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Opinion Paper

Agile and adaptive governance in crisis response: Lessons from the COVID-19 pandemic



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ABSTRACT

Countries around the world have had to respond to the COVID-19 outbreak with limited information and confronting many uncertainties. Their ability to be agile and adaptive has been stressed, particularly in regard to the timing of policy measures, the level of decision centralization, the autonomy of decisions and the balance between change and stability. In this contribution we use our observations of responses to COVID-19 to reflect on agility and adaptive governance and provide tools to evaluate it after the dust has settled. Whereas agility relates mainly to the speed of response within given structures, adaptivity implies system-level changes throughout government. Existing institutional structures and tools can enable adaptivity and agility, which can be complementary approaches. However, agility sometimes conflicts with adaptability. Our analysis points to the paradoxical nature of adaptive governance. Indeed, successful adaptive governance calls for both decision speed and sound analysis, for both centralized and decentralized decision-making, for both innovation and bureaucracy, and both science and politics.

1. Responding to the COVID-19 pandemic

When COVID-19 hit, countries around the world had to respond at all levels of government hand in hand with society. Calls for different responses were heard from various domains, and the way issues were approached was different per domain. Governments took leadership, holding regular press conferences to inform the public. The virus outbreak brought a sense of urgency to adapt to fight the pandemic. The crisis put high demands on governments and demonstrated that governments can be agile and adaptive – even though public bodies are often criticized for lacking these very traits.

“Agile governance” is a concept coined in the field of software engineering, and later expanded to organizational studies (Overby, Bharadwaj, & Sambamurthy, 2006). It entails primarily working practices and methods that facilitate quick responses. Applied to software development, the idea is that if working software is released quickly the effects can be evaluated early and used for further improvements (Boehm, 2002). “Adaptive governance,” in contrast, refers to the ability to deal with complex societal issues involving many stakeholders, diverging interests and uncertainty about the actions to be taken; such as in climate-change induced community relocations (Bronen & Chapin, 2013). Adaptive governance originates from evolutionary theory and draws widely on the ideas from political economy, resource and

environmental economics, experimental economics, evolutionary game theory, organizational theory, ecology, systems theory, and complex systems science (Hatfield-Dodds, Nelson, & Cook, 2007). Adaptivity is essential when facing a major, disruptive change, such as the COVID-19 pandemic.

In responding to COVID-19, countries put adaptive governance into action within an astonishingly short time span. This offers a unique opportunity to learn about agility and adaptability. The lockdowns seem to have worked, as social distancing and staying at home effectively reduced transmission of the coronavirus, saving vast numbers of lives (Flaxman et al., 2020). The question is what can we learn from the pandemic responses. We are not in a position to evaluate which country did best, and our aim here is not to functionally evaluate the effectiveness of governments’ responses to COVID-19. After all, alternative paths might lead to similar outcomes. Rather, in this research we explored how one government responded to the COVID-19 pandemic, to better understand agility and adaptiveness in crisis response, to define pertinent research issues and to make practical suggestions for the future. Our study is based on the case of the Netherlands, as the authors have deep knowledge of the situation there. We found several contradictory results, suggesting there is no single best way and there is a need to cope with paradoxes.

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2. Theorizing agile and adaptive governance

2.1. Agility

A common misconception is that adaptive governance is the same or very similar to agile governance or agile organizations. However, agile governance is related to working practices and methods to facilitate quick response (Beck et al., 2001). In businesses, agile organization is a way to facilitate timely responses to changes in the environment, like changing customer needs and technology developments (Tallon, Queiroz, Coltman, & Sharma, 2019). Agile governance is an “organizational culture and methods of collaboration to achieve higher level of adaptiveness” (Mergel, Gong, & Bertot, 2018: 291).

Agile governance is rooted in the field of software development, with its “Manifesto for Agile Software Development” (<https://agilemanifesto.org/>). The principles contained in that manifesto have been continually developed and widely adopted, at first mainly in business and government and later extended to the organizational level (Overby et al., 2006). The process has been adopted for developing and innovation software-based services and applications. Thus, the idea of agility spread gradually from software development to the services and other processes for which software is the basis. An army of consultancies have been active in this field, developing and transferring best practices and certifications, and many courses are available to help organizations become “agile.”

