Material Supply Strategy in a Crisis

PART 3

Learnings from an international study on public procurement crisis preparedness for the Netherlands

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1 Introduction

In 'normal' times, the supply management of personal protective equipment (PPE) and intensive care unit (ICU) equipment is a routine operation. Relatively, demand is predictable, products are not high value, and supply-side risks are low. In just a few weeks, the situation changed dramatically as the COVID-19 pandemic caused both unprecedented demand peaks and supply chain disruptions. The scarcity of medical materials threatened to become a bottleneck for the capacity of healthcare systems worldwide. With regular supply chains seemingly unable to fulfill demand, central governments and healthcare providers responded – with varying levels of effectiveness – implementing additional measures to secure sufficient face masks, gloves, aprons, hand sanitizers, ICU ventilators, and other scarce medical supplies.

In the MaSSC (Material Supply Strategies in a Crisis) research project we aim to draw lessons from this crisis and its repercussions. In the **first** part of the research[1], the Dutch response to the material shortages was extensively explored and studied. The first part of the MaSSC study informed the readers about the stakeholders involved, the strategies and efforts pursued to obtain sufficient medical materials and distribute them across health organizations, and the challenges and lessons learned. The report proposes six measures that together will improve the preparedness for a next (health) crisis with an impact on material supply in the Netherlands.

In the **second** part[2] of this study, we broadened our evaluation to include an international perspective on supply strategies in the light of COVID-19 and its consequent shortages. Through interviews with 45 public procurement experts from 33 countries around the world, the second part of our study illustrates what these countries are doing now to improve their crisis preparedness by learning from COVID-19. The report also reflects on what the local public procurement experts think their respective countries *should be doing*. In this second part we identified five clusters of countries that faced similar (main) challenges during the crisis. The analysis of these clusters includes both internal factors, and external contextual factors. For each of these clusters of countries the report recommends strategies to improve crisis preparedness based on what the interviewed experts identified.

In this **third** and final report, we combine the international perspective with an additional analysis of preparedness in the Dutch context. In terms of the clusters of countries: where does the Netherlands fit? Learning from public procurement experts across the world, what should the Netherlands do to be better prepared for future (health) crisis from a procurement and supply management perspective?

[1] MaSSC Report I
[2] MaSSC Report II (publication pending)

2 Set-up of this research

This report aims to inform Dutch policy makers and procurement experts on the relevant findings from the international study on crisis procurement in the advent of COVID-19. The report combines the findings from the first part of the MaSSC study (a detailed analysis of the response to material shortages in the COVID-19 pandemic in the Netherlands) with the findings of the second part of the MaSSC study (an analysis of what countries around the world are doing to improve their preparedness based on what they learned from COVID-19). Below is a short recap of these two studies.

Part I of the MaSSC study is a comprehensive analysis of the Dutch response to COVID-19 from a procurement and supply management perspective. Based on interviews with 60 stakeholders involved at all levels in the Dutch response, complemented with an extensive document study, the first report provides a reconstruction of relevant events and actions.

Using the insights from these interviews and document study, in Part I we provide a holistic system-wide view of events, actions and their desired and undesired consequences. We provide recommendations for future improvements of crisis procurement (and preparedness).

Part II is grounded in the findings of part I, in addition to other studies on crisis management and COVID-19 supply chain management issues. In the second part of our study we move to a new perspective in two ways. First, we change the scope of the analysis towards a set of 33 countries around the world. Second, we shift our focus to the future: based on their experience with COVID-19, what are countries doing now to be better prepared for future (health) crises? Through interviews with 45 experts on public procurement, the second part analyzes (1) what countries are doing with respect to future crisis preparedness, and (2) what these countries should be doing according to the public procurement experts interviewed.

In both parts of the research, interviews are conducted based on a structured interview protocol. The interviews are transcribed, transcripts are checked with the interviewee for correctness, and then systematically analyzed using Atlas.ti software. Both studies comply fully with university[3] and ZonMw standards for research ethics and open science. More details are provided in the reports for Part I and Part II of the MaSSC study.

For this third and final report, no additional data was gathered. Rather, we systematically analyze the findings from Parts I and II to address the final research question:

What are the meaning and implications of these findings for the Netherlands?

[3] Ethical approval and data management processes for the MaSSC research were managed by the University of Twente.

3 Recap of past reports: Supply strategies and their consequences in the Netherlands and abroad

3.1 Recap of MaSSC report I

Part I of MaSSC provides a detailed account of the Dutch response through an extensive document study and 60 interviews.[4] Here we limit the overview of findings to a very brief summary of the main challenges encountered, and the recommendations that followed from that analysis.

