How does policy learning take place across a multilevel governance architecture during crisis?

Author Accepted Manuscript (AAM)

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Abstract

Policy learning plays a significant role in shaping policy during crises. While scholarship has explored many of the mechanisms and outcomes of such learning, little is known about how policy learning takes place across different levels of multilevel governance, despite their prevalence and influence on crisis responses. Using an exploratory case of the Belgian COVID-19 policy response, we explore how policy learning takes place across different levels of multilevel governance within creeping crises, focusing on epistemic policy learning (learning from experts) as one of the most pronounced learning types within such contexts. Using document analysis supplemented by primary source data from expert and senior official interviews, we offer an exploratory account of how learning took place at the national and subnational levels. Our findings reveal how the inherent features of the COVID-19 crisis, and the existing multilevel governance architecture broke the policy learning process into smaller heterogenous learning processes at different levels. We find that decentralized approaches to learning provided the space for customized, yet often fragmented policy responses. We also find that institutional legacies, varying degrees of policymaker control over learning, and absence of common approaches to structuring and designing learning processes led policymakers in different jurisdictions to engage in varying policy learning processes. We take stock of these different learning processes and highlight their key features. We conclude by highlighting the implications of these findings for policy learning theory and practice.

Key Words: policy learning; Epistemic Communities; Multilevel Governance; Crisis Governance; COVID-19; crisis; Belgium; creeping crises.

1. Introduction

In public policy, learning can be understood as the process by which policy actors interact with policy related knowledge and information to update their understandings and beliefs regarding policy issues and gain insights on potential policy adjustments (Zaki, Wayenberg & George, 2022). Accordingly, policy learning is often leveraged in policy analysis to explain the how and why of policy change, or the lack thereof (e.g., Bennett & Howlett, 1992; Dunlop & Radaelli, 2017).

Policy learning often plays a substantial role during crises, as they can serve as focusing events, or urgent technically complex situations that -to be effectively prepared for or handled- require or offer opportunities for learning. Hence, learning processes taking place around crises help explain variations in policymaking trajectories and thus outcomes (e.g., Zaki & Wayenberg, 2021; Authors, forthcoming). This resulted in two main strands of crisis learning research emerging: inter-crisis and intra-crisis learning (see Kamkhaji & Radaelli, 2017). Inter-crisis (i.e., post-crisis) learning focuses on the retrospective production of lessons, their types, depth, and degrees of institutionalisation (e.g., Raudla et al., 2018). Intra-crisis learning mainly focuses on how policy learning processes interact with the crisis context to produce different types of lessons as crisis episodes unfold (e.g., Kamkhaji & Radaelli, 2017; Authors forthcoming).

While the importance of inter-crisis learning has been long-established, understanding of intra-crisis learning processes is increasingly pressing, particularly with the emergence of "creeping crises" (e.g., the COVID-19 pandemic, migration, climate change, political and military tensions). These are lingering crises that shape the policymaking context for extended periods (Boin et al., 2020). There, policy learning continues to inform actors on critical issues in real-time over years, rather than days or weeks, unlike shorter-term crises such as natural disasters or "single-episode" shock events (e.g., Kamkhaji & Radaelli, 2017).

Intracrisis learning research has explored various areas, including: how do organizational *actors* manage learning and adapt to crisis evolutions (e.g., Lee, Hwang, & Moon, 2020), how politico-administrative legacies, crisis-related *knowledge, and information* influence learning (e.g., Zaki & Wayenberg, 2021), and how different policy learning types shift and interact within certain *contexts* leading to policy change as *policy issues* evolve (Authors, forthcomings). However, policy learning does not occur in a vacuum. While it is understood as an interaction between *policy issues*, *actors*, *knowledge*, and *structures* within a policymaking *context*, we know relatively little about interactions between policy learning and the governance structures in which it occurs (Bomberg, 2007). Particularly, how policy learning takes place across multilevel governance *structures*, especially within creeping crisis contexts (see Zaki, Wayenberg & George, 2021; Mavrot & Sager, 2018; Neij & Heikkinen, 2021).

Most recently, the technically complex nature of COVID-19 crisis has emphasized the role of epistemic policy learning, i.e., learning from experts (Dunlop & Radaelli, 2013; Zaki & George, 2021). It also highlighted the influence of multilevel governance structures on the agility of crisis responses, and policy outcomes (e.g., Pattyn et al., 2020; Maggetti, 2020). While these structures are often associated with higher agility and scalability, they are also associated with coordination and alignment challenges especially during crises (Maggetti & Trein, 2018; Kettl, 2020). An issue that was highly visible in the COVID-19 context (e.g., Schomaker et al., 2021; Boin & Lodge, 2021; Capano & Lippi, 2021).

Consistently, learning is expected to take place across the different levels of the governance architecture. For example, within such crises, federal or central government officials can engage in policy learning (e.g., from experts) through interactions with dedicated national level expert advisory groups and use their learning to issue national directives. This is highly expected, given

that crisis governance often starts at the central level (e.g., see Kuhlmann et al., 2021). However, given the crisis' large scale and extended period, crisis governance and policymaking can gradually tilt towards the subnational levels (e.g., see the arguments by Maggetti & Trein, 2018; Maggetti, 2020). There, subnational policy actors also have access to their own expert groups, as well the policymaking leeway to implement their own lessons learned. However, how learning takes place across these different levels, and how different approaches to learning affect the uptake of national directives, and subnational policymaking remains largely underexplored.

Pursuing this inquiry is valuable, both for research and practice. Within such creeping crises contexts (e.g., the recent COVID-19 pandemic), policymakers engage in systematic policy learning processes, mostly focused on epistemic policy learning (see Dunlop & Radaelli, 2013; Baekkeskov & Öberg, 2016). The "intense" and systematic nature of this process is driven by inherent crisis complexity, perpetuity, and continuous policy issue evolutions which necessitate ongoing and structured learning (see Dunlop & Radaelli, 2013; Boin et al., 2020; Authors, forthcoming). This can be different from non-crisis contexts where there is relatively less pressure for learning, prompt action, and higher tolerance for faults or delayed responses (Van Dooren & Noordegraaf, 2020). Crisis complexity, urgency, and severity often leads to a rapid and high uptake of learning outcomes into policymaking, often entailing substantial implications for policy outcomes. These policy learning processes are highly sensitive to the governance structures in which they occur (e.g., Pattyn et al., 2020). Features of these structures (e.g., decentralization, coordination, fragmentation) can foster or inhibit learning, and shape its outcomes (Zaki, Wayenberg & George, 2022). This is particularly as decentralized and multilevel governance architectures boast varying politico-administrative traditions, competences and degrees of control

known to influence how learning takes place (e.g., Dunlop & Radaelli, 2013; Di Giulio & Vecchi, 2018).