Over time governments too have embraced agility (Alexandre, Kruchten, & de Moura, 2013; Talby & Dubinsky, 2009). Frameworks have been developed for agile governance, like the Scaled Agile Framework (SAFe) (Merhout & Kovach, 2017). The base of agile governance ability to sense changes and respond quickly are founded in several theories, such as networking theory (Heck & Vervest, 2007) and capability theory (Overby et al., 2006).

2.2. Adaptivity

Adaptivity is often equated with agility, but they are not the same. Both agility and adaptive governance focus on responding and dealing with uncertainty and changes in the environment. However, they do so in different manners. Originating from evolutionary theory, adaptivity was initially applied to examine organizations in their natural environment. Theories on adaptive governance speak of “fitting” with changing and new environments and “learning” as the core of governance efforts. The ability to fit with a changing environment is understood to be a prerequisite for survival. Darwin was perhaps the most famous espouser of adaptation, in reference to selection of species. For governments to survive, people have to keep their trust in their institutions (Aldrich & Pfeffer, 1976). As society changes, governments need to adapt and in turn governments influence society.

2.3. Comparing agile and adaptive governance

Response to change is key in both agile and adaptive governance. Agile governance is geared towards methods to respond to uncertainties stemming from a – usually natural – environment, that also select. Reflecting its roots in software and service development, agile governance is primarily reactive. Its aim is to cope with changes and with complexity in innovation. Adaptivity has a more systemic slant, and can change the environment as well. Adaptivity enhances a government’s capacity to deal with change, while protecting society from instability (Janssen & van der Voort, 2016). Table 1 summarizes key differences between agility and adaptability.

In times of uncertainty and complexity, both agility and adaptability are needed. In software development, Boehm (2007) suggested that, although agile and plan-driven approaches are polar opposites, synthesizing them can provide developers a better repertoire. In a similar vein, agile and adaptive governance can complement each other.

3. Agile and adaptive governance in action: the Dutch response to COVID-19

The COVID-19 pandemic has been dramatic for many. Yet for research, its potential as an opportunity to learn is undeniable (Sein, 2020). For our study we used the concepts of agile and adaptive governance to analyze the Dutch government’s response to the pandemic.

Government had to adapt within a very short time span to address the COVID-19 threat. After all, there was a very real risk that the virus would spread uncontrollably if not dealt with quickly and adequately. We interpret “government” here broadly, as consisting of the entire system of public, private and semi-public actors that jointly serve the public good. In the face of COVID-19, there was an urgency for these actors to respond, and at the same time considerable uncertainty about the situation, the potential effectiveness of the measures proposed to stop transmission, and the population’s willingness to accept anti-virus measures and adhere to them.

The COVID-19 pandemic required adaptability particularly in the following domains:

- Hospital capacity
- Testing and contact tracing
- Food supply assurance
- Medical equipment supply
- Prescription drug supply
- Funding to keep the economy running

Table 2 summarizes the progression of events in the Netherlands. Ultimately, the country opted for what it labeled a “smart lockdown” policy, though how successful this was is as yet hard to tell. The gist of the “smart lockdown” was that many anti-virus measures were encouraged rather than mandated. This shifted much responsibility to the individual level, and allowed individuals a degree of leeway to adapt to local conditions and the unfolding circumstances as they saw fit. With this approach, the country was successful in rapidly scaling up intensive care capacity and keeping the economy running.

Many citizens were relieved that the chosen policy was not a complete, mandatory stay-at-home order. People were advised to stay home, but allowed to move around as they saw fit. Many shops remained open. The policy was said to have attenuated the pandemic’s negative impact on the Dutch economy, although the effects have still been very severe. The policy was not applauded by all. The World Health Organization (WHO), for example, criticized the Dutch government for failing to provide enough testing capacity to control transmission of the virus (Klaassen & Van Mersbergen, 2020). Neighboring country Belgium, too, considered the Dutch measures too lenient and closed its borders in response (Eijvoogel, 2020). The Dutch government was also criticized for delaying the production and ordering of personal protective equipment (PPE) for health care workers and face masks for the public. There were more glaring missteps as well, such as the spectacular flop of an “appathon” to choose a virus tracking app for use by the Dutch public.

