COVID-19 Policy Response and the Rise of the Sub-national Governments

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Abstract

We examine the roles of subnational and national governments in Canada and the USA vis-à-vis protective public health response in the onset phase of the global COVID-19 pandemic. This period was characterized in both countries by incomplete and incorrect information as well as the uncertainty regarding which level of government should be responsible for which policies. The crisis represents an opportunity to study how national and subnational governments respond to such policy challenges. In this paper, we present a unique dataset which catalogues the policy responses of US states and Canadian provinces as well as those of the respective federal governments: the Protective Policy Index (PPI). We then compare the US and Canada along several dimensions including: the absolute values of subnational levels of the index relative to the total protections enjoyed by citizens, the relationship between "early threat" (as measured by the mortality rate near the start of the public health crisis) and the evolution of the PPI, and finally, the institutional/legislative origins of the protective health policies. We find that the sub-national contribution to policy is more important for both the US and Canada as compared to their national-level policies, and is unrelated in scope to our "early threat" measure. We also show that the institutional origin of the policies as evidenced by COVID-19 response differs greatly between the two countries and has implications for the evolution of federalism in each.

French Abstract

Nous examinons le rôle des gouvernements infranationaux et nationaux du Canada et des États-Unis dans la réponse protectrice préliminaire de la santé publique liée à la pandémie mondiale de COVID-19. Cette période a été caractérisée dans les deux pays par des informations incomplètes (ou bien erronées) ainsi que par une incertitude quant au niveau de gouvernement responsable de telle ou telle politique. La crise représente une opportunité d'étudier comment les gouvernements nationaux et infranationaux répondent à des défis politiques. Dans cet article, nous présentons un ensemble de données unique qui répertorie les réponses politiques des États américains et des provinces canadiennes ainsi que celles des gouvernements fédéraux respectifs : l'indice de politique de protection (IPP). Nous comparons ensuite les États-Unis et le Canada selon plusieurs dimensions, notamment: les valeurs absolues des niveaux infranationaux de l'IPP par rapport aux protections totales dont bénéficient les citoyens, la relation entre la "menace précoce" (mesurée par les taux de mortalité à l'approche du début de la crise de santé publique) et l'évolution de l'IPP, et enfin, les origines institutionnelles/législatives des politiques de protection de la santé. Nous constatons que la contribution infranationale à la politique est plus importante pour les deux pays mais qu'elle n'est pas liée à notre mesure de la "menace précoce". Nous

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démontrons également que l'origine des politiques diffère grandement entre les deux pays en question et que cela a des conséquences sur l'évolution du fédéralisme.

1.0 Introduction

The outbreak of a novel coronavirus at the beginning of 2020 provides a unique opportunity to study how different federations behave at the onset of a crisis. The resulting pandemic of COVID-19 created conditions of high uncertainty and imminent threat, and visibly affected how governments responded at different levels in both the USA and Canada. In responding to the threat, different levels of government were much more active than normal and often acted "out of turn." At least for the first months of the pandemic, these changes have reorganized the ways in which policy-making processes are conducted at the national, state, provincial and municipal levels. Stable federal balance between national and subnational units persists in successful democratic federations like the USA and Canada, while shifts, usually towards the relative strengthening of the federal level, take place slowly if at all (Dardanelli et al. 2019). Yet, the COVID-19 pandemic tilted the policy-making activism towards the subnational government in a matter of weeks andmight prove to be the ultimate un-balancing, or perhaps re-balancing, event.

In this article, we present an original dataset on national and sub-national public health policy response during the onset phase of the COVID-19 crisis – the Protective Policy Index (PPI). We demarcate the *onset phase* as the period between January 24 (first diagnosed COVID-19 case in France, indicating that the virus was not contained) and April 24, 2020 (which was the

last day in the period of non-decreasing subnational policy response in both Canada and the USA).[1]

Following this, we present a range of comparisons between Canada and the USA. The first dimension of comparison is the relationship between federal and sub-national versions of the index compared to the total protection enjoyed by citizens. We then examine the relationship between the evolution of the index over time and early mortality statistics by jurisdiction. Finally, we compare the institutional/governmental origin of the policies.

Our findings suggest that provinces and states, in particular, governors in the US, have taken a convincing lead in developing and adopting policies to mitigate the COVID-19 pandemic although the origins of these sub-national policies differ greatly between the two countries. We find no relationship in either federation between early threat to units as assessed by COVID-19 mortality in March 2020 and the speed or number of subnationally-enacted policies. We do see substantial differences in the agency origins of public health response and conjecture that those were due to institutional variation. We conclude by providing several possible causes for these patterns and suggesting avenues for further research.

2.0 COVID-19 Protective Policy Index (PPI)

Based on public health policy responses to COVID-19 at provincial, state and federal levels, we created the Public Health *Protective Policy Index* (PPI), calculating the index for each

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[1] On April 20th, South Carolina reopened some non-essential businesses, but negligible and thus below the threshold for our coding. Similarly on April 24th, Alaska, Georgia, Michigan, and Oklahoma reopened some non-essential businesses. After that date, measurable re-opening took place in a number of states. In Canada, on April 28th, the province of Alberta announced plans to re-open, and soon after decreased their policy response. On April 24th, New Brunswick lessened certain public health restrictions.

jurisdiction on each day which indicates the level of policy protection of a resident in that jurisdiction (the unit of analysis is thus *unit-day*). Using the PPI data, we separately calculate *Provincial, State,* and *Federal* versions of *the Index*. Presently, the data do not contain information on municipal response, but we plan to include it in the future.

We identify and code policies primarily from government resources, press releases, and reputable news sources, dating them based on first announcement. Policies fall into several categories: border closures (international and domestic), school closures, social gathering and social distancing limitations, home-bound policies (curfew, stay-at-home, lockdown), medical isolation policies (self-isolation and mandatory quarantine) closure/restriction of businesses and services (closure of nonessential businesses, restaurants, entertainment venues, government offices, public transportation, work from home requirements), the introduction of the state of emergency, and requiring mandatory personal protection equipment. The specifics of the index construction and the detailed discussion of the values assigned to categories and policies in it can be found in Supplement 1 in the online supplementary materials. While we did collect data on policies that specifically allocated funds towards the purchase of protective equipment, ventilators, and other medical supplies, for present purposes these policies are not included in the construction of the *Index*.[2] Furthermore, because the index is meant to measure protective public-health policies, we do not include health system-related measures or anything related to health-systems preparations that went on during this time. While these were important, the differences in the health system models between the USA and Canada make these comparisons impossible.

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[2] We did not include the needs-based distributive flows of national stockpiled medical and testing equipment.

We focus on measurable subnational and federal public-health policy response during the COVID-19 crisis onset.

The public health *Protective Policy Index* was constructed by adding together the highest values in each category of the coded subnational and federal policies on that day. Its daily possible minimum is 0 and maximum is 40. *Subnational* and *Federal PPIs* were constructed with the values in each category from just state or just federal policies. It often happens that state and federal policies are duplicates of one another at a given time. For example, there may be a federally-mandated self-isolation period and a self-isolation/quarantine requirement for a state/province based on the same or similar criteria. In this case, the federal policy would be counted towards the value of the federal PPI, and the subnational policy towards the state or province PPI. The policy would only be counted once, however, for the total value of the PPI for an individual living in a given jurisdiction, e.g. for an individual in state/province *j* at time *t*:

$$TotalPPI_{jt} = \sum_{categories} MAX[Federal\ in\ category_t; Subnational\ in\ category_{jt}] \ .$$

We have conducted content validation (Miller 2007) of these measures to ensure that we weighted the policies and categories based on their perceived effectiveness at the time.

It is important to note that particularly in the USA, municipalities were often first-movers on COVID-19 policy. The true value of the PPI will thus be understated in this analysis for states/provinces with stronger municipal responses. We hope to supplement and expand this analysis once the municipal data are added to the data used in this work. Since our query here is specifically the balance between national and subnational policy response in the COVID-19 emergency, we proceed with federal and state/province policy data.

3.0 Evolution of Policies

In COVID-19 policy response in the United States, the first action tended to come from state and local governments, though governments at every level had very little *ex ante* information on what types of policies might be effective. Indeed, municipal authorities in major cities and counties that saw the first outbreaks became first policy responders, ahead of states (e.g. Los Angeles County, CA; Houston, TX; Cook County, WA; Boston, MA; Mobile, AL; San Jose, CA; San Francisco, CA; Seattle, WA). State governments eventually took the lead on COVID-19 policy response. By the time President Trump issued a state of emergency on March 13, 2020, 64 percent of the states had already declared a state of emergency and initiated their own policy responses. Action came from states spanning the partisan continuum: solidly Democratic California and Hawaii as well as the Republican strongholds of Utah and Indiana each issued their state of emergency declarations a week or more prior to the President's. The national government, unlike many past emergency responses, generally acted after the states, endorsing non-binding guidelines put forth by the Center for Disease Control (CDC). These guidelines served as a template for the states that were reluctant to take action initially but did not become an enforceable policy in their own right, nor present as binding constraints in most states.

In Canada, the policy response has been spread out between bureaucratic institutional response by health authorities (which in the US was mostly absent) and provincial/federal government responses. Health Canada and the Public Health Agency of Canada (PHAC) have been at the forefront of Canada's discourse and public education about the virus, with separate briefings being held by Prime Minister Justin Trudeau and Chief Public Health Officer Theresa

Tam. The majority of actual COVID-19 related policy-making, however, took place within individual provinces. Furthermore, within provinces, directives have come from provincial Ministers of Health and from Chief Health Officers, and not through specific 'orders in council' (roughly-speaking in this context the parliamentary counterpart to an executive order). Indeed, the main role of the latter (provincial 'States-of-Emergency' are enacted through order-in-council) seemed to have been to enable the former to enact binding policies. Compared to the provinces, relatively few public-health-related laws have been passed by the federal government in response to COVID-19. Similar to the CDC in the US, the PHAC has opted to issue guidance and make recommendations which provinces could then decide to adopt or not. Indeed, as we will later show, an absence of federal policies would not have significantly reduced the overall PPI in most of Atlantic Canada.