We identified three key problems that were at the root of the obstacles and challenges encountered and perceived in the Dutch response to material shortages in the first wave of COVID-19. These three problems are:

1. *The lack of an adequate (and pre-existing) national crisis structure for the procurement of medical products on this scale, in combination with a decentralized national healthcare structure.*
2. *A regular procurement strategy focused on price and efficiency.*
3. *The lack of an adequate EU-wide crisis structure for procurement of medical products on this scale.*

When shortages of mouth masks and other personal protective equipment reached critical levels, a centralized initiative was launched for buying and distributing PPE across organizations in the health sector. In the context of a highly decentralized health care system and without pre-existing crisis structures for this purpose, coordination and governance were very challenging. Decision makers, procurement experts and subject matter experts were brought together while organizations in care and cure were running out of stocks at a rapid pace. Especially during the first weeks, care providers experienced unclear communication – which reduced trust in the national initiative and made care providers reluctant to share accurate information on existing stocks. Initiatives and responsibilities to take account of stocks, (re)distribute supplies changed. The combination of a decentralized healthcare system and no 'off the shelf' protocols or plans for a centralized approach to material supply was at the root of these problems.

In normal times, sourcing strategies for standard medical products are focused on low prices and efficiency. Supplies are sourced from East Asia through wholesalers, in supply chains that proved to be vulnerable to disruption. To make matters worse, this limited resilience was hidden for most healthcare providers because of the lack of insight into their supply chains beyond the first tier. As a result, buyers had to resort to new unknown suppliers and new markets, leading to issues with reliability, requiring new distribution channels, presenting quality problems, and amplifying uncertainty.

Internationally, opportunities for a collaborative approach to the problem of shortages – for example at the level of the European Union – were not seized effectively. Even within the EU, countries closed their borders to constrain exports to other EU member states. Rather than joining forces by consolidating demand and building a more powerful market position

[4] MaSSC Report I, including executive summary

(which was attempted in a joint tender but failed), EU member states began competing against each other and other countries and continents in an already overcrowded market.

Based on detailed analysis of the interviews, six key measures to address these challenges are identified:

Supply-side measures:

1. *Increase resilience through stockpiles*
2. *Increase domestic production capacity*

Capability measures:

3. *Setup integrated information system(s) for data sharing*
4. *Shift towards category management*

Coordination measures:

5. *Setup an organization for increased central procurement power*
6. *Establish crisis procurement protocols*

For each of these measures, important questions, practical considerations, and courses of actions are summarized in Part I (see Appendix 1). For example: before implementing stockpiles, there are many questions to address: *Which products should be stockpiled? How many items of each product? Where to store them? When to implement stockpiling?* and practical considerations: *the risk of expiry of products*, *costs of coordination,* and *management skills required.* Recognizing these questions and challenges, interviewees mentioned six different courses of action: *rolling stockpiles, selling and buying arrangements, uncoupling ownership from stockholding, stockpiling raw materials, industry involvement, and EU stockpiles*. Hence, the implementation opportunities for each of these measures are simultaneously reported in Part I.

These measures address different facets of a highly complex and dynamic situation; they are interconnected, and not to be regarded in isolation. We conclude that, in combination, these measures provide a route to building a more agile and resilient system that is (better) prepared for future crises. In addition, it is vital that the involved stakeholders become familiar with protocols for crisis procurement and trust in this system that has been built, in order to avoid confusion and rivalry.

3.2 Recap of MaSSC report II

The second report on the international research on preparedness of public procurement for a future (health) crisis consists of five sections that build on each other. The first section consists of an analysis of the challenges, current responses, and strategies with respect to the five themes of COVID-19 crisis procurement as established by Harland et al[5].

1. *Governance*: coordination and rivalry; organization and maturity
2. *Regulations and procedures*: procurement laws and existing crisis procedures
3. *Supply-side issues*: vulnerabilities and commitments to the supply base
4. *Skills and Competences*: individual professionalism; supply chain management
5. *Information systems*: digitalization; data management

The second section provides a clustering of countries according to the main challenges and obstacles faced during the pandemic with respect to procurement and supply management. Here we identify five different clusters:

1. Insufficient procurement professionalization
2. Regulatory hurdles
3. Strained harmonization endeavors
4. Striving to enhance supply chain knowledge
5. Collaboration and coordination obstacles

Whereas these clusters are based on the main challenges encountered during COVID, the influence of external factors could not be underestimated. The third section consists of analysis of external influences in relation to the five clusters. To combine the internal challenges and external factors, the fourth section provides an analysis for each cluster of internal strengths and weaknesses, set off against external threats and opportunities, to derive lessons that future agendas can utilize within their strategic planning for improved crisis preparedness. Lastly, we identify three main tensions that require balancing to improve public procurements' preparedness for future crises, that are apparent across all countries.