4. Adaptability issues

The COVID-19 virus and its sad consequences spread quickly around the globe. Many countries were caught by surprise and had to act without much time to reflect. In the Netherlands this raised three categories of governance issues:

- The time issue – what is the right order to respond to the different challenges?
- The centralization issue – what is the proper level to decide?
- The stability issue – how to change and stay in control?

Table 1
Agile and adaptive governance compared.

	Agile governance	Adaptive governance
Origins	A reaction to the waterfall mode of planning in software engineering. Later the concept of agility was extended to the organizational studies and governance	Founded in evolutionary theory, but integrated notions from other domains, such as organizational ecology, political science, ecology, systems theory, and complexity theory
Scope	Usually applied in development and innovation projects	Usually applied in public policy and governance
Lead motive	To satisfy a client	For survival
Main objective	Sensing events and responding quickly	Learning and maintaining fit
Types of problems addressed	Those involving changes in technology, market developments and customer satisfaction	Complex societal issues having many stakeholders with diverging interests and uncertainty about the actions to be taken
Key processes	Stepwise, incremental innovation, gaining quick feedback and using it to improve, working in multidisciplinary teams	Maintaining own fit with the environment, with both subject to change. Since adaptive governance is mainly descriptive, no prescriptive key processes are defined
Assumptions	<ul style="list-style-type: none"> ● Focus on the own organization and internal response ● Changes in market or technology require a fast response ● Decision-making is pushed to lower levels to enable quick responses ● A fixed governance structure (e.g., in squads, tribes, chapters or guilds) enables quick responses ● Many small improvements and continuous evaluation ● Emphasis on speed of change and quickly working towards solutions 	<ul style="list-style-type: none"> ● Takes larger systems into account, including a variety of players ● Decision-making and responsibilities are scattered among various levels and organizations ● No fixed collaborations; rather, organizations change to enable fit with environment ● No fixed approach for adaptation ● No clear solutions exist, which makes it hard to experiment
Criticisms	<ul style="list-style-type: none"> ● Can be replace planning approaches, though these planning can be appropriate for certain situations. ● Little predictability and difficulty in keeping projects on track ● Externally focused instead of influencing changes ● Governance is challenging as resources are often constant and prioritization of activities is needed 	<ul style="list-style-type: none"> ● Descriptive nature focused on explaining what is happening ● No proven solutions or methods that can be readily used ● Broad scope, which makes it hard to put in action ● Multi-method, necessitating mindful use of methods and tools

4.1. The time issue – what is the right order to respond to the different challenges?

There is a rich literature on organizations adapting to their environment, largely informed by evolutionary theory. In this literature, adaptation is seen as a response to the environment over time. If an organization does not respond, the fit between the organization and the environment will likely diminish (Aldrich & Pfeffer, 1976; Greenwood, Oliver, Lawrence, & Meyer, 2017). Ultimately, the organization may die.

This does not mean that an organization has to respond to each and every change in its environment. Yet, if it fails to respond in time to an event that proves significant, damage can start to occur without being noticed. Then, the challenge of pace (agility) is added to the mix. While

quick responses are sometimes essential, decision speed may compromise the quality of decision-making. Once made, decisions can lead to path dependencies and lock-ins. Alternative paths that appear more promising at a later stage might be blocked. The pacing challenge points to a key dilemma in adaptive governance: how to respond quickly and responsibly once damage has already started to occur.

In the Netherlands, several issues were identified upon the first signs that the impact of the virus would be serious. First, prevention measures were announced. Initially, these applied only regionally, in the Province of North Brabant, which was hardest hit. But soon they were expanded to the entire country, indicating that the potential of the pandemic was not fully recognized in the first week of March.

As the days passed, multiple bottlenecks appeared. Particularly concerning was the limited intensive care capacity in Dutch hospitals.