Put together: such creeping crises necessitate and amplify the role of epistemic policy learning, said learning happens within decentralized governance architectures that influence how learning takes place. However, little is known on how this happens. Hence, in this article, using the case of the COVID-19 crisis, we explore the hitherto under-researched, question of *how does epistemic policy learning take place across different levels of the multilevel governance architecture during creeping crises?* To answer this question, we trace one of the most omnipresent type of policy learning within such crises, that is learning epistemic policy learning or learning from experts (Dunlop & Radaelli, 2013; Zaki & George, 2021). In doing so, we do not imply that other types of learning do not exist (or are muted) within the COVID-19 crisis. Rather, given the exploratory nature of this research, and scarcity of existing research on the issue, we elect to focus a relatively more pronounced and traceable type of learning to enable more robust analysis.

To do so, we conduct an exploratory case study (Greenfield & Natalia, 2022), using an instrumental cross-unit case study approach, i.e., identifying a case highly suitable for exploring the phenomenon of interest. We use the Belgian highly pronounced multilevel governance architecture as an empirical setting. Belgium boasts a range of politico administrative traditions, and ethno-linguistic cleavages that allows us to explore a range of valuable within-case variations (see Valcke et al., 2008; Pattyn et al., 2019; Pattyn et al., 2020). We source data from 46 official documents, and media coverage supplemented by 13 high-level interviews with policymakers and experts. Our analysis aims at giving exploratory account of how policymakers approached epistemic policy learning across the three key governance levels involved in the Belgian COVID-19 crisis response: national (federal) and subnational (provincial and municipal).

The contribution of this article is threefold. *Theoretically*, while learning literature often strives to explain when and how learning leads to policy change, this relationship is often challenging to explain (Borrás, 2011). By exploring variations in how learning takes place across different governance tiers, we heed the call for a more multidimensional understanding of how learning takes place, and its potential contribution to policy change (Dunlop & Radaelli, 2017). This is through creating a better account of the microfoundations of learning and the key elements involved in the learning process, i.e., how actors approach learning within different governance structures, using varying information and knowledge sources (see Kamkhaji & Radaelli, 2017; Zaki, Wayenberg & George, 2022). Understanding how different governance tiers learn, offers a more nuanced explanation of why and how they adjust their policy responses, and why policy trajectories at the subnational levels can diverge or converge. Second, *empirically,* by offering a novel account of an under researched phenomenon, this exploratory case study provides future research with testable key factors that influence policy learning across levels of government Third, *practically*, we leverage our findings to reflect on how policymakers can enhance the design and management of policy learning frameworks within crisis contexts.

This article proceeds as follows: In section two, we explore the nexus of policy learning and multilevel governance and establish the mode, type, and mechanism of policy learning observable within the COVID-19 crisis. In section three, the methodological and analytical frameworks are constructed. In section four, we present our case. We offer our discussion and conclusions in section five.

2. Creeping crises, policy learning and multilevel governance

The manner by which policy learning takes place is highly influenced by the context surrounding the learning process. As such, different parameters of the context (e.g., urgency,

shock, issue complexity) can lead to different mechanisms, modes, and types of learning to take place. These varying ways by which learning takes place entail different operationalization, and empirical identification schemes. Hence, before appraising learning within a certain case, it is necessary to ex-ante theorize how is learning expected within a certain context. This helps us establish and exclude the null hypothesis (i.e., the non-learning condition), and exclude potentially confounding learning-like phenomena (Radaelli, 2009; Zaki, Wayenberg, & George, 2022; Author 1, forthcoming). In this section we begin by demarcating the *context* of policy learning and consequently, what *mechanisms*, and *modes* of learning it invokes. Then we establish the plausibility of these learning processes taking place across different tiers of the multilevel governance architecture.

The COVID-19 crisis: Context, mechanism, and mode of learning

Learning mechanism

Boin et al. (2020) conceptualize COVID-19 as a creeping crisis. Policymakers can see these crises coming a mile away. However, they do not necessarily dedicate them sufficient early-on attention. This is in contrast to fast-burning or one-time shock crises that invoke concerted consensual urgent action. Creeping crises are *Transboundary*. Hence, they are "fuzzy", challenging to define, they permeate societal and sectorial boundaries (Zaki & George, 2021), and demonstrate *variations* in intensity, i.e., "occasional sparking". Consequently, they lead to divisive threat perceptions, and create space for *political contestation* (Authors, forthcoming). Temporally, these crises are *epochal*, and present a sense of *permanence* as they manifest over extended periods. Thus, they require policymakers to establish long-term crisis-specific policymaking paradigms or "new normals", i.e., cognitive scripts for understanding the world throughout

8

extended crisis periods (Authors, forthcoming). With this context in mind, what policy learning mechanism takes place?

Learning literature draws distinctions between two mechanisms by which learning occurs: *contingent* and *inferential* (Kamkhaji & Radaelli, 2017). Contingent learning occurs where crises induce shock and urgency, pushing policymakers to act quickly aiming to avoid harm. They draw rapid "cue-outcome associations" leading to significant policy change, yet without an inferential (critical) reflection on -or revisions of- beliefs and priors. Ceteris paribus, under this mechanism, policy change happens, then critical reflections on priors ensue. Inferential learning on the other hand, often first involves genuine critical reflections on priors leading to updates in policy beliefs then potentially followed by belief or policy changes (e.g., Heclo, 1974; Bennett & Howlett, 1992; Kamkhaji & Radaelli, 2017). Inferential learning as such happens when policy actors consume and critically reflect on policy related information and knowledge, often aided by knowledge production mechanisms and sensemaking capacities, the existence of learning structures (see Rietig & Perkins, 2017; Zaki, Wayenberg & George, 2021). Conversely, contingent learning is enabled by: *absence of institutional and epistemic entrepreneurship, limited cognitive and sensemaking capacities, Crisis induced shock, fragmentation, or lack of jurisdictional authority* (see Kamkhaji & Radaelli, 2017).

Looking at a two-year horizon in our analysis, COVID-19 policy learning research has shown that the crisis provides the space for inferential learning to occur (e.g., see Ladi & Tsarouhas, 2020; Zaki & Wayenberg, 2021). There was a clear presence of expert communities in different capacities acting as producers of scientific knowledge with access to policymakers through formalized learning structures (Pattyn et al., 2020; Zaki & George, 2021). There was also substantial institutional entrepreneurship proffered by local and international specialized bodies

(e.g., Sciensano[i], WHO, EMA). Furthermore, the epochal nature and interspersing intensity of the creeping crisis has availed significant room for the deliberate and critical reflection within the policymaking process, thus at this level of analysis neutralizing the one-time shock effect, enabling foresight and critical reflection (Authors, forthcoming).