4.0 ANALYSES

We conduct several exercises to compare the values of the PPI between Canada and the USA. We first explore the relationship between the state/provincial values of the PPI, federal PPI and the total PPI experienced by citizens. We next look at the subnational units' cumulative PPI levels throughout this period compared to an early measure of COVID-19 threat - mortality rates. Finally, we explore and compare the institutional/political origins of policies contributing to the PPI.

4.1 Federal/Subnational Contributions

Figures 1 and 2 present the values of PPI for citizens by subnational jurisdiction as well as federally for the USA and Canada respectively over time. The light gray dashed lines represent the values of the subnational indices, the solid line represents the value of the federal index, and the dashed black line represents the average value of the subnational indices weighted

by the units' shares of the population. The intent here is not to highlight the actions of individual states or provinces, but to show the variability in levels of protective policy as well as the relative timings of public health policy responses.

[Insert Figures 1 and 2 here]

Figure 1 shows the values of PPI experienced by the US population. We immediately note that the average American was exposed to approximately three times the strength of protective state policies by the end of the period than federal policies. We also see a wide disparity in the strength of policies across states, with a number of states having state PPIs over 30 by the end of the onset period, and others having PPIs of only around 15.[3] Figure 2 shows the same data for Canada. We see that the absolute strength of the Canadian federal policy response is higher. Similar to the USA, there is a large amount of variation between jurisdictions in the value of the PPI by the end of the period, and we note that the early-reacting states (those whose first policies were enacted by the first week of March) reacted more strongly to the pandemic than the early-reacting provinces.

Appendix 1 provides the information from figure 1 for the individual subnational jurisdictions as well as the total PPI. In appendix 2, for each province and state, we also calculate the relative value in its total PPI at the end of the period of the federal/subnational PPIs. This should be conceptualized as follows: For the subnational PPI, its relative value represents what fraction of the observed total PPI would have been experienced in the event of no federal action whatsoever. For the Federal PPI, its relative value represents what fraction of the observed total

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[3] For a preliminary indication of similar patterns in Brazil, see VanDusky-Allen et al. (2020).

PPI would have been experienced in the event of no subnational action[4]. We highlight the

experiences of Nova Scotians and British Columbians here. By the end of the policy period,

Nova Scotians would have had the exact same total PPI in the absence of any federal action.

Meanwhile, British Columbians would have had only 69% of their observed PPI in the absence

of federal action. For the US, all of the relative values of subnational PPIs are above 80% with a

number of states having a share of 1 at the end of the policy period (AK, IL, IN, LA, MI, MN,

and SC). The relatively high shares in the USA suggest that federal and subnational efforts were

not well-coordinated since state and federal policies were often duplicated. In Canada, with the

exception of Atlantic Canada, the shares are lower, indicating less duplication of federal policy at

the provincial level.

Next, we create the Cumulative PPI, which, for jurisdiction j is simply the sum of the

daily PPI over the entire policy period (i.e. $CumulativePPI_j = \sum_{t=1}^{T} PPI_{jt}$). The Cumulative

PPI combines information on how early the subnational policies started and how numerous they

were into a single measure. Both of these aspects were suggested by epidemiological research to

be essential for combating the spread of the coronavirus (Hsiang 2020, Pueyo 2020). Figure 3

shows the cumulative PPI for all the states and provinces. We note that the provinces are

distributed roughly in line with the states, suggesting that the speed and the level of subnational

response was not significantly different between countries. The cumulative PPI also provides us

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[4] Clearly in the absence of action from the other jurisdiction, federal and subnational
responses could have been different. We find this exercise useful to understanding the extent to
which subnational governments responded in ways which complemented the federal responses
and which duplicated or exceeded the federal responses. For a given total PPI, the greater the
relative value of the subnational PPI (or the lower the relative value of the federal PPI), the more
policy duplication occurred and the lower was the unique contribution of the federal government.

the opportunity to showcase the relative strength of overall policy response between the US and Canada.

To check the robustness of our conclusions to the alternative ways of combining the information about policies, we compute an alternative, IRT-based stringency index. Following Armstrong et al. (2020), we employ the *emIRT* package to recover a latent policy aggressiveness score for each government and day in our sample from the observed public health measures. The resulting subnational version of the index is correlated with the subnational PPI at 0.987, while the resulting overall score is correlated with the overall PPI at 0.990. Unsurprisingly, the replications of the major parts of our analysis with these alternative scores do not substantively change our conclusions. We provide the detailed comparison in Supplement 3 in the online supplementary materials. Furthermore, Supplement 4 offers the comparison of the PPI with the OxCGRT global data (Hale et al. 2020).

[Insert Figures 3a and 3b here]

4.2 Early Threat Indicator

We next show the evolution of the PPI during the COVID-19 onset phase as it relates to the threat of the pandemic as perceived by the decision-makers at the outset of the policy response window. Our indicator of an early threat is the mortality rate as of March 22, 2020.[5] We chose an early date because we want to gauge the jurisdiction-specific information available to leaders at the outset of the policy response window, rather than in looking at the COVID-19

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[5] We opt against the use of COVID-19 incidence as an early threat indicator. Differences in testing methodologies and case definitions during the onset phase make using confirmed cases a poor comparator across jurisdictions and especially internationally (or, in Canada, even within jurisdictions across time as Ontario and Québec both made a number of changes to how confirmed cases were reported).

mortality numbers as the outcomes of public health policies. Medical data for March 22 on COVID-19 mortality could be conjectured to inform governments' decisions, because, given the clinical progression timing of COVID-19 disease, the mortality indicator could not be itself a function of policies that were adopted after March 4, or 17.3 days before (Pueyo 2020). This indicator captures the true rates at which the disease was spreading in the population in early March. While we cannot observe such rates directly and reliably, Governors and Premiers would have had more intimate knowledge and expert advice which could take into account the jurisdiction-specific testing protocols and rates of positive COVID cases. We thus use the March 22 mortality data to proxy what the Premiers, Prime-minister, Governors, and President ought to have known near the start of our policy period. We chose not to use an earlier date because, prior to March 22, variation in COVID-19 mortality across US states and Canadian provinces was fairly low, which makes it hard to discern the levels of threat.

[Insert Figures 4a, 4b, and 4c here]

Figure 4a shows states' and provinces' deaths-per-million as of March 22, 2020. In figures 4b and 4c we show the intensity of the PPI for four days during our policy period in the USA and Canada respectively. There seems to be no relationship between this early threat measure and the strength or speed of the policy response by sub—national units in either the US or Canada. This non-relationship is further clarified in figure 5 where we show the Cumulative PPI (speed and strength of policy response) for the states and provinces with the Y-axis ranked by our measure of early threat (the number of deaths per million population on March 22).

[Insert Figures 5a and 5b here]

If early threat were predictive of an early and strong subnational policy response, the longest bars would appear at the top of the graph (if it were perfectly predictive, the bars would

be sorted perfectly in descending order). In Canada, BC, Ontario and Québec (which had the highest initial threat and arguably the highest forecasted threat since the three largest and ultimately hardest hit cities are in these provinces) are scattered throughout the distribution of Canadian Cumulative PPIs (Figure 5b). Similarly, in the USA, the initial threat does not seem to correlate with the states' Cumulative PPI (Figure 5a).

To further explore this observation, we conduct a series of Granger causality tests with mortality rates and incidence rates as the independent variable and the subnational PPI as the dependent variable in each subnational unit. Granger causality test rejects mortality and incidence as an explanation for public health policy stringency. There is heterogeneity in these results but not in excess of that expected in a sample of this size (60 panels). We included the estimates from the Granger causality tests in Supplement 5.[6]

4.3 Origin of Protective Policy

We conduct one final exercise with the PPI data to highlight the differences in origin-of-protective policy between the USA and Canada. As states, and state executives in particular, have engaged in massive extraordinary policy making, their role has become greater than has been customary in the American political process in the prior period. Figure 6 shows the origin for the policies in our dataset and Figure 6a highlights the substantial role American governors took in establishing policy compared to state legislatures and courts. At the state/province level, Canada and the United States seemed to differ in which branch of government took the lead in policy-making. In Canada, provincial legislatures continued to meet virtually or in a hybrid semi-

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[6] This conclusion is strengthened by comparing the direct Granger causality test with the reverse, where the DV and IV are switched. The reverse tests produce significant results.

in-person manner (Rayment and VandenBeukel 2020). Meanwhile, nearly all U.S. state legislatures decided to close their legislative sessions, deferring policy-making leadership and responsibilities to the state governor, opting not to continue to meet and legislate. The judiciary branch in both countries continued to conduct businesses and hear cases virtually, albeit at reduced capacity (Malloy 2020, Puddister and Small 2020, Rayment and VandenBeukel 2020). For the most part, courts have allowed the other branches to create policy largely unobstructed but, with some policies pushing constitutional boundaries, will likely expand their caseload involving COVID-19 policies (Macfarlane 2020).

The figure, however, does show that other state government branches have acted in response to COVID-19 and will possibly expand their role in future.

[Insert Figures 6a and 6b here]

In Canadian provinces, the over 150 policy items adopted during this period in over 70 policy episodes are categorized by their institutional origin in Figure 6b. When more than one type of an institutional actor joined in making the policy decision, we credited all of them as the originators of that policy. Summarily, as Figure 6b shows, over half of provincial protective public health policies had their origins with the provincial governments (Premiers, single ministers, groups of ministers, or cabinet committees). Over a third of overall policy production was due to public agencies, such as health officers, or the provincial public service. Provincial legislatures joined with governments in public health policy making on a few occasions, but COVID-19 provincial legislative output was mostly economic measures rather than protective policies. There was a lot of heterogeneity in the institutional origins of protective policies across provinces, with some dominated by political actors (e.g., British Columbia), while others relying on their Chief Health Officers.