Table 2
The unfolding of the COVID-19 crisis in the Netherlands. Source: Information from https://nl.wikipedia.org/wiki/Coronacrisis_in_Nederland.

Date in 2020	Major events
January 24	National Outbreak Management Team (OMT) assembled, bringing together infectious disease experts under leadership of the National Institute for Public Health and the Environment (RIVM), which is linked to the Ministry of Health, Welfare and Sport. The OMT is tasked to advise government about the virus and measures to control it
February 27	First COVID-19 case confirmed in the Netherlands
March 6	First COVID-19 death confirmed in the Netherlands
March 6	Extraordinary measures put in place for the Province of North Brabant, where the virus is rapidly spreading. Residents called on to refrain from handshaking and to stay home if they feel sick
March 9	Measures scaled up to national level. Government says everyone in the country must refrain from handshaking
March 15	Schools, bars and restaurants ordered closed. Everyone is called on to work from home as much as possible. The only exception is those in “vital professions,” such as health care workers. The main message to the public: “Stay home!”
March 16	Concerns mount about the country’s intensive care capacity. At a press conference, the government alludes to pursuit of “group immunity” as a strategy. The idea is that, as the spread of the virus cannot be stopped, transmission should be slowed as much as possible. This will ensure that health care capacity is not overwhelmed, as the number of people with immunity to the virus slowly grows in the long run
March 20	Due to capacity shortages, COVID-19 testing is available mainly for hospitalized patients only
March 23	All events are banned and local government is given discretionary authority to order shops to close and to disband groups and parties
April 5	Intensive care capacity doubled
April 6	Testing capacity expanded
April 7	The Minister calls on the private sector to develop a corona track-and-trace app for public use
April 14	In light of the continued scarcity of COVID-19 tests, general practitioners start tracking probable COVID-19 cases among their patients
April 17	The Dutch Data Protection Authority criticizes the candidate track-and-trace apps. A proposal to require the public to use such an app is rejected because of privacy issues
April 21	Number of hospitalized COVID-19 patients exceeds 10,000 with more than 4000 confirmed COVID-19 deaths in the Netherlands
May 21	The Minister announces development of a “dashboard” to track data on COVID-19
June 4	Dashboard launched

As numbers of hospitalized patients grew rapidly, it quickly became apparent that the existing intensive care units would be insufficient to deal with the crisis. In March this was the primary concern of the Outbreak Management Team (OMT). Hospitals were asked to use all available resources to scale up their capacity and to share the burden. The results of these improvisations were impressive. While capacity lagged a bit behind the Minister's announcements, it seems to have still been sufficient to cope with the growing number of patients.

The next issue was availability of PPE. Workers in vital professions that required them to be near others were particularly vulnerable to infection (and to unknowingly spreading the virus further). They needed access to protective equipment such as gloves and face masks. However, PPE was in scarce supply around the globe. Every country was scrambling to ensure their own supply, and nobody was eager to share. Despite substantial resources invested, PPE scarcity in the Netherlands remained until mid-May. During this period the public was explicitly asked not to purchase face masks, as they were needed in the health care sector. Moreover, government spokespersons repeatedly stated that use of PPE among the general public, particularly face masks, was unnecessary if people followed the "rules" (no handshaking, stay home if you feel ill, work from home as much as possible and maintain 1.5 m distance from others). Some have suggested that the government's skepticism as to the value of face masks among the public was informed as much by the scarcity of supply as by scientific recommendations.

In sum, the emphasis of Dutch policies changed over time. First preventing spreading was the focus. Then, scaling up intensive care capacity became the main goal. After that, remedying the scarcity of testing capacity became the priority. As the crisis unfolded, impressive improvisation talent was exhibited by all those involved. Still, looking back the policies seem meandering and reactive. Critics have especially latched onto the scarcities of supplies, saying these were continually recognized and acted upon too late. Whether these criticisms merely reflect hindsight bias is impossible to say as yet.