Put together, within the purview of our case, this creates space for inferential, rather than contingent learning. However, this does not exclude that contingent learning mechanisms can occur within other contexts. For example, when looking at different levels, or timeframes of analysis, varying actor constructions of the crisis, and political motivated crisis responses (e.g., Bergeron et al., 2020; Ladi & Tsarouhas, 2020). Next, we home in on which specific mode of inferential learning that prominently features within this analytical context

Learning mode: COVID-19 and Epistemic policy learning

Dunlop & Radaelli (2013) identify four main modes of learning: *Hierarchical*, *Epistemic*, *bargaining-oriented*, and *reflexive*. The functionality (i.e., suitability) of these learning modes is determined by two features of the policy issue: *Actor certification* (i.e., existence of socially endorsed groups that can act as "problem solvers") and *issue tractability* (i.e., degree of issue uncertainty). Given that COVID-19 is an issue of high certification of actors, and low issue tractability, epistemic policy learning is positioned as a highly functional learning mode (Zaki & Wayenberg, 2021). Epistemic policy learning is viewed as learning from certified groups of experts with substantive policy-issue knowledge and access to policymakers (Haas, 1992). Epistemic learning is also not unimodal. Epistemic actors can play different roles with varying degrees of influence based on a dynamic relationship with the learners as: *contributors*, *producers of standards*, *facilitators*, or *teachers[1]*. These positions are also largely determined by a

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[1] Similar to epistemic policy learning other modes also involve different mechanisms based on learners' control over learning means and ends (Dunlop & Radaelli, 2013). For example, within reflexive learning, learning can happen

combination of two key factors, pertinent to: learners' control over: *learning content* (i.e., means), and *learning objectives* (i.e., ends). For example, when policymakers (learners) have limited control over the objectives and means of learning (e.g., facing technical complexity and public pressure), epistemic communities can take a more compelling "teacher" position and hold significant sway in defining interests, outlining lessons, and charting potential solutions. In contrast, when policymakers have control over learning means and outcomes, epistemic actors can be relegated to "contributors" as policymakers have more space to: define their own agendas, contest inputs, and reshuffle epistemic communities when needed (e.g., Dunlop, 2017a; Zaki & Wayenberg, 2021).

While epistemic policy learning can be enlightening, undertaking it is onerous. Misdirected learning can engender policy failure and derail policy (e.g., Dunlop, 2017b). Lapses in epistemic policy learning leading to sub-par outcomes can be attributed to several factors, including: mismanaged relationships with epistemic communities (e.g., Dunlop, 2017a), epistemic entrenchments, the identification of expertise, the influence of institutional legacies on management of policy learning processes (e.g., Zaki & Wayenberg, 2021), and the politicization of expertise (e.g., Dunlop, 2017b).

So, we have a creeping crisis, that -within our analytical context- invokes inferential learning, and where epistemic policy learning processes is at the forefront of policymaking. Next, we explore the theoretical nexus of multilevel governance and epistemic policy learning within the COVID-19 crisis context.

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deliberatively, experimentally, framing-oriented, or evolutionary. In hierarchy-oriented learning, learning can happen with autonomy, instrumentally, through delegation, or is hetero-directed.

Epistemic policy learning and multilevel governance

Literature explores how epistemic policy learning takes place from different perspectives, commonly temporal or policy-issue specific. For example, looking at how the roles of epistemic communities vary over time, as functions of: knowledge production and dissemination (e.g., Dunlop, 2017), perturbations in the policymaking context, and evolving policy issue perceptions (e.g., Authors, forthcoming; Zaki & Wayenberg, 2021). However, the spatial perspective on how policy learning (particularly epistemic) takes place, i.e., its geographical and governance level dispersion, has been rarely explored (see Mavrot & Sager, 2018; Neij & Heiskanen, 2021). This is despite knowing that: problem-solving through learning and multilevel governance arrangements being inherently entwined (see Maggetti & Trein, 2018), and that policy learning cannot be understood in separation from the structures in which they take place (e.g., Pattyn et al., 2021; Bomberg, 2007).

Multileveled, and decentralized governance architectures are globally prevalent and play central roles in directing crisis responses. They also shape (empower or impede) policy responses, particularly during large-scale crises where the need for continuous adaptation is key (e.g., Boin & Lodge, 2021; Capano & Lippi, 2021). Major crisis responses often start at the central level, however, as a crisis continues, they gradually shift into more decentralized forms (see Kuhlmann et al., 2021). This is as policymakers attempt responding to challenges beyond the full reach of central governments (Maggetti & Trein, 2018). Coordinated decentralisation can allow for swift and localised responses that account for local specificities (e.g., Schomaker et al., 2021). However, decentralized systems have also been associated with a range of coordination challenges leading to fragmented and siloed crisis responses.

Yet, why would we expect learning processes to show potentially diverging patterns or behaviours across different levels? Literature shows that learning processes are influenced (catalysed, impeded or just simply shaped) by key factors that naturally vary across different governance levels. For example, learners' control over the learning process can change how they engage in learning, and how they interact with expert communities (e.g., Dunlop & Radaelli, 2013). Also, learning capacities, politico administrative traditions, and political legacies can affect approaches to learning (e.g., Di Giulio & Vecchi , 2018; Zaki, Wayenberg & George, 2022). This naturally becomes more pronounced in countries with wider degrees of ethno-linguistic and political traditions at the subnational levels, for example such as Belgium (see Authors, forthcoming).

So, we have earlier identified epistemic policy learning as a central learning type within the COVID-19 crisis context. Now, we highlight why within this context, epistemic policy learning processes plausibly occur at different levels of the governance architecture. We put forward two main logics pertinent to the *nature of COVID-19 as a creeping crisis*.

First, COVID-19 is a large-scale crisis. Unfolding for over two years, the COVID-19 crisis has an epochal and persistent nature. It is also transboundary, as such it cuts through different sectors, and communities. It is socially and behaviourally moderated, its evolutions and outcomes are shaped by local norms and cultures (Cao, Li, & Liu , 2020). Hence, managing the crisis needs to sustain consistent and long-term engagement with community and region-specific features, such as those concerning trust in government, economic conditions, and local capacities among several others (e.g., Suppressed references; Capano & Lippi, 2021), while harmonizing policies with national strategies (see Bosa, et al., 2021). Accordingly, subnational governments need to

customize or "tailor" responses to their regional and local contexts and capacities, often yielding potentially varying and context-sensitive approaches to managing the crisis.

