Assessing Legal Responses to COVID-19. Boston: Public Health Law Watch, Available at SSRN: https://ssrn.com/abstract=3675867

Wu Joseph T., Mei Shujiang, Luo Sihui, Leung Kathy, Liu Di, Lv Qiuying, Liu Jian, Li Yuan, Prem Kiesha, Jit Mark, Weng Jianping, Feng Tiejian, Zheng Xueying and Leung Gabriel M. 2022A global assessment of the impact of school closure in reducing COVID-19 spread *Phil. Trans. R. Soc. A.* 38020210124 http://doi.org/10.1098/rsta.2021.0124