The critical arguments do provide interesting food for thought with regard to adaptive governance. Critics claim that the composition of the crisis team was not ideal (Bezemer, 2020). First, the National Institute for Public Health and the Environment (RIVM) based its recommendations on models. Yet, models can prevent out-of-the-box thinking, as they are by definition grounded on extrapolations. As an alternative to the use of models, simply looking at experiences in other countries could have introduced variables that were not imagined in the building of the models. Second, RIVM and the crisis team consisted mainly of virologists. This might have produced a rather one-sided view, bypassing valuable ideas that, for instance, behavioral scientists might have contributed. The monodisciplinary composition of the crisis team may have prevented decision-makers from appreciating challenges that were not modeled and not in the domain of the virologists, such as the looming scarcity of PPE and testing materials.

Critics claimed, too, that the COVID-19 "dashboard" was developed too late. This again, may reflect the benefit of hindsight. It took time to realize what data were essential, to gather these and to choose the right methods for processing and presenting them. Still the dashboard – imperfect as it may be – could prove essential in a next round of the prevention game. Where the critics may have a point is that a scenario for developing a dashboard for a pandemic could have been developed ahead of time, to have "on the shelf" in case a pandemic struck.

Interestingly, Dutch government proved to be agile and was able to respond quickly. Although its responses to the identified issues were quick, questions can be raised about whether government prioritized the issues appropriately. Here we find an indication that agility may exact a price. It may lead to lock-ins, or at least, to overemphasis on some issues to the detriment of others. The line between agility and overreaction may be thin in a crisis. Here, agility contrasts with adaptivity. The government did not have institutions in place to be adaptive, such as scenarios for the composition of vital think tanks, a scenario for

provision of essential PPE and integrative instruments for prevention (such as the dashboard).

4.2. The centralization issue – what is the proper level to decide?

Strategies of adaptive governance include utilizing internal and external capabilities, decentralizing decision-making power, and seeking to inform higher-level decisions from the bottom up (Janssen & van der Voort, 2016). The literature on adaptive governance offers much discussion on the centralization issue. Decentralization facilitates adaptation to local circumstances. However, centralization aids coordination, which may facilitate adaptation as well. The best path may depend on circumstance (Hong & Lee, 2018).

It is well-established that crisis legitimizes central authority, since for rapid decisions decision-making levels need to be circumscribed (Hamblin, 1958). This is crucial, as in multiple federalist countries we witnessed friction between central and decentral levels of authority in the COVID-19 response. Particularly high profile were such conflicts in the United States and Brazil (Reuters, 2020; Phillips, 2020; Elkind, 2020). More productive conflicts seemed to play out in Germany, also a federalist state, where regional governments designed and implemented their own control policies tailored to the local situation (FT, 2020). Although the Netherlands is a decentralized unitary state, a national approach was taken. Still, conflicts regarding levels of authority also emerged here, of which some were more productive than others.

A first centralization issue was the way statistics on infections and deaths were constructed. RIVM released figures related to the virus on a daily basis. Yet, because of the lack of testing capacity, there were no valid statistics on total numbers of infections or even the exact causes of deaths in many cases. RIVM chose to report only cases and deaths that had been confirmed by tests, ignoring unconfirmed infections and deaths as a result of the virus (RIVM, 2020). These "official" figures were criticized from the start. Eventually, Statistics Netherlands published alternative estimates based on numbers of deaths counted in an average week of the same period in previous years (CBS, 2020). Moreover, general practitioners began recording probable COVID cases among their patients, as they lacked testing capacity to confirm these diagnoses (Le Clercq, 2020). This somewhat loose governance mode of producing intelligence *de facto* generated a variety of statistics, ultimately resulting in a good overview of the situation for the public and the government.