Second, being a technically complex policy issue, the knowledge underlying crisis response is highly specialized, and often expert-driven. Accordingly, policymakers at different levels of the governance architecture need to employ professional "sensemakers" to: 1) Interpret and elaborate on national crisis strategies 2) Customize these strategies to fit subnational contexts, especially in countries with significant subnational cultural, and politico-administrative cleavages exist (e.g., Valcke et al., 2008; Pattyn et al., 2021). This becomes particularly important as subnational governments attempt to utilize the "leeway" on policy adjustment and implementation created by national-subnational coordination mechanisms (see Maggetti, 2020). Consistently, findings from multilevel governance research emphasizing that -around technically complex issues- subnational policymakers construct their own localized sensemaking groups to understand, contextualize, and implement national policies through engaging with epistemic actors (e.g., Neij & Heiskanen, 2021). There, localized policy learning processes can provide knowledge "at key entry points" and improve policy suitability (Mavrot & Sager, 2018; Di Giulio & Vecchi, 2018), by leveraging situated knowledge, leading to better sensemaking and problem-solving capacities (e.g., Leino & Peltomaa, 2012). Put together, the plausibility of policy learning occurring across multiple levels of the governance architecture is evidenced in extant literature (e.g., Di Giulio & Vecchi , 2018; Mavrot & Sager, 2018), burgeoning COVID-19 literature (e.g., Casula & Pazos-Vidal, 2021; Mattei & Del Pino, 2021) as well as the interactions between subnational actors and expert groups at their respective levels.

Hence, given our analytical context, we have a situation where policymakers engage in inferential learning (particularly epistemic), at different levels of the governance architecture. In

the next section, we construct our analytical and methodological frameworks to explore how said

processes of epistemic policy learning take place across the national, subnational (provincial), and

local (municipal) using a case of the Belgian COVID-19 response.

3. Methodological Framework

3.1 Case Design

To conduct our exploratory case analysis, we employ an embedded case study design with

multiple units of analysis. This enables an exploration of complex empirical cases (Nowell &

Albrecht, 2018). Since we focus on multilevel governance structures, we use an "across and

within-unit" cross sectional approach. This allows us to examine variations of different subsystems

analytical units) within a common larger structure (Gerring, 2004). Case selection is instrumental,

we identify a case best suited to offer insights into the phenomenon of interest. Selecting Belgium

was motivated by three main logics. *First*, the country's established (and often perceived as

complex) multilevel governance setting with emphasized central-local relationships and its

conventionally dense advisory system (Happaerts, 2015; Fobé et al., 2013; Valcke et al., 2008).

Second, Belgium's relatively diverse, and geographically dispersed clusters of scientific expertise

and advisory structures (Pattyn et al., 2019). *Third*, that Belgium's initial COVID-19 has been

subject to controversy, particularly given issues in response coordination, epidemiological

conditions, legitimacy, and expertise (Zaki & Wayenberg, 2021; Popelier, 2020). This avails

opportunities for tracing pathways between different approaches to epistemic policy learning,

adjustments of policy trajectories, and policy outcomes. Our observational timeframe is the two-

year period between January 2020 and December 2021. This allows us to trace variations in

learning processes as the crisis response scheme has moved between federal and decentralized.

Hence, gives us a better understanding of the consistency by which learning was approached throughout the crisis.

3.2 Data

We employ data source triangulation by collecting data 46 official documents (including advisory group reports, documents from parliamentary depositions and public statements), and media coverage[2]. The primary use of documentary analysis and desk research supplemented by interviews is a highly effective and recognized approach in the policy learning methodological tradition that enables tracing the "how" of learning takes place (e.g., Kamkhaji & Radaelli, 2017; Cairney, 2021; Zaki, Wayenberg & George, 2022). This is supplemented by 13 high-level key informant interviews (4 provincial governor cabinets, 2 municipal cabinets, 7 senior experts involved in policy advisory bodies, and a national institution leading the government's response)[3].

3.3 Analysis

The precise phenomenon we are interested in observing is how epistemic policy learning takes place across different levels of the governance architecture. In other words, how did different government levels learn or update their understandings of the policy issue through interacting with expert communities. To structure our analysis, we use a background conceptualisation of policy learning. Background conceptualisations allow us to capture key analytical dimensions. Along with Haas's (1992) definition of epistemic policy learning, at a background level, we view policy learning as a process of continuous interaction between *actors*, *systems, and structures*, around policy related *information and knowledge* within a policymaking *context* (Zaki, Wayenberg &

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[2] Triangulation was primarily conducted by cross-verification of inputs from different interviews (insights from experts, provincial and municipal officials) and documentary analysis.

[3] All ten provincial cabinets were contacted, 4 have returned the invitation for interviews. 3 municipal cabinets with major scientific/ academic institutes were contacted, 2 have returned the invitation for interviews.

George, 2022). In our analysis, expert communities and epistemic actors are advisory groups (i.e., those existing within learning structures) or experts affiliated with scientific groups (e.g., universities, scientific and research institutes). These groups were abductively identified through both document analysis and interview data. In analysing data, we followed an abductive approach (see Tavory & Timmermans, 2012), focusing on our key analytical dimensions (process of learning, knowledge and information, structures, actors) across the three governance levels. In doing so, presenting a thick description of the policy learning process as per the policy learning methodological tradition (see Zaki, Wayenberg & George, 2022). In table 1, we highlight how the background conceptualization informs the analytical foci of our case.

Learning Process Dimension	Analytical Focus
Actors	- Policymakers and expert groups at the federal and subnational levels.
Information and Knowledge	- Knowledge and informational content generated by different expert groups and policymakers across different levels.
Systems and structures	- Epistemic advisory structures (e.g., Crisis cells, expert groups, etc.). - Governance structures (Federal, provincial, and municipal).
Context	- COVID-19 as a creeping crisis, over two years from early 2020 to late 2021.
Policy issue	- COVID-19 as a societally embedded, large-scale crisis.
Process of learning	- Key features of the process: Systematic versus non-systematic

Table 1: Analytical foci based on Zaki, Wayenberg, and George (2022) & Haas (1992)

Interview data was anonymized and coded along with documents on NVivo using qualitative content analysis. Coding frames were abductively developed in close connection to the research design (see Nowell & Albrecht, 2018). Consistent with the background conceptualization used, we primarily coded for the occurrence of epistemic policy learning, and the "how" dimension which accounts for: Advisory structures engaged, knowledge and information leveraged, key

actors involved, and the patterns of information consumption (systematic/non-systematic). In our discussion, we then draw on two typologies of policy learning to position how the identified epistemic actors were involved in the learning process (Dunlop & Radaelli, 2013), and the disciplinarity of the underlying knowledge and informational content involved (Zaki & Wayenberg, 2021).