That the COVID-19 initial protective policy response weighs so much more heavily with public agencies in Canada as opposed to the United States is, perhaps, the most striking contrast between the two federations. We conjecture that the blame avoidance theory and the differences in the health care bureaucracies between the two countries offer a plausible explanation for this observed difference. Because efficacy of certain policies, especially amidst emergencies, is *ex ante* unknown, political incumbents are motivated to strategically delegate decision making if possible or otherwise make decisions that would minimize subsequent blame (Hood 2010, Weaver 1986). These incentives are particularly strong when the outcome in case of a failure can be catastrophic. We conjecture that the overall desire to escape the blame had a two-prong effect on the behavior of the political incumbents during the high-uncertainty COVID-19 onset phase. First, it led national incumbents to either explicitly delegate or implicitly accept subnational leadership in public health policy response. Second, where individual accountability has made blame avoidance not feasible, political incumbents opted for a precautionary strong initial response. The institutional design in Canada, both at the constitutional level and in health provision, enabled substantially greater degree of delegation of protective policy-making. It enabled delegating policy making to the health bureaucracy, while the provincially centered health agencies were implicitly the leads in the actual policy making as indicated by the generally high visibility of public health chiefs both federally and across provinces.[7] In the United States, while the national government had stepped back, the constitutional separation of powers heightened the Governors' individual accountability for their states' health outcomes,

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[7] We thank the anonymous reviewer for emphasizing that variations in healthcare bureaucracy could have influenced government responses in both countries.

and the relatively weak subnational health bureaucracies have failed to serve as viable alternative agents of policy making.

In the US, given the unpopularity of lockdowns for various reasons that are beyond the scope of this work, the desire for federal divestiture from policy choices acquires additional rationale (even disregarding potential constitutional reasons for so doing). This also explains the abdication of responsibility by state legislators at a time when political leadership is critically needed. In Canada, blame avoidance is achieved by relying on institutions such as PHAC to essentially create policy. The voices and faces of unelected public health experts such as Bonnie Henry and Theresa Tam have been placed in the spotlight.[8]

We believe that there are shared as well as divergent experiences in policy response in United States and Canada. The nascent literature on Canada's COVID-19 policy response spans the Canadian political landscape, which could result in a lot of potential for comparative work with the United States and other federations. In the discussion section we rely on this emergent literature to attempt to explain the differences between the Canadian and United States COVID-19 policy responses that we have demonstrated above.

Discussion and Conclusion

Decision-making redundancies in democratic federations allows multiple officials at different levels of government to quickly respond to crises. The response to the COVID-19 pandemic in the USA and Canada both illustrate this point, with the subnational governments taking the lead in adopting policies to respond to the crisis. Yet, the exact mechanisms by which these policy responses were achieved in both countries varied. In Canada, public health care

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[8] This has not, however, been a universal reaction: in Ontario, as of this writing, Premier Doug Ford has refused to name the public health experts he is consulting in response to the crisis.

officials at the provincial level played a key role in developing policy while in the USA, governors took the lead.

Other recent scholarship has also examined how federal countries have responded to the COVID-19 crisis. Paquet and Schertzer (2020) apply the concept of complex intergovernmental problems to explain the Canadian response to the crisis, but they also offer the United States as one example of an appropriate comparison case. Additionally, Beland et al. (2020) suggest that the COVID-19 crisis could be a critical juncture in Canada politics that will lead to institutional change in Canada, affecting the equilibrium of their federal system. We reach similar conclusions for the US and Canada here, and explore the question from a system-theoretic perspective elsewhere.

Beyond just examining the federal and subnational dimensions of policymaking during the pandemic, other scholars have examined the role that partisan and ideological considerations affected the responses. Of note, Pickup et al. (2020) find that at although the national level, U.S. President Donald Trump and Canadian Prime Minister Justin Trudeau faced their first reported COVID-19 positive cases around the same time, they took different public stances in leading their respective countries. Additionally, Republicans at the subnational level in the USA as well as in the media tended to follow President Trump's downplaying of the pandemic's severity, while Democrats adopted more quick and comprehensive policy response (Merkley et al. 2020; Motta 2020).

Given that states in the USA, and particularly governors, took the lead in responding to the crisis in the USA, it is important to take into consideration how voters evaluated these responses. At least during the onset period, it appears that residents in every state rated their state governor's response higher than that of the President (Lazer et. al 2020). As time progresses, as

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the implications of state and federal level policy responses become more apparent, it would be worth examining whether these attitudes persist or change.

In contrast to the USA, in Canada, the public and elites appeared to be unified across party lines in supporting aggressive policy responses to the pandemic (Merkley et al. 2020). Canadians viewed measures like mask-wearing as a means to protect others, not just themselves (van der Linden and Savoie 2020). Canadians also appeared to have formed these policy preferences based on the perceived seriousness of the pandemic and trust in the ability of government to lead appropriately (Sevi et al. 2020). As a result, policymaking has been more cooperative in the Canadian experience. In future research, it would be worth examining whether variations in trust between USA and Canadian citizens in their respective governments' ability to respond to the crisis influenced policy responses at all levels of government.

Beyond examining national, state, and provincial responses to the COVID-19, Armstrong and Lucas (2020) have examined responses at the local and municipal levels in Canada and the U.S.A. Their findings suggest that both countries saw considerable levels of policy response. They also find that in both systems, local and municipal policy was partially determined by state and provincial governments. Aggressiveness of policy response in Canadian municipalities was argued to be a factor of population size and number of cases, while ideology and geography seemed to play a modest role.

The results of our analysis and the aforementioned studies provide insight into the affects that crises can have on altering the policymaking processes in federations. In the field of constitutional political economy, the much-regarded theory of federal institutional balancing finds that the self-interested behavior of political entrepreneurs in elections and at different levels of governments lead to self-enforcing institutional balancing, as agents continuously reach

compromises and form alliances in order to capture momentary political gains (see e.g. Benz and Sonnicksen 2017, Erikson and Filippov 2001, Lecours 2019, Sbragia 2002, Thorlakson 2007 and others). Whether the past federal balance in the U.S.A. and Canada will return or whether the COVID-19 crisis upended this balance in the future should be a topic of future research.