A less productive conflict arose in an effort to encourage development of a smartphone corona track-and-trace app. For this, the Minister announced an "appathon." The idea was to encourage developers to quickly produce a variety of candidate apps. The appathon was announced centrally, but was essentially a decentral undertaking, as companies were to develop their apps in parallel. Proposals would be tabled at a central event, after which the apps would be evaluated and the best one chosen (Rijksoverheid, 2020a). The Minister even considered making use of the selected app mandatory. Seven apps were developed in just one week (RTL, 2020). However, all of them were quickly eliminated upon closer scrutiny of the (central) Dutch Data Protection Authority, because of privacy issues. The Data Protection Authority went on to criticize the Minister for failure to formulate clear requirements for the app (AP, 2020). Other criticisms concerned the apps inability to accurately detect distance and the need for a critical mass of users for the app to be effective (Slager, 2020). Of course, all countries where apps were being considered for this purpose ran into similar difficulties. Software teams in the Dutch government have used agile approaches for decades. The pervasiveness of agile methods in this domain enabled companies to develop an impressive number of candidate apps in a very short time span. However, the apps fell victim to the tensions between central authorities (the Ministry and Data Protection Authority) and decentral developers. More time was needed for these tensions to lead to productive coordination – both among authorities and between authorities and developers. In terms of

adaptive governance, there was a lack of institutions in place to facilitate this coordination, such as mature regulations on privacy that could be easily incorporated into app development. Without such institutions, the ad hoc effort spectacularly failed – despite the embedment of agile methods.

In sum, adaptive governance requires a mix of central and decentral efforts. Here country legacies of culture, laws, and technological constraints play a role, as some countries are federations while others are more unitary states. Either way, conflicts between governance levels seem unavoidable, even in times of crisis. For adaptive governance it is essential that such conflicts be productive, and that they do not damage critical operations or undermine the credibility of key actors. The institutions that regulate centralization and decentralization are key in this regard. These were sorely tested by COVID-19.

4.3. The stability issue – how to change and stay in control?

Stability and adaptivity seem to be at odds, but both are needed in times of crisis (Janssen & van der Voort, 2016). Adaptation implies change, but stability must be preserved in the process. Bureaucracies – with horizontal and vertical specialization, predefined tasks, responsibilities, procedures, formats, etcetera – are usually designed or developed for stability and efficiency. Often they demonstrate “silo” structures and mindsets, alongside inefficiencies and conservatism, and thus seem to compromise potential innovation and flexibility (Butzer, 1980; McKenzie, 1983). In this light, it is reasonable to ask if bureaucracies can be adaptive, and if so, how? The COVID-19 crisis may provide some evidence here. When the virus hit, bureaucracies played an important, positive role for organizations that tried to adapt. We present three examples below.

First, when the pandemic proved serious, the Dutch government activated its protocol for crisis management. This facilitated coordination at the highest level. Among other things, coordination tasks were delegated among key ministers (the Minister of Justice and Security; the Minister of Health, Welfare and Sport; and the Prime Minister) and a key advisory role was assigned to RIVM. This facilitated quick decision-making by the key ministers, while ensuring the availability of essential knowledge. This crisis protocol is an example of bureaucracy (i.e., procedures) facilitating adaptivity. The protocol was developed in 2016, to be tailored to any crisis that required coordination at the highest government level. It represents an extra layer of bureaucracy, since it is designed to be activated in a crisis. Yet, it enabled the government to quickly switch to an adaptation mode.

Second, the daily processing and announcement of statistics on COVID-19 infections and deaths – imperfect as it was – required a reliability that only a bureaucracy can deliver. On a daily basis, figures were aggregated from multiple organizations at multiple layers and from multiple professions using common standards and methods. Without formal bureaucracies with clearly defined responsibilities, formal lines of authority and deadlines, these statistics could not have attained a sufficient level of reliability and certainly could not have been processed with the same regularity.

Third, the Netherlands faced a shortage of PPE, particularly medical masks and gloves. There was a very real risk that the shortage would become even more acute, affecting even the medical professionals treating COVID-19 patients. To ensure that the available materials were distributed appropriately, so that the health professionals in contact with COVID-19 patients would get them first, the distribution was centralized. Also, the Minister was tasked to use all available resources to acquire as much PPE as possible. A national consortium was formed to draft procedures for appropriate distribution, while also stimulating PPE production for Dutch use (Rijksoverheid, 2020b). The consortium was a bureaucratic improvisation, responsible for developing a distribution model for all, in cooperation with health organizations with a stake in the problem (Rijksoverheid, 2020c). Coordination without a bureaucracy would lead to unfair distribution of materials, leaving

blind spots in critical health care professions. Still, the consortium has been criticized as operating too slowly, which is a common criticism of bureaucracies (Leijten, 2020).