In the next section, we present our case study. We begin by highlighting the regional and local specificities underlying COVID-19 evolutions, then proceed to account for how epistemic policy learning took place across the national and subnational levels.

4. Case Description

National Situation and Subnational Variations

Covid-19 kicked off to a drastic start in Belgium. Initially, the country had one of the world's highest infection and mortality rates per capita. The government partially attributed this to "diligent counting" while acknowledging shortcomings in initial pandemic response (Zaki & Wayenberg, 2021). Structurally, Belgium has pronounced ethno-linguistic divides, varying politico-administrative traditions, value perceptions, and cultural cleavages (Pattyn et al., 2021). These divides are between two main regions: Flemish (Dutch speaking) and Walloon (French speaking)[ii]. Each of these regions comprises several provinces with each province comprising several municipalities (De Ceuninck et al., 2010). The spread of COVID-19 is moderated by societal, cultural, and structural factors. Hence, subnational epidemiological variations were evident across regions, also across provinces and municipalities within the same regions (Clapson, 2021; Sciensano, 2021). Regionally (on the Flemish-Walloon level), perceptions of the virus, circulation and what needs to be done were seen quite differently where it was "*Same country, same system, same laws, same regulations yet there were sometimes very different views in the*

18

public opinion" (INT3-E). Even within one region, one example was the city of Antwerp which had an exceptionally large cluster of infections that necessitated localised lockdowns in the summer of 2020, being on a substantially different epidemiological trajectory from other Belgian cities at the time (Zaki & Wayenberg, 2021). Other examples of within-country variations were observable in the different attitudes towards vaccinations and pandemic restrictions (e.g., Walker, 2021) as highlighted in Table 2.

Region	Fully Vaccinated[4]	Confirmed Cases (Per 1000)[5]	Confirmed Deaths (Per 1,000)
Brussels Capital Region	45%	118.89	2.72
Flanders	69%	81.92	1.93
Wallonia	62%	119.99	2.53

Table 2 here: Regional variations in epidemiological conditions

In the next section, we present an exploratory account of how -within this heterogenous context- each of the key governance levels approached policy learning. We focus on the key dimensions from our analytical framework of the learning process: Advisory structures, actors involved, information and knowledge content. We start at the federal level.

Federal Level learning

With the crisis being federally managed, the Belgian government initially established 14 national crisis response and expert advisory structures, later known as the "COVID-19 Labyrinth" (Zaki & Wayenberg, 2021; INT3-E; INT5-G[6]). This led to significant leadership and coordination issues that were considered "fatal" (Van Overbeke & Stadig, 2020). The two main technical bodies tasked with advising government were the then newly established GEMS group (replacing the expert evaluation cell CELEVAL), and the more technically specialised Risk Assessment Group

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[4] Source: https://covid-vaccinatie.be/en as of the 11th of August 2021.

[5] Sources: Cases and Death stats: Official Sciensano Data https://epistat.wiv-isp.be/covid/ as of the 9th of August 2021.

[6] INT: Interview data. G: Provincial level, E: Experts, M: Municipal level.

(RAG), a permanent group within Sciensano, Belgium's main Public Health advisory body (Belgian Government, 2021). In terms of expert actors involved within these groups, as many others CELEVAL (which was later deactivated) was mostly comprised of virologists and epidemiologists with an under-representation of sociological and behavioural experts (Zaki & Wayenberg, 2021; INT4-E). This issue persisted (albeit with less severity) in the case of GEMS and RAG (GEMS, 2020b; INT3-E). The logic of expert recruitment was to identify relevant expertise or as interviewee expressed "expertise is where it is", rather than localize learning or craft regionally representative advisory structures. Resultantly, the advisors' line-up tilted towards a geographical overrepresentation of Flemish-based experts (GEMS, 2020b; The Brussels Times, 2020). This led to a perception among experts and the public that one region's view "overpowered the other", casting some legitimacy concerns over the learning process (INT3-E). Given that in a country like Belgium "it is hard to govern by imbalance" the formation of these groups was later adjusted to create a more regionally balanced structure (INT3-E). This was found to be consistent with evidence on differences between how the two main Belgian regions and federal authorities have viewed the pandemic (e.g., Chini, 2021; The Brussels Times, 2020; Walker, 2021b), particularly given the underlying subnational variations described by Pattyn et al. (2021).

In terms of the knowledge and informational content, analysis of reports produced by the two main technical advisory bodies (Fourteen reports from GEMS and twenty-two from RAG) consistently demonstrated limited regional contextualization of learning. For example, GEMS recommendations on nursing homes, telework, epidemiological thresholds, and contact tracing remain almost exclusively at the national level with limited localisation of insights (e.g., Belgian Government, No Date; GEMS, 2021a). Consistently, recommendations from RAG reflected regional granularity only when alarming spikes in epidemiological indicators are detected (i.e.,

clusters of infections, hospitalisation, and intensive care occupancy, etc.). This did not include localised advice on what to do, or accounts on socio-economic or behavioural aspects in different regions. However, some medical experts at federal advisory bodies still occasionally provided insights on developments in their own local communities in committee meetings given that they *"had their fingers on the pulse"* (INT1-E; INT3-E). This was however limited to epidemiological evolutions and conditions in critical healthcare facilities. It also remained non-systematic and on adhoc basis.

At the federal level, the policy learning processes therein were highly systematised and formalized. This included codified roles and task descriptions and strong involvement of (predominantly) medical experts e.g., RAG, CELEVAL, GEMS, GEES (INT2-M; INT3-E). There were regular public updates, with established reporting standards. Large-scale changes in advisory bodies were pronounced and often explained through both official and non-official channels (e.g., Zaki & Wayenberg, 2021; The Brussels Times, 2020b). This learning systematism was also reflected in experts playing a significant role in shaping crisis policymaking as well as directly addressing the public, sometimes on behalf of the government.

Next, we move one step down to explore how epistemic policy learning was approached at the provincial level.