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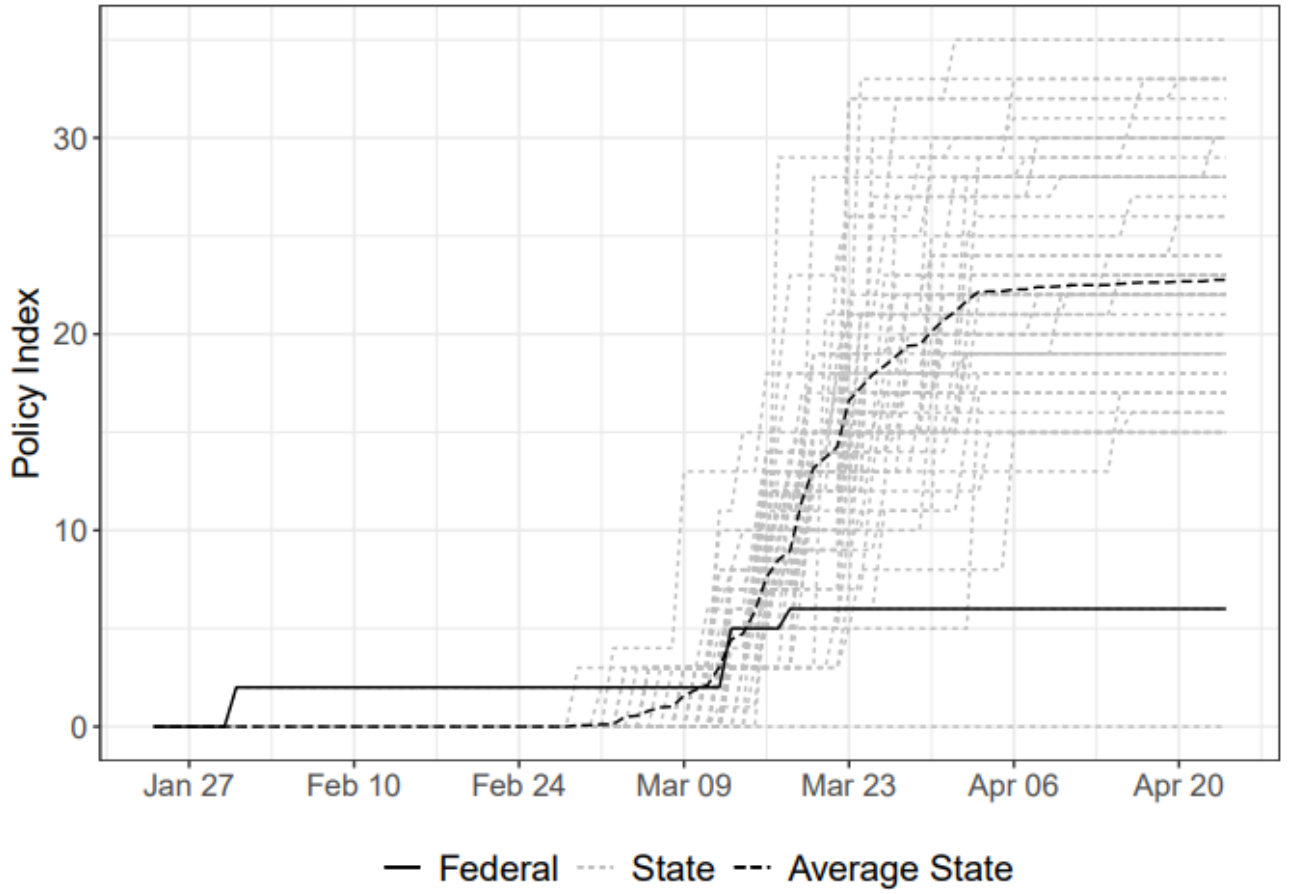
Figure 1. Comparison of Protection from State-only and Federal-only PPI in the United States
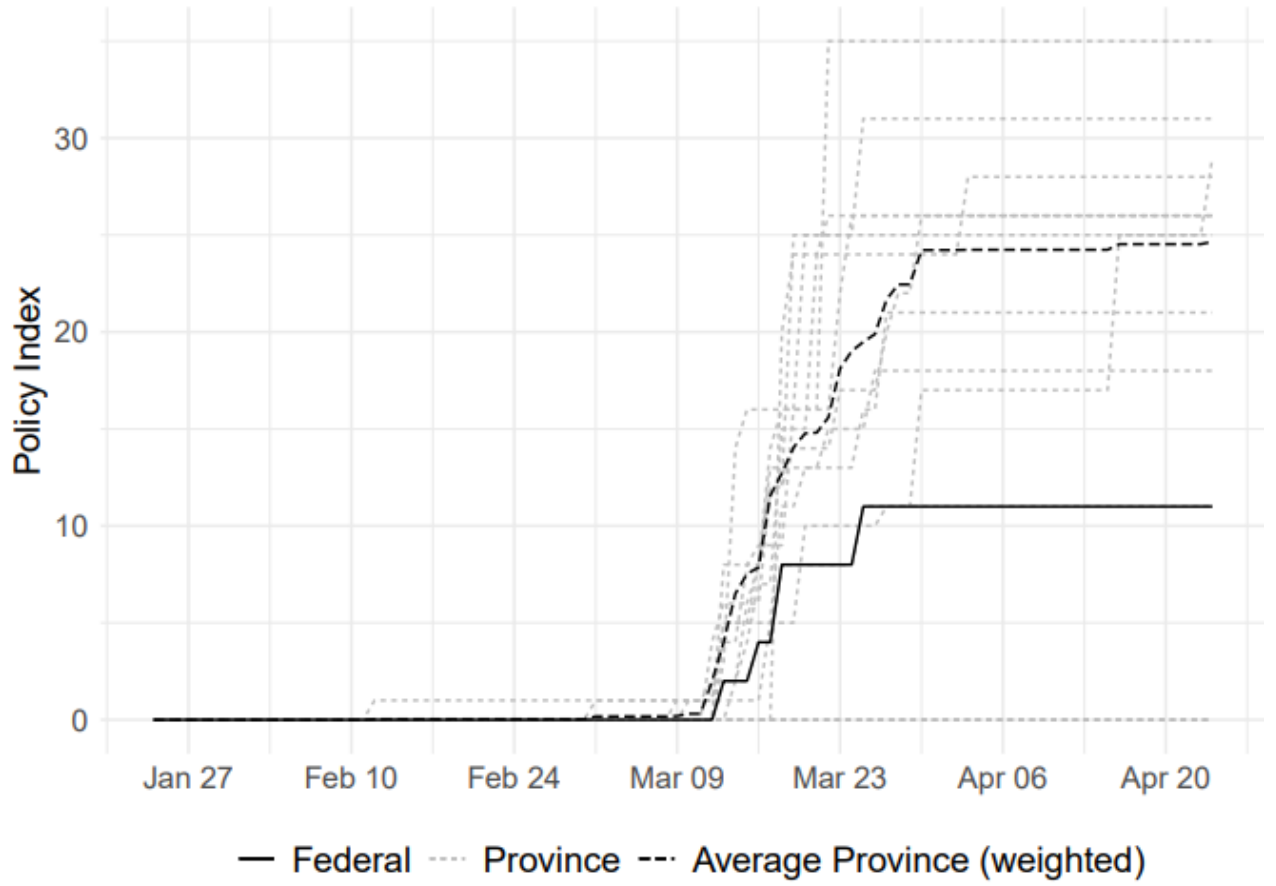
Figure 2. Comparison of Protection from Province-only and Federal-only PPI in Canada
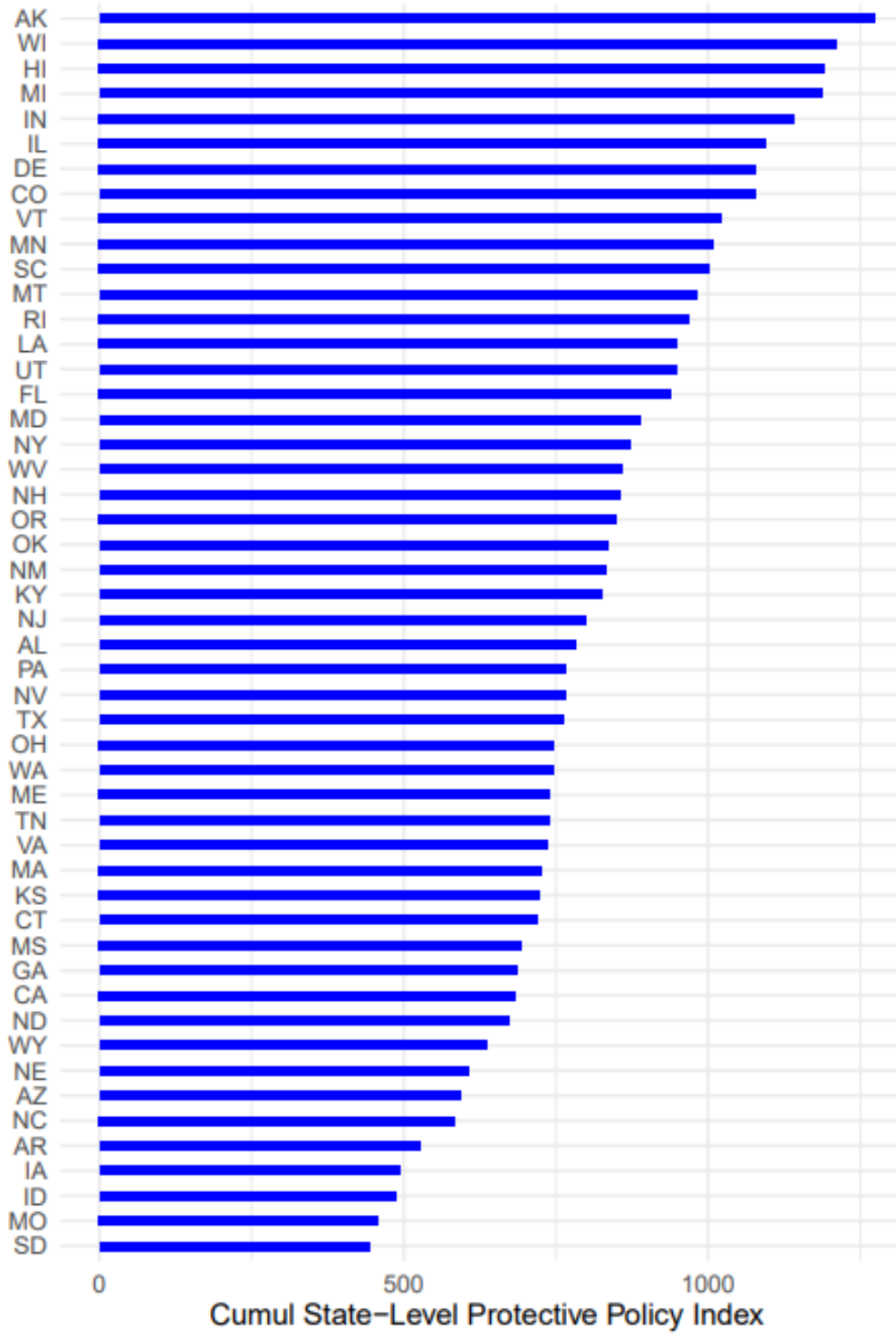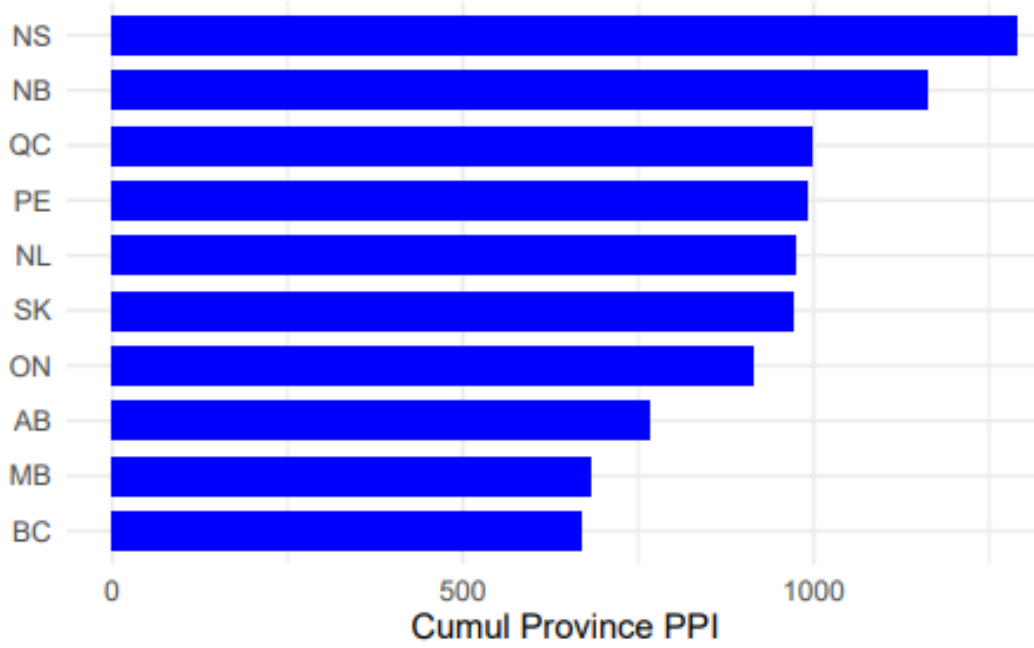
Figure 3a. Cumulative State PPI Rankings in the US