In sum, bureaucracy is often viewed as antithetical to adaptability. Without idealizing bureaucracies, we would claim that bureaucracies are vital to fight a pandemic such as COVID-19. Bureaucracy is needed to be able to quickly implement new policies and measures and to ensure compliance with policies. Indeed, as demonstrated by the Dutch crisis management protocol and the processing of statistics, bureaucracies enabled agility and adaptability in the Dutch case. They facilitated swift priority changes and relatively reliable statistics which could be swiftly communicated and used in policymaking. Taking a broader perspective, our findings on bureaucracies can be combined with our findings on the previous two issues, to point to the role of institutions in providing the stability that enabled decision-makers to be agile. Institutions provided reliability, anticipated the conflict inherent in changing governance structures, and anticipated the need for knowledge (Bendor & Moe, 1985). For adaptive governance, values like agility, flexibility, and improvising talent are not goals in themselves. At higher levels, such as the government of a nation, too much flux can lead to confusion, hindering adaptivity in a crisis such as COVID-19.

5. Discussion: Implications for theory and practice

5.1. Implications for theory

Whereas agile governance provides methods, adaptive governance is a descriptive rather than a prescriptive concept. As such, we lack strict operational standards by which to evaluate the ability of organizations – such as governments – to learn or survive. The COVID-19 pandemic provided an opportunity to see adaptive governance at work in a relatively short time span, and to learn about its principles.

A first observation is that adaptive governance in a crisis situation like the COVID-19 pandemic is inherently paradoxical. The Dutch case demonstrates that agility may come at the cost of adaptivity, even though both concern change and uncertainty. We also saw that conflict sometimes facilitates adaptivity. Finally, we found that bureaucracy – though known for its slowness and slack – is actually essential for adaptivity and to be able to respond quickly.

A second observation is the importance of existing institutions in times of crisis. Well-designed institutional scripts and procedures were essential to adaptivity in the Dutch case. A lack of these institutions – for example, as we saw in the app development effort and in the composition of the crisis advisory team – became, at the very least, subjects of harsh criticisms within the country.

These two observations underline a major difference between agile governance and adaptive governance. Agile governance is in essence a method, translated for broader management application, to respond to changing needs and desires of the public. Adaptive governance is not a method. It is a reflection of the genes of government – or the wider system of governance – that enables it to adapt to public wishes and to other events – in our case the COVID-19 pandemic. Adaptive governance relates more to contingency theory, which is focused on the conditions under which certain methods are effective or not (Bradshaw, 2009; Mansbridge, 2014). Examples of contingencies encountered in our analysis are the legacies of culture, laws, and technological constraints. Thus, adaptive governance is not a method by prescription, but a device to describe the mechanisms that drive an adapting governance system.

However, the concept can be used in a prescriptive way. In the context of evaluating adaptive governance we suggest embracing the “double loop” learning model from educational theory (Argyris, 1976; Nooteboom, 2000; Pahl-Wostl, 2009). The model offers a structure for modifying decision-making criteria or goals in light of experience. In the first learning loop decisions are made with the current situation and a clear purpose in mind. This relates to agile governance, as agility

emphasizes responding quickly by making decisions and following agile working methods. However, we must be aware that agility can lead to lock-ins, or at least to overemphasis of some issues at the expense of others. The second learning loop, thus, entails a reflection on institutions to adapt better in the future. This step is closely associated with survival, approaching the essence of adaptive governance. It is not geared for readily applicable solutions, but rather for more mindful use of methods. Further exploration of these theoretical concepts holds promise for better understanding the nature of agile and adaptive governance and the extent to which they are complimentary and conflictive.