Provincial level learning

Our analysis at the provincial level is consistent with findings from the federal level. Interviews with provincial officials show that federal level guidance was relatively generic, and was thus "interpreted differently", sometimes leading to "confusion" (INT5-G; INT3-E). This concern was echoed in calls from subnational authorities for clearer information and more precise courses of action (Moens, 2020). This generic guidance interacted with a highly uncoordinated

subnational governance structures. There, coordination challenges where exacerbated. Belgium had nine health ministers spanning different regional jurisdictions at the subnational level (Pattyn et al., 2021). This resulted in fragmentation of competences and relatively divergent approaches to combatting the pandemic (Van Overbeke & Stadig, 2020). The few evident aspects of local specificity (as perceived by the provincial government officials) seemed to be only in terms of epidemiological updates (e.g., case counts, viral reproduction rates). At this level, it was up to provincial governors to steer the epistemic policy learning process or even decide if they want to have one.

Governors are considered executive officials appointed by the regional governments (e.g., Flemish and Walloon). Their roles include directing policy formulation, implementation, and provincial crisis responses (see Valcke et al. 2008). Consequently, variations in subnational approaches to learning were evidence. Our analysis shows three main modalities by which provinces engaged in epistemic policy learning.

The first modality entailed intensive engagement with a relatively wide range of scientific experts. Some governors formed their own advisory structures, reached out to personal contacts and individual experts for consultation (INT1-E; INT5-G; INT6-G). This was next to interactions across municipalities with the permanent pre-established provincial crisis cells (e.g., see National Crisis Center, No Date). These relatively generic expert cells exist on both regional and the local levels and include professionals from various fields known as the "disciplines" (e.g., police force, fire brigadiers, logistics specialists, doctors, emergency planners, etc.). They often produced domain specific and siloed information and knowledge. *The second modality* entailed minimal engagement with expertise in general or in local expert communities (either from universities or experts within the permanent provincial crisis cells). As such, some provinces relied almost

exclusively on the pre-established provincial crisis cells for interpretation and implementation of national policy guidance (INT6-G). *The Third modality* involved a hybrid approach. Governors alternated between learning from their crisis cells on one hand, and inter-provincial collaborations with other governors who engage with - and have access to- scientific experts within their own provinces, on the other. This was particularly salient in provinces where governors did not have strong existing collaborations with expert communities (or major university/research hubs). Across these three approaches, interactions with experts were largely systematized, mainly given protocols for holding regular meetings with provincial crisis cells (INT5-G; INT6-G). However, the learning structures and the actors therein largely varied.

While in all cases governors perceived their general role as "go-between-ers" linking federal and municipal levels (INT5-G; INT6-G), two key factors seemed to influence their specific approaches to policy learning: perceptions of roles and past professional experiences. Some governors disidentified with being experts (or even policymakers) stating "I do not need to be an expert, I need to be a generalist who has sufficient knowledge and expertise of the team to be able to do my job, and so, I felt that was enough" (INT6-G), while others identified more with the "policymaker" and the "expert" role and hence felt responsible for learning and disseminating sensible information to municipalities (INT5-G; INT6-G). While significant variations in the role perceptions of governors might be surprising, it is not alien to the Belgian case where there is little consensus on the roles, profiles, and expectations from governors (see Valcke et al., 2008). As for the second factor, governors from academic or scientific backgrounds seemed to form closer connections and engaged more proactively with expert communities, particularly drawing on their pre-existing personal networks. For example, Antwerp's governor's former academic affiliation and networks seemed to foster more engagement with expert groups where intensive epistemic

policy learning interactions took place. This helped address emerging clusters of infections within certain local communities and synthesize solutions for provincial outbreaks (INT3-E; INT5-G). It also led to critical sensemaking and contextualisation of policy advice from several layers of experts at the federal or regional levels (see Province of Antwerp, 2020). On the other hand, governors coming from different backgrounds (e.g., former mayors or civil servants) tended to rely on pre-established crisis cells within the civil service (INT6-G). These findings are consistent with emerging research on the role of sectoral identities and their influence on policy preferences and action (e.g., Hornung et al., 2019).

This leads us to our next inquiry into how municipal officials engaged in epistemic policy learning within the same crisis context.

Municipal Level: citizen expectations and learning

With relatively limited coordination and a lack of a common approach to handling the pandemic, municipal action also diverged, even sometimes contradicted (e.g., Het Laatste Nieuws, 2020). Consistently, approaches to engaging in epistemic policy learning also varied municipally (INT2-M). For example, Leuven, a city with a significant student population, and one of the highest-ranking Universities in Belgium, augmented their municipal crisis cells by engaging with local university experts early-on. This helped the city spring to action, closing markets, and schools in the period where the federal government's guidance was not yet available. The city also worked with local experts to provide guidance on public health practices, even before national directives were announced. Collaborations with local experts were also undertaken to enhance the city's critical testing strategy and capacity, and process engineer vaccination rollouts (KU Leuven, 2020; INT2-M). The city government's response to the demographic structure, and citizens' expectancy seemed to catalyse engagement with epistemic communities where senior officials indicated the

population *"expects us to take scientifically responsible action"* (INT2-M) . This came consistent with the city's culture of scientific decision making and innovation, particularly during the crisis (e.g., Hope, 2020). Collaborations with epistemic communities at the municipal level were mainly a result of individual initiatives by some municipal governments, rather than pre-established institutional structures identifiable across municipalities (INT1-E; INT2-M; INT3-E; INT4-E).

Other city governments felt relatively less compelled to engage in epistemic policy learning processes, also seemingly catalysed by their populations' expectancy, where another city senior official said, *"our citizens expect us to take reasonable decisions"* (INT2-M), while arguing for less drastic lockdown measures. Across both approaches to epistemic policy learning, municipal government officials have emphasized the need for regional and local specificities to be considered in decision-making (e.g., business closures, lockdowns, etc.), an issue municipalities argued was not sufficiently considered by federal government. At this level, we find that the learning process presented as relatively less structured or systematized (i.e., adhoc). Whenever learning took place, the knowledge content was mostly focused on the core issue at hand (medical and epidemiological).

With that said, our account of policy learning processes across the federal, provincial levels shows diverging approaches to engaging in policy learning. In the next section we synthesize an answer to this article's central research question, followed by the implications of these findings for theory and practice.

5. Discussion

In our analysis, we offered an exploratory account of how epistemic policy learning took place at different levels of the Belgian multilevel architecture. This analysis does not primarily aim to identify an exhaustive set of approaches to engaging in policy learning, particularly given

inherent limitation on available data. Rather, it focused on identifying key features of the learning process across different levels. In this section, we draw on our findings to synthesize an answer to our central research question, followed by a discussion of the key implications for research and practice.

How does epistemic policy learning take place across different levels of the multilevel governance architecture?