These five analyses are based on 45 expert-interviews from 33 different countries. However, the question remains, what the meaning and implications of these findings are for the Netherlands. We discuss the highlights of report part 2 more thoroughly in the next chapter whilst at the same time discussing the lessons learned and implications for the Netherlands.

[5] In the early summer of 2020, an exploratory international study inventoried the procurement challenges in the beginning of COVID-19. This study captured five themes based on practitioners' learnings of procurement and supply challenges in the pandemic. Reference: Harland, C.M., Knight, L., Patrucco, A.S., Lynch, J., Telgen, J., Peters, E., Tátrai, T. and Ferk, P. (2021), "Practitioners' learning about healthcare supply chain management in the COVID-19 pandemic: a public procurement perspective", International Journal of Operations & Production Management, Vol. 41 No. 13, pp. 178-189.

4 Reflecting international learnings onto the Netherlands

4.1 Challenges and responses with respect to the five themes of COVID-19 crisis procurement

Below, we present the highlights the first analysis of Part II of the report. This analysis consists of the five themes identified by Harland et al.: governance, regulations and procedures, supply side issues, skills and competences, and information system. After the highlights of each theme, we reflect on how they correspond to the Dutch situation.

Highlights of governance

Opting a centralized or decentralized approach for the supply of medical equipment is often debated. However, our findings in Part II show that many different factors influence what we consider good or bad network governance. These factors include trust, willingness, structural complexity, resistance, degree of local empowerment, the (mis)match between power and knowledge, the equality of distribution, inclusion of private sector, and collaboration outside of national governments.

Based on experiences, examples, and evaluations of interviewees, we summarized the positive and negative features of adopting a centralized and decentralized approach in the table below. Whereas international collaboration and private sector inclusion are not influenced by the type of approach, interviewees did emphasize their importance. Private sector collaboration can enhance knowledge, enlarge networks, and increase infrastructure.

	Positive features	Negative features
Centralized	• Increased professionalization (abilities) and resource pooling	• High focus on bureaucracy & control • Lack of trust in regional institutions • Lack of local expertise • Mismatch between power and knowledge • No equal distribution mechanisms
Decentralized	• Semi-complex decentralized structures, trust & willingness, leading by example can lead to collaboration and cooperation in times of crisis (example from Australia) • Power in local decision making • Engaging capabilities and networks of local leaders	• High variability in professionalization, low integration • Resistance and highly decentralized structures hinder cooperation • Slow decision making due to local inclusion

Reflections on the Netherlands regarding governance

In the first part, we discussed the challenges with regard to the inadequate national crisis structure for large scale procurement, in combination with a highly decentralized approach in the Netherlands. As such, Dutch interviewees considered an organization for increased central purchasing power, moving towards a more centralized approach.

Report I: "The main aim of a central procurement organization should be to pool procurement capacity, gain experience, build a supplier network and gain trust, and collaborate with healthcare providers (through familiarity) to be prepared adequately to take on future crisis procurement together. […] Interviewees emphasized the importance of a national organization to work in crises and establish procedures and trust throughout stable times. This makes collaboration and centralization during a crisis like the COVID-19 pandemic easier, as the structure readily exists, and trust does not need to be built during a crisis. To increase market participation, industry (both buyers and suppliers) should be involved in establishing a national procurement organization from the beginning.

The international findings on the importance of trust, willingness, structural complexity, resistance, degree of local empowerment, the (mis)match between power and knowledge, the equality of distribution, inclusion of private sector, and collaboration outside of national governments resonate well with this measure from Part 1. Learnings from other countries emphasize that the focus should not be on the decentralized versus centralized approach, but rather on the creation of trust, match between power and knowledge and decreasing resistance in the approaches.

Highlights of rules and regulations

Based on the experiences of the interviewed experts, there are numerous factors that contribute to the different approaches to COVID-19. From the data, it is clear that one of these factors is related to how close a country stayed true to legislation. After closely analyzing the reasons for either steering away from legislation or staying close to legislation, the consequences and benefits of such approaches were highlighted. What each approach has in common is successfully assessing risks and alleviating unrest by prioritizing needs, while exploring the limits to disregarding the rule of law. However, some disregarded the rule of law more than others. Both approaches are explored in the table below.

	Reasons	Consequences	Benefits
Steering away from legislation	• Responses not quick enough • Hindering processes approvals • Keeping up with surrounding organizations • The chaos from the crisis led to more chaos	• More chaos • Lack of transparency • Corruption • Forged certificates • Substandard products • Confusion among internal teams	• Reaching material faster • Creation of independent mindset • Feelings that this crisis mode can make changes to legislation
Staying close to legislation	• No existing legislative backbone • Low professionalization • Nationwide historical, social, or political circumstances	• No room for creative thinking • Slow bureaucratic processes • Feeling two steps behind	