Figure 3b. Cumulative Provincial PPI Rankings in Canada
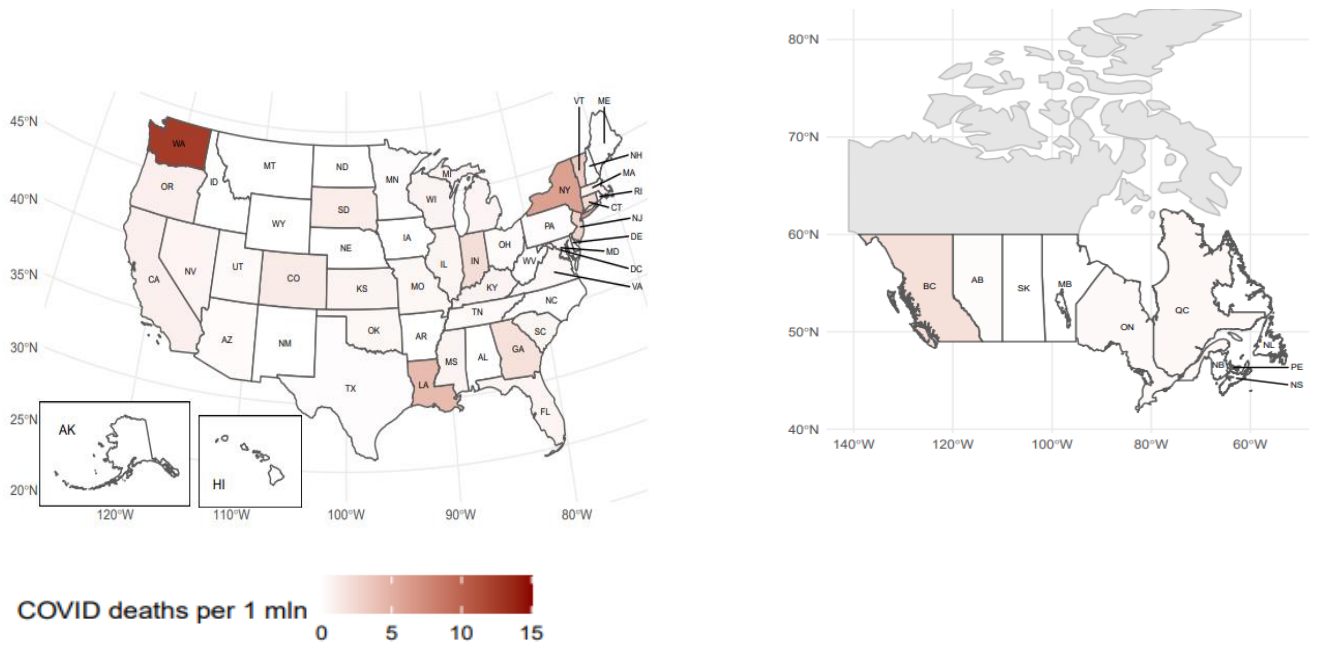
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Figure 4a. COVID-19 mortality rates by states and provinces as of March 22, 2020
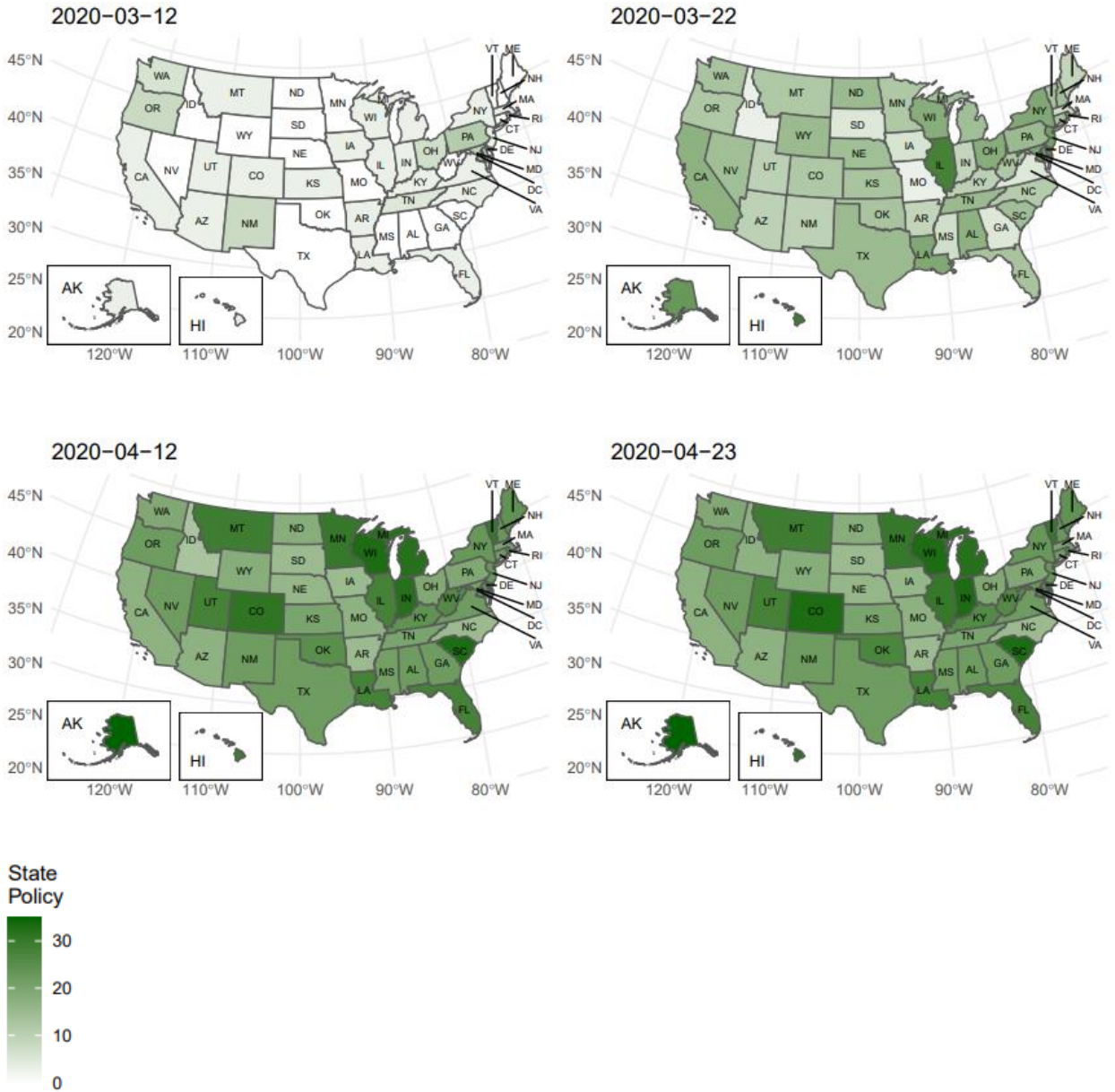
Figure 4b. Comparison of State PPI over time
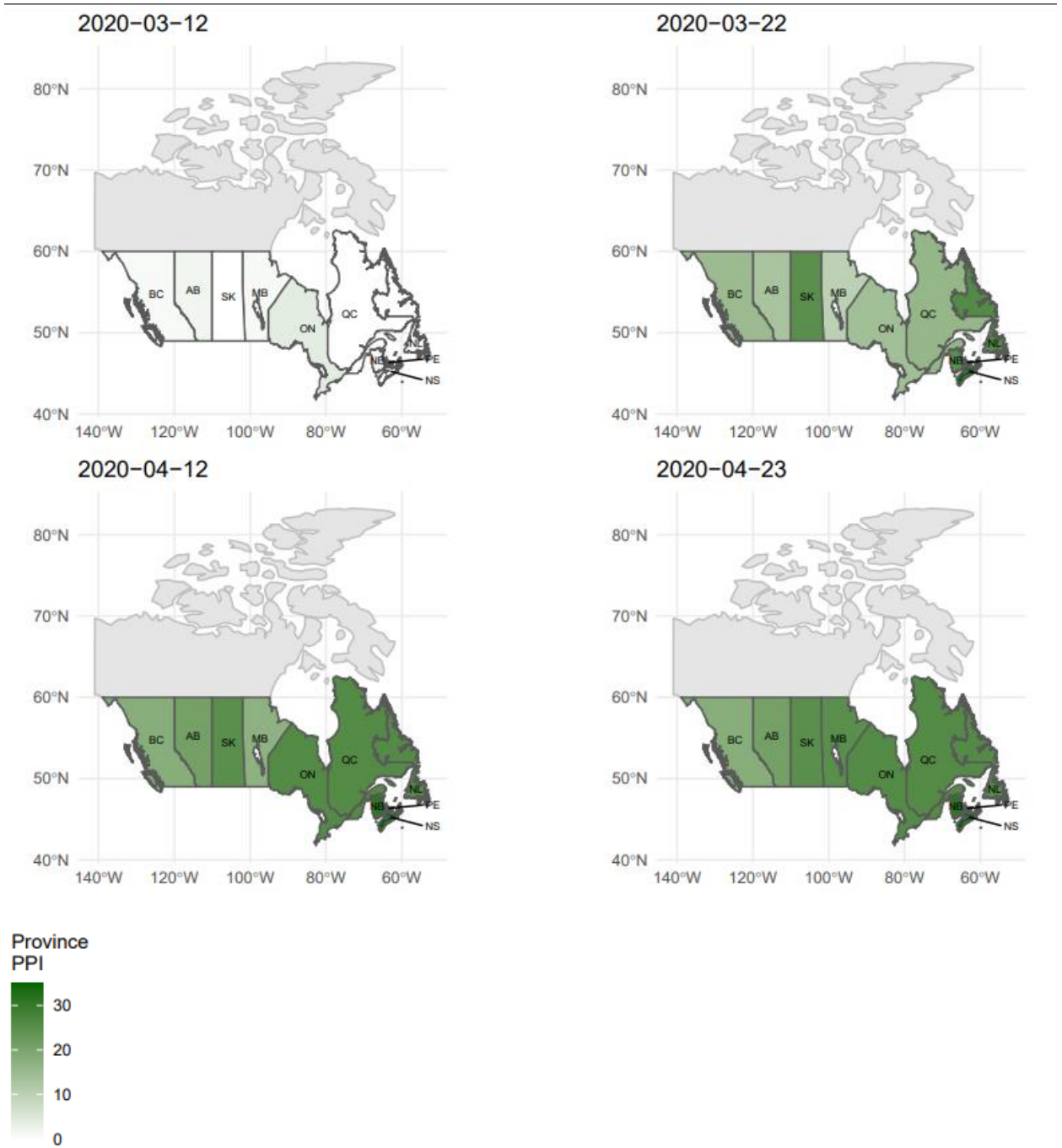
Figure 4c. Comparison of Provincial PPI over time
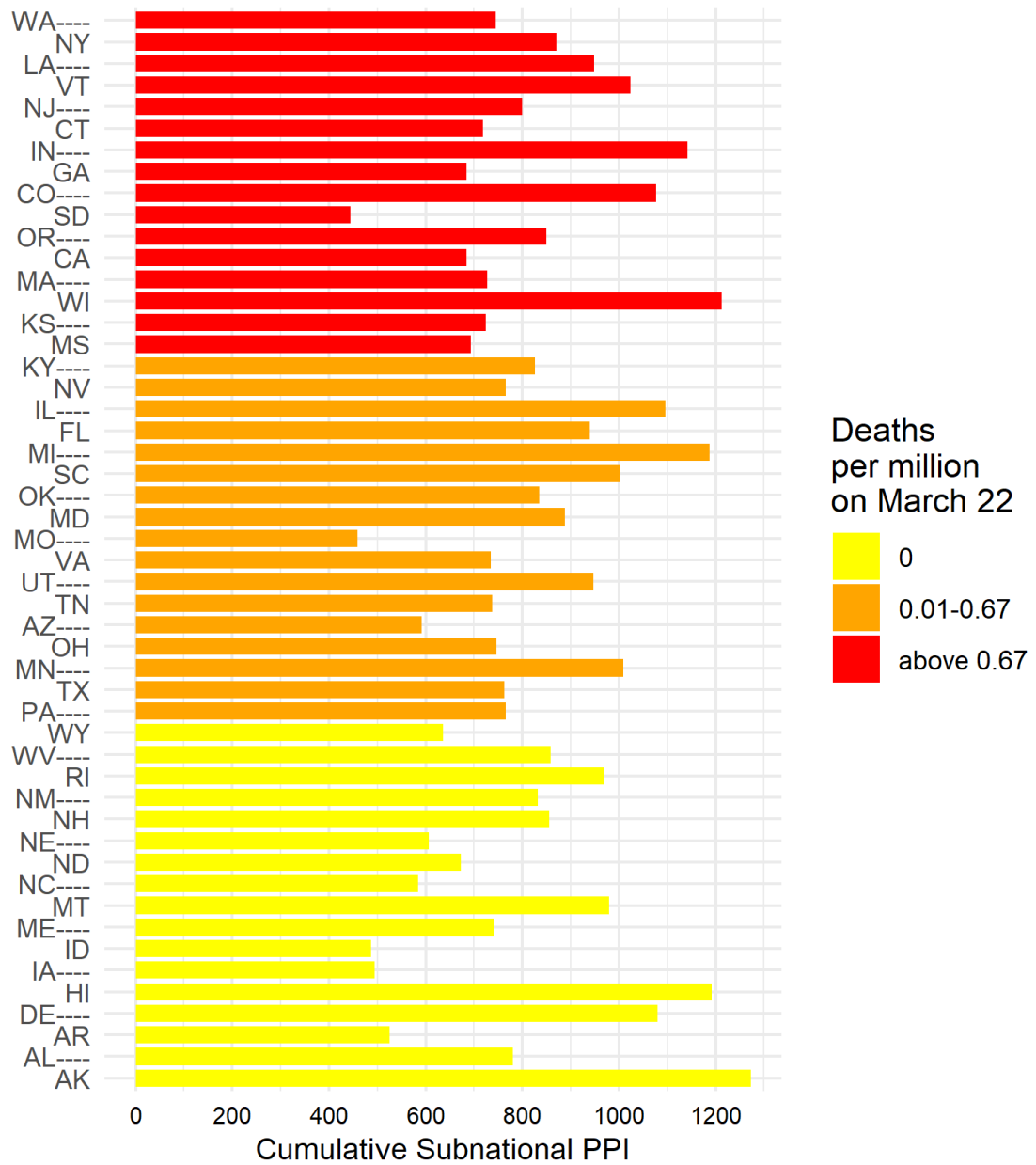
Figure 5a. US States' Cumulative State PPI and their Initial Threat Levels
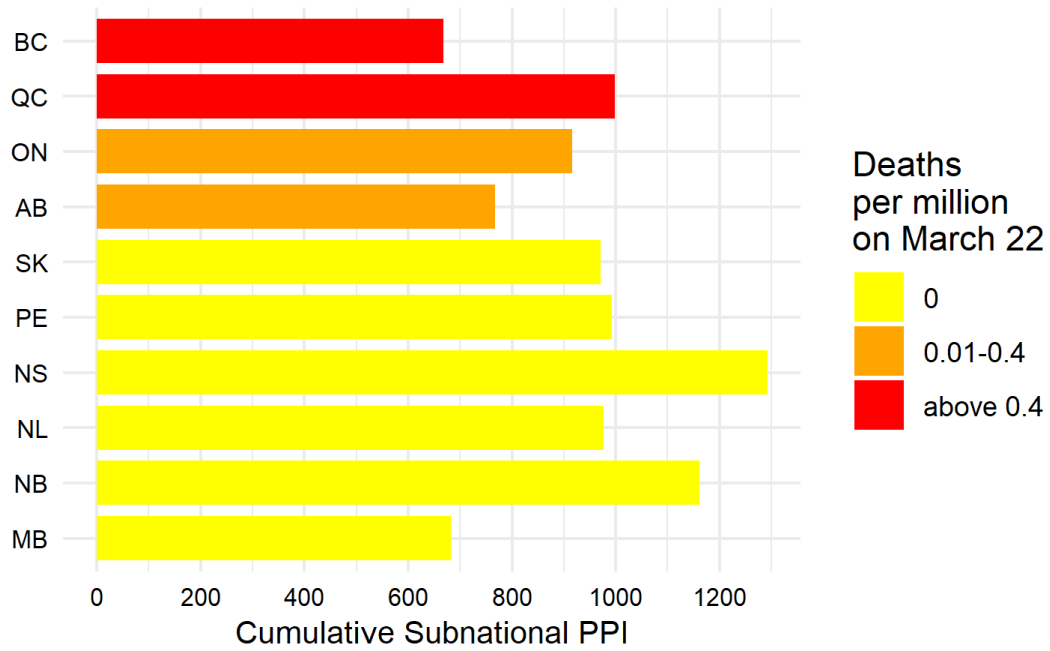
Figure 5b. Canadian Provinces' Cumulative Provincial PPI and their Initial Threat