Federal level advisory bodies had regular interactions and have grown more coordinated as opposed to the beginning of the pandemic. Steady government action and appointment of a "Corona Commissioner" in October 2020 improved coordination (INT3-E). While crisis governance often has a central locus (particularly at initial crisis response), as the crisis unfolds, decentralized architectures play increasingly important roles (e.g., Kuhlmann et al., 2021). Here, Belgium's complex institutional setting have clearly contributed to significant fragmentation and coordination issues (Pattyn et al., 2020). Consistently, this affected how policy learning took place. With the crisis being officially managed at the federal level, there was significant accountability and public pressure on the federal government. This resulted in reduced learner control over the objectives and content of the policy learning process (see Dunlop & Radaelli, 2013). Thus, the federal government was compelled to systematise, institutionalise, and structure the policy learning process. While seeking to identify expertise, the regional representativeness of expert actors was compromised, undermining the legitimacy of the learning process. This was later addressed by regaining regional balance in expert committees, aiming to increase perceived legitimacy of learning outcomes (i.e., policy recommendations). In doing so, advancing the acceptance of COVID-19 policies through securing the buy-in of experts from different regions which indicates a form of political learning as described by Heclo (1974).

Provincially, non-elected officials had higher control over learning objectives and content given that the crisis was mainly under federal management. Three main modalities of learning emerged from our data: *Intensive*, *midrange cross-jurisdictional*, to *minimal*. Ceteris paribus, given that the degree of learner's control over the objectives and content of the learning process was almost constant at the provincial level, approaches to policy learning were seemingly influenced by two key factors. *First*, background and personal experience of provincial leaders (e.g., in some cases, governors from academic backgrounds being more inclined towards intensive epistemic deliberations while those for example from civil service backgrounds being relatively less inclined to do so). *Second*, personal role perceptions. While some governors identified with their roles as policymakers responsible for aligning stakeholders (mayors, citizens, etc.) with evidence-based action, others disidentified with such roles saying, *"I am not a policymaker, I am a civil servant"* or *"I do not need to be an expert on everything"*. These variations were amplified by the role-ambiguity of governors and provincial governments in the Belgian system (see Valcke et al., 2008).

Municipally, elected officials were influenced by the accountability to their publics, yet also more control over the learning process (again, given that all eyes were on the federal level). There, engagement with experts seemed to be somewhat reflective of the population's expectancy. While some municipal leaders intensively engaged with a wide range of local epistemic actors (university experts or local crisis cells) as their citizens "… expect that they take scientific decisions", others were more restrained and in line with their citizen's expectations where the public pushed back for less drastic measures expecting "more reasonable" decisions.

To position our findings within the broader policy learning debate, we draw on two frameworks/typologies: Dunlop & Radaelli's (2013) genera of learning that allows us to position

the roles of epistemic actors in the learning process as *contributors*, *facilitators*, *producers* of *standards*, or *teachers*, and Zaki & Wayenberg's (2021) framework of epistemic policy learning inclusiveness. Additionally, we offer a description of the policy learning process by showcasing to what extent it was systematic, institutionalized, and coordinated across different levels (Table 3).

Epistemic Policy Learning as	Federal Level (National) Lower Learner Control	Provincial Level (Subnational) High Learner Control	Municipal Level (Local) Higher Learner Control
An Institutionalised Practice	- Relatively Institutionalised. - Engagement of National Research Institutions.	- Mostly Individual. - Minor Collaboration in institutional forms.	- Mostly Individual. - Minor Collaboration in an institutional form.
A systematised Practice	- Systematic, periodic, and formalised.	- Adhoc, influenced by policymakers' role perceptions and orientations.	- Adhoc, influenced by the civil service's relationship with local clusters of experts.
A coordinated Practice	- Coordinated through established structures. - Varying yet clear inter-committee coordination.	- Relatively less coordinated - Contingent on policymakers' coordination abilities and networks.	- Relatively less coordinated. - Coordinated by individual policymakers.
Main outcomes	- Instrumental Learning (May, 1992) - Political Learning (Heclo, 1974)	- Instrumental Learning (May, 1992)	- Instrumental Learning (May, 1992)
Inclusiveness of Epistemic Policy Learning Processes	Relatively inter and intradisciplinary (Health and behavioural experts)	Highly focused on medical experts	
Role of Experts	- Teachers - Producers of standards	- Producers of standards - Facilitators - Contributors [Dependent on key policy actor preferences, role perceptions, and professional backgrounds]	

Table 3 here: Epistemic Policy Learning across multiple levels

The big picture: What did the crisis do to the policy learning process from a multilevel governance perspective?

Understanding the dynamics of policy learning as a key mechanism for policymaking and policy change within crises is ever pressing. Accounts of how learning takes place within these contexts need to consider the context of learning, its interaction with the policy issue, and structures in which it occurs. Accordingly, in this article we explored how policy learning took place, not only at different levels of the Belgian multilevel governance architecture, but also across different units within the same levels. Next, we leverage our findings to answer an important inquiry for theory and practice. That is, *how did COVID-19 shape the policy learning process from a multilevel governance perspective?*

Creeping crises are substantially different from one-time shock crisis events such as natural disasters for which there are standard crisis response and operating procedures (e.g., Boin & Lodge, 2021). Our findings show that the crisis broke down what would have otherwise been one overarching policy learning process into a set of smaller heterogenous processes across multiple levels. This is of course exacerbated by the existing complex institutional structure known to Belgium. Yet, why? And how? Here, three interlinked creeping crisis features come to the fore: *policy issue context sensitivity*, *scale*, and *duration*.

The crisis is highly *context sensitive*. Crisis policymaking needed to account for socio-economic, behavioural, and cultural contexts. It is also *large-scale*, i.e., global in nature, and transboundary, i.e., cuts across different sectors (Zaki & George, 2021). Hence, the COVID-19 crisis intersects with a range of subnational contexts and sectors (across different provinces and municipalities). The crisis is also dynamic in nature, i.e., it has several outbursts of varying intensity. In terms of *duration*, unfolding over more than two years, the manifestation and social construction of the policy issue also evolved over time, from an initially exclusive public health

issue to a complex socio-economic one (Authors, forthcoming). This diminished the effectiveness of "one size fits all" approaches to crisis policymaking. Accordingly, policymakers at different levels needed to continuously interpret, adjust often technically complex and generic policy guidance from the federal government to their local contexts.

This necessitated expert engagement through subnational policy learning processes. However, the absence of a common framework for policy learning rendered subnational learning processes visibly heterogenous. There, Dunlop & Radaelli's (2013) degrees of learner control over epistemic policy learning robustly predicts the existence of variations across levels. We clearly see more structure, systematization, and accountability at the federal level (where policymakers had less control over the learning process) as opposed to the subnational levels (where policymakers had more). This created a set of divergent policy learning processes driven by heterogenous "epistemic islands" across governance units.