5.2. Implications for practice

Various lessons can be learned from the pandemic that will be useful for governments in the future. First, there is *no single best response strategy*. Responses will vary per domain, and even within one government there will be no singular best approach. Agility can be drawn on immediately as regards tools, but this has drawbacks too, as demonstrated by the failure of the agile app development process in the Netherlands. The failure of the process threatened to generate resistance among the general public to use of any app once developed. The context, the situation at hand, the stakeholder tensions, and other factors determined the direction that adaptations took. This suggests the difficulty of applying the concept of agility as more than a method for quickly releasing products, although not fully developed, and responding to feedback. This type of strategy is risky in a crisis situation, as there may be only one shot at an effective response.

The second lesson is that *responses may need to change over time*. As the pandemic unfolded, particularly, responses had to be adapted. Responses that are effective at the start might not yield the same results at later stages. Monitoring, learning and adapting are key here. The focus needs to be on having these capabilities in place. Here, we should take a wider perspective than just government. Responses to the pandemic in the Netherlands were not limited to government. Many non-governmental organizations also took action, including health care organizations, knowledge organizations and relief organizations. They too played an important role in coping with the challenges of the pandemic. In this context, it is the government's role to enable these organizations to cope. For instance, in the Dutch case, government did not resist the collection of a variety of meaningful statistics about the pandemic, and was open to the alternative methods underlying the figures. This variety and openness facilitated organizations and individuals in responding appropriately in line with their specific circumstances.

The third key lesson concerns the need to *adapt, but ensure stability at the same time*. Adaptive strategies may challenge stability and accountability (Janssen & van der Voort, 2016). Stability is needed to be able to respond. Under time pressure it may be unwise to change structures or to create new solutions using agile methods. While changing structures and decision-making authorities takes time, institutionalized mechanisms tend to work well, even if they are ill-designed for the circumstances. People can cope with them because they are familiar.

Fourth, for adaptivity it is essential that government *mobilize society*. In the Netherlands, government provided general guidelines and, whenever possible, shifted responsibility to the individual level. People were thus called on to adapt to their local circumstances and make decisions taking into account their own context. Wang, Medaglia, and Zheng (2018)) argued that adaptivity requires new forms of collaboration and shared decision-making and accountability between government and non-government actors. Here, too, adaptivity is more than a government trying to cope. In times of crisis adaptivity is equally applicable to society at large.

Finally, the pandemic has demonstrated the value of having a *variety of response strategies available*. Evolutionary theory suggests that variety is needed, so selection can occur to maintain fit with the environment.

In the COVID-19 crisis the wide repertoire of strategies and organizations involved ensured that different types of responses were possible. Nonetheless, involvement of too many institutions may lead to confusion and thus be counter-effective in the end.

There are many ways that the concepts of agility and adaptivity can be applied to government management of a crisis. The COVID-19 pandemic, like all crises, hit every country in a unique way, making it difficult to make comparisons. In the Netherlands, political leaders offered a shared vision, which was accepted even though there were many alternative paths. This might easily have been challenged other contexts or situations. Often decision-making and responsibilities scattered among various organizations complicates efforts.

6. Conclusions

The COVID-19 pandemic has had terrible repercussions, causing sickness and death around the world. At the same time, it offers a cameo of government's ability to adapt. Governments, together with semi-public institutions and private organizations, have struggled to cope with uncertainties from the strategic to the operational level. We analyzed the response of the Dutch government to the COVID-19 pandemic, to learn about adaptive governance in practice. Specifically, we investigated issues of timing, centralization and stability.

The Dutch COVID-19 response suggests that agility and adaptivity can go hand in hand, but they can also conflict in practice. Hence, agile and adaptive governance should not be mixed up, as they have different origins, purposes, and implications. Agility is in essence a method originating in the software development industry and since applied to organizations. Adaptive governance takes a contingency approach and is method-agnostic.

We also found that adaptive governance requires a high tolerance for paradox. It involves both rapid *and* sound analysis for decisions. It requires both centralized *and* decentralized mechanisms, innovation *and* bureaucracy, and both science *and* politics. With this claim, the next question is how have governments in countries dealing with COVID-19 recognized and coped with these paradoxes? Furthermore – as an equivalent of learning – how have governments institutionalized these recognition and coping efforts, incorporating the wider governance system, including semi-public and private actors? It is this institutionalization that facilitates adaptive governance in the longer term.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.ijinfomgt.2020.102180>.

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