Levels

This graph displays the percentage of US state policies based on the branch of government (executive, legislative, judicial, and bureaucracy) from which the policies originated.
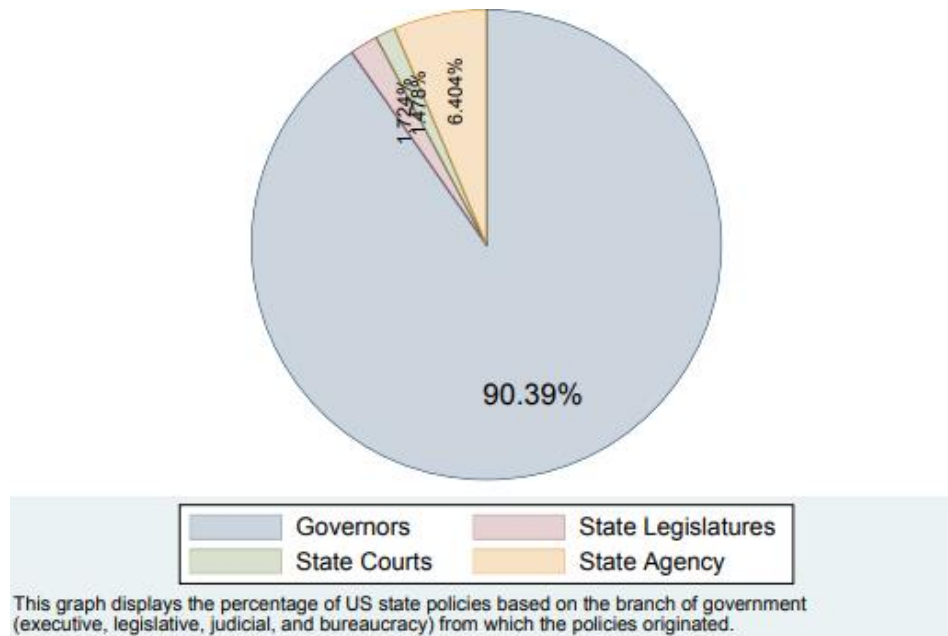
Figure 6a. States' Public Health COVID-19 Policies by Initiating Actor

This graph displays the percentage of Canandian provincial policies based on the policy origin (provincial government, provincial agency, and provincial legislature).
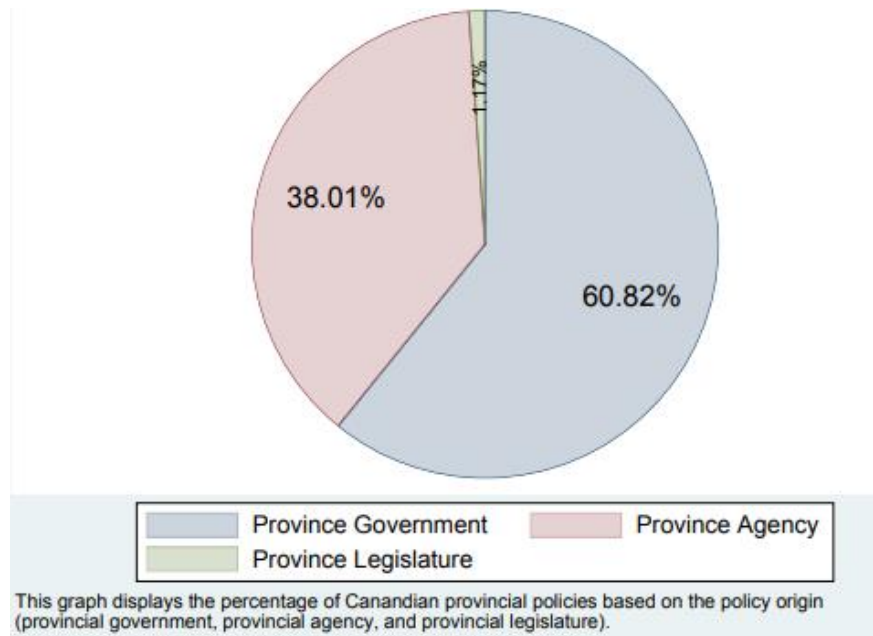
Figure 6b. Provinces' Public Health COVID-19 Policies by Initiating Actor

Appendix 1: Federal, Subnational and Total PPI from January 24 through April 24 2020

a) In the Canadian Provinces

b) In the American States

alabama	alaska	arizona
arkansas	california	colorado
connecticut	delaware	florida
georgia	hawaii	idaho
illinois	indiana	iowa
kansas	kentucky	louisiana

— — Province PPI   —·— Federal PPI   —— Combined PPI

oregon · pennsylvania · rhode island · south carolina · south dakota · tennessee · texas · utah · vermont · virginia · washington · west virginia · wisconsin · wyoming
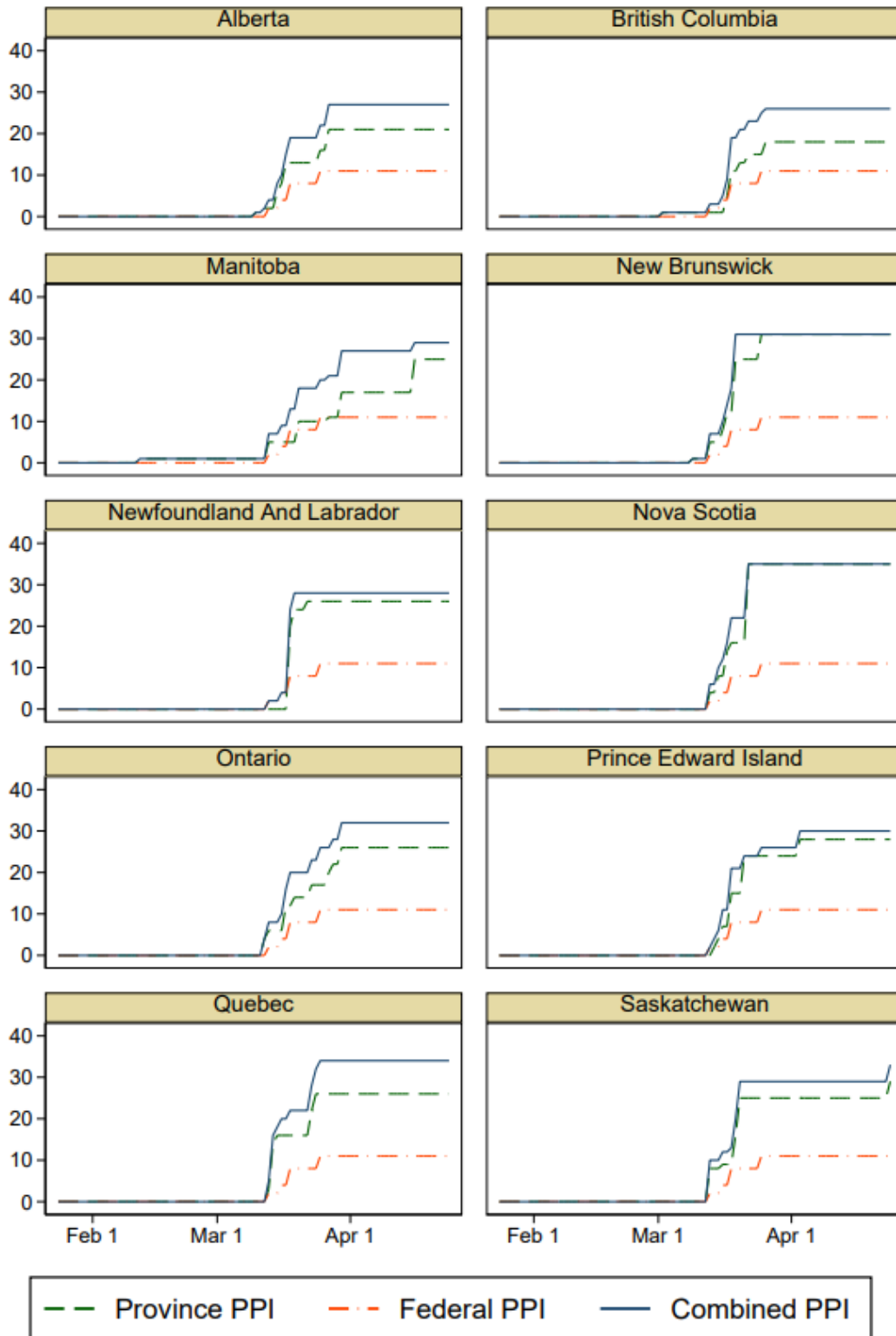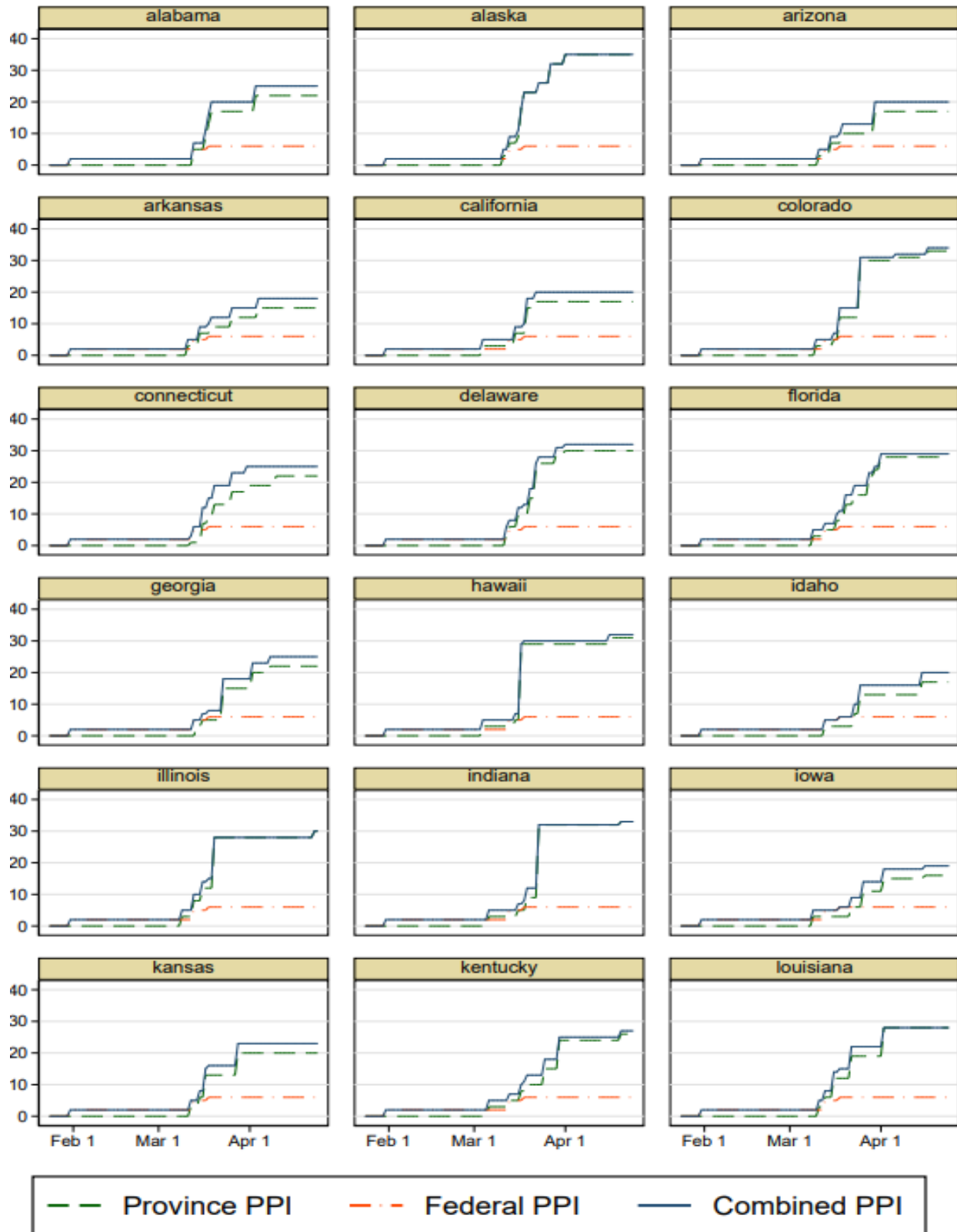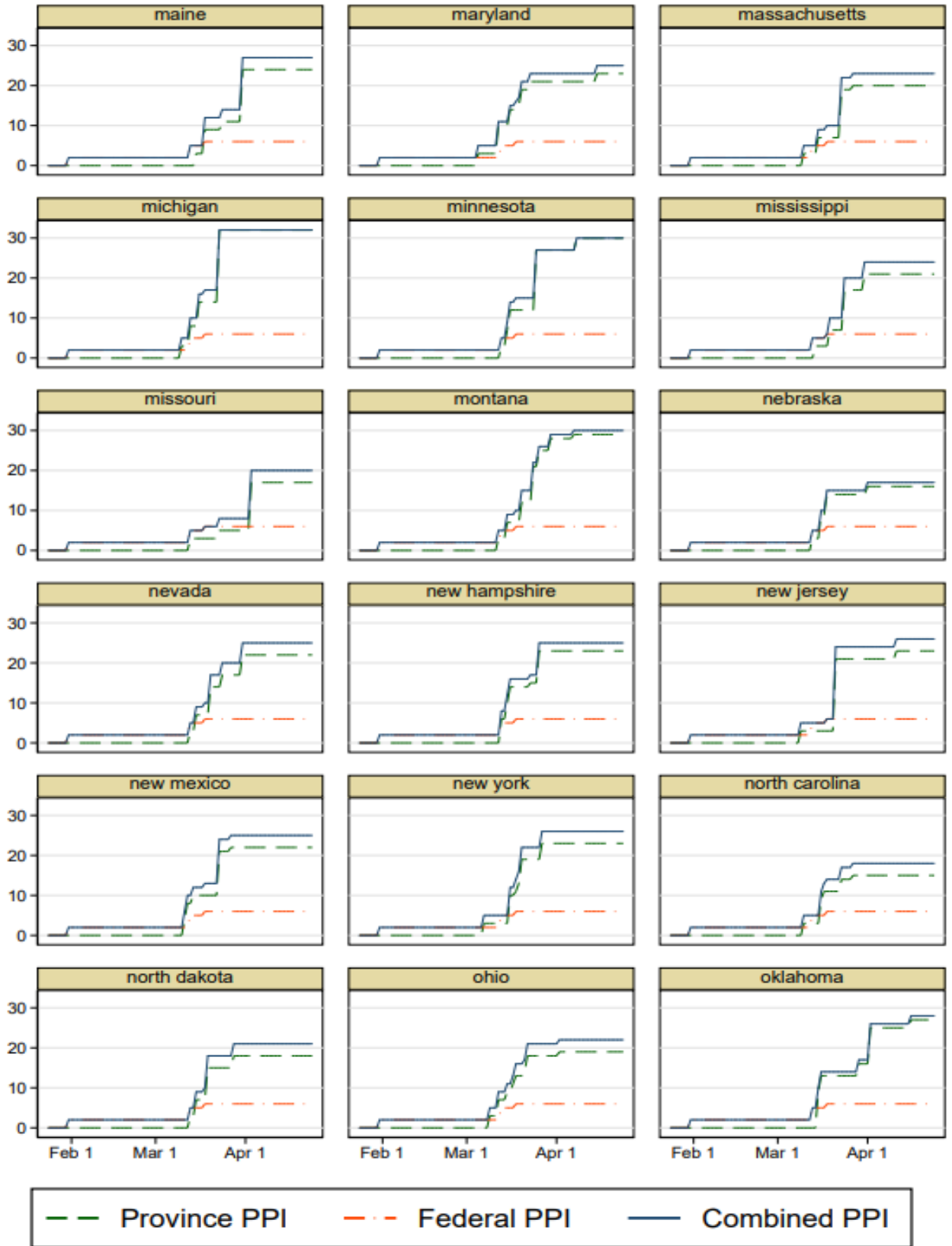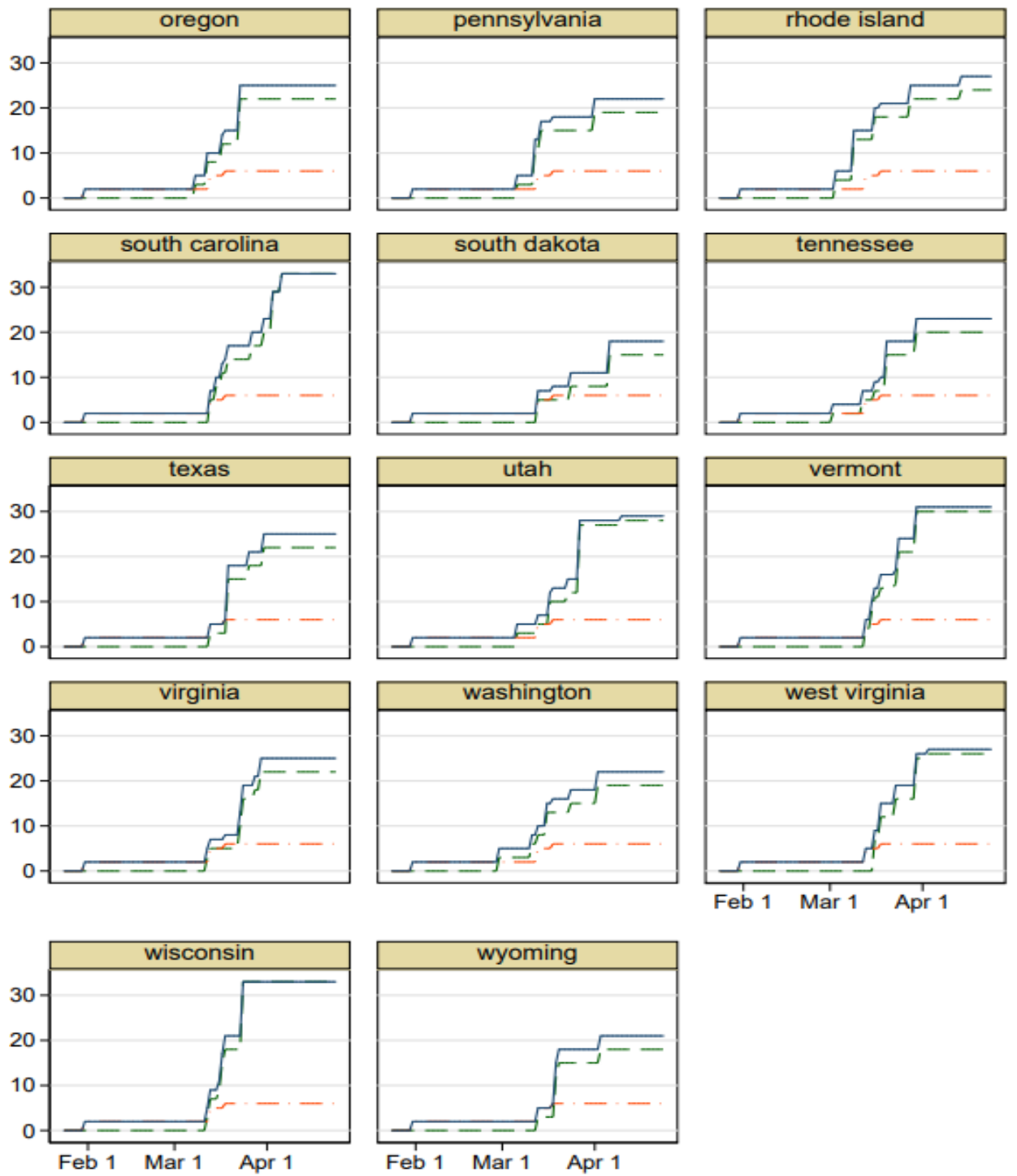
Appendix 2: Relative Values of Federal and Subnational PPI in Units' Total PPI, as of April 24 2020

a) In the American States:

State	Subnational PPI/ Combined PPI	Federal PPI/ Combined PPI	Unique subnational policies	Unique federal policies	Subnational PPI	Federal PPI	Combined PPI
AK	1.00	0.17	0.83	0.00	35	6	35
AL	0.88	0.24	0.76	0.12	22	6	25
AR	0.83	0.33	0.67	0.17	15	6	18
AZ	0.85	0.30	0.70	0.15	17	6	20
CA	0.85	0.30	0.70	0.15	17	6	20
CO	0.97	0.18	0.82	0.03	33	6	34
CT	0.88	0.24	0.76	0.12	22	6	25
DE	0.94	0.19	0.81	0.06	30	6	32
FL	0.97	0.21	0.79	0.03	28	6	29
GA	0.88	0.24	0.76	0.12	22	6	25
HI	0.97	0.19	0.81	0.03	31	6	32
IA	0.84	0.32	0.68	0.16	16	6	19
ID	0.85	0.30	0.70	0.15	17	6	20
IL	1.00	0.20	0.80	0.00	30	6	30
IN	1.00	0.18	0.82	0.00	33	6	33
KS	0.87	0.26	0.74	0.13	20	6	23
KY	0.96	0.22	0.78	0.04	26	6	27
LA	1.00	0.21	0.79	0.00	28	6	28
MA	0.87	0.26	0.74	0.13	20	6	23
MD	0.92	0.24	0.76	0.08	23	6	25
ME	0.89	0.22	0.78	0.11	24	6	27
MI	1.00	0.19	0.81	0.00	32	6	32
MN	1.00	0.20	0.80	0.00	30	6	30
MO	0.85	0.30	0.70	0.15	17	6	20
MS	0.88	0.25	0.75	0.13	21	6	24
MT	0.97	0.20	0.80	0.03	29	6	30
NC	0.83	0.33	0.67	0.17	15	6	18
ND	0.86	0.29	0.71	0.14	18	6	21
NE	0.94	0.35	0.65	0.06	16	6	17
NH	0.92	0.24	0.76	0.08	23	6	25
NJ	0.88	0.23	0.77	0.12	23	6	26
NM	0.88	0.24	0.76	0.12	22	6	25
NV	0.88	0.24	0.76	0.12	22	6	25
NY	0.88	0.23	0.77	0.12	23	6	26
OH	0.86	0.27	0.73	0.14	19	6	22

OK	0.96	0.21	0.79	0.04	27	6	28
OR	0.88	0.24	0.76	0.12	22	6	25
PA	0.86	0.27	0.73	0.14	19	6	22
RI	0.89	0.22	0.78	0.11	24	6	27
SC	1.00	0.18	0.82	0.00	33	6	33
SD	0.83	0.33	0.67	0.17	15	6	18
TN	0.87	0.26	0.74	0.13	20	6	23
TX	0.88	0.24	0.76	0.12	22	6	25
UT	0.97	0.21	0.79	0.03	28	6	29
VA	0.88	0.24	0.76	0.12	22	6	25
VT	0.97	0.19	0.81	0.03	30	6	31
WA	0.86	0.27	0.73	0.14	19	6	22
WI	1.00	0.18	0.82	0.00	33	6	33
WV	0.96	0.22	0.78	0.04	26	6	27
WY	0.86	0.29	0.71	0.14	18	6	21

b) In the Canadian Provinces

Province	Subnational PPI/ Combined PPI	Federal PPI/ Combined PPI	Unique subnational policies	Unique federal policies	Subnational PPI	Federal PPI	Combined PPI
AB	0.78	0.41	0.59	0.22	21	11	27
QC	0.76	0.32	0.68	0.24	26	11	34
BC	0.69	0.42	0.58	0.31	18	11	26
SK	0.88	0.33	0.67	0.12	29	11	33
ON	0.81	0.34	0.66	0.19	26	11	32
NL	0.93	0.39	0.61	0.07	26	11	28
NS	1	0.31	0.69	0.00	35	11	35
PE	0.93	0.37	0.63	0.07	28	11	30
MB	0.86	0.38	0.62	0.14	25	11	29
NB	1	0.35	0.65	0.00	31	11	31

DEFINITIONS:

subnational PPI = overlapping policies + unique subnational
federal PPI = overlapping policies + unique federal
federal share = (federal PPI)/(federal PPI + unique subnational policies)
subnational share = (subnational PPI)/(subnational PPI + unique federal policies)