So, what does this imply for theories of policy learning and policy change? Our findings show that within complex multilevel governance systems and during creeping crises, there is no monolithic policy learning process. Rather, there are several dispersed and context sensitive ones. Accordingly, theories aiming to account for the relationship between policy learning and policy change, need to consider the multilevelness of learning processes (e.g., Dunlop & Radaelli, 2017; Zaki, Wayenberg & George, 2022). Now, what does this imply for practice? Here, we offer two key recommendations towards enhancing policy learning across different levels within such contexts.

Bridging Epistemic Islands

Large-scale crises emphasize the value of decentralised policymaking and policy learning. However, their induced pressure often blurs the lines between decentralisation and fragmentation (e.g., Schomaker et al., 2021; McConnell & Stark, 2021). Decentralised systems with legacies of institutional complexity and heterogenous politico-administrative traditions such as Belgium can be more prone to fragmentation under crisis pressure (see Mei, 2020). This overlaps with existing complex policymaking and advisory structures that are already challenging to govern (e.g., see Valcke et al., 2008 Pattyn et al., 2020). Limited consistency, vertical and horizontal coordination of expert advisory mechanisms and policy learning processes can create heterogenous *"epistemic islands"*. In our findings, we see them as disconnected and relatively uncoordinated advisory structures across geographical regions. They have little to no common governance frameworks, thus they do not share a common formation rationale. Accordingly, they remain at diverging levels of disciplinarity and expertise, leading to diverging sensemaking and mean making frames (Zaki & Wayenberg, 2021; INT5-G). Critically, this influences understandings of policy problems, narratives, and public perceptions. This can lead to subnational jurisdictions ending on diverging (yet not necessarily contextually valid) crisis response pathways. Limited local context sensitivity can constrain policy responses' social fit legitimacy, and compliance (thus, effectiveness). Hence, practitioners might need to consider: First, an overarching and systematic approach to identifying and integrating expertise into the policy learning process across multiple levels. This can be vertically (along different levels) and horizontally (across different regions at the subnational levels). Second, given crisis complexity, utilizing boundary-spanning expertise or learning "managers" to coordinate disconnected islands into a network of coordinated advisory bodies. This needs to account for existing institutional legacies and politico-administrative traditions and

capacities. An issue that emphasizes the potential for integrating public administration experts in the design and coordination of policy learning solutions within complex settings.

Aligning structures, actors, knowledge, and information

Varying politico-administrative traditions, existence of multiple advisory bodies across different levels and exogenous crisis pressures can contribute to fragmentation and weakened crisis governance (e.g., Mei, 2020). Thus, for adequate learning governance, policymakers might need to consider a systems' thinking approach that accounts for the interactions between advisory structures, their outcomes (e.g., vis-a-vis features of informational content and socio-political embeddedness) and existing governance architectures. In part, this can be achieved through establishing institutional mechanisms to foster alignment between organisational and multilevel structures (see Carter & May, 2020). Additionally, heuristics across the governance architecture warrant consideration. Subnational decisionmakers (e.g., provincial governors and mayors) can have surprisingly varying role perceptions, particularly as role descriptions can become blurred or malleable during long-term crises. Such perceptions can be shaped by several factors including (but not limited to) the decision makers' own professional backgrounds and degrees of control over the learning process. This is congruent with our knowledge of how sectorial biases, beliefs, value perceptions, experiences and heuristics influence policymakers' interactions with scientific expertise (e.g., Heikkila et al., 2020; Hornung et al., 2019), particularly around novel non-structured issues (Hoppe, 2017). Thus, mapping the structural pathways that central level epistemic policy learning outcomes can take becomes critical for adequate learning governance and stakeholder alignment.

6. Conclusion

Our findings show that epistemic policy learning was varyingly employed across all different levels of the governance architecture during the COVID-19 crisis. These variations could be attributed to different degrees of policymakers' control over learning objectives and content as proposed by Dunlop & Radaelli (2013). Variations in said degrees of control between the national and subnational levels could be explained given the official designation of policy issue management (being at the federal level). Within the subnational realm (where decision-makers had high control over the learning process), these variations could be partly explained by the policymakers' role perceptions, professional backgrounds, and their local constituencies' expectancy. Our findings in this article also show that Dunlop & Radaelli's (2013) and Dunlop's (2017a) findings on shifts in epistemic communities' engagement modalities as a function of learner's degrees of control do not only hold valid over time (as knowledge becomes more public) but also across space.

In this article, we contributed to policy learning theory by exploring how policy learning takes place across multilevel governance systems and proposing potential explanatory parameters able to account for spatial variations in policy learning modalities. We also, provided insights to policymakers on how to strengthen policy learning processes during creeping crises across different levels in multilevel governance systems.

Finally, our findings should be considered preliminary and exploratory. While these findings are consistent with our theoretical expectations, we are certainly limited by the number of interviews due to the available set of officials, number of provinces, and municipalities with major scientific/research institutes. Hence, we do not aim to make generalizable statements or offer an exhaustive listing of policy learning modalities of factors shaping them. However, our preliminary

findings create space for a future research agenda. Here, we would like to outline three potentially valuable areas for future research. First, expanding the empirical base by exploring multiple cases in different contexts (e.g., different countries or types of crises). This can allow for exploring new modalities of learning, their determinants, as well as refine the ones we highlight. On this note, future research can also explore how variations that come with multi-level governance structures (e.g., administrative traditions, politics, levels of control, etc.) could help provide better explanations for policy learning processes. This is through offering a comparative vantage point of how learning takes place across varying units with different configurations and institutional features. Second, employing a range of methods to test the effects of microfoundational factors we explored on learning preferences and their intersections with policy actors being at different levels of control over the policy learning process (see Dunlop & Radaelli, 2013; Hornung et al., 2019). Third, at the nexus of knowledge, actors, learning structures and context, future research can look into how paradigms of crisis-specific sharing of responsibilities impact knowledge production patterns across different advisory bodies, and the extent to which this shapes crisis learning. Similarly, future research can also explore how expert knowledge produced at one level influences knowledge production at other levels, i.e., the interactions between multilevel knowledge production processes, and their effects. In the same direction, future research can explore how the disruptive impact of the crisis affects the paradigms underlying the identification of expertise and formation of expert advisory groups, within the Belgian system and elsewhere. In the future, this can utilize longitudinal analysis and historical research.

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[i] Sciensano is one of Belgium's main public health institutes in charge of coordinating COVID-19 policy advisory structures.

[ii] The Brussels capital region is the 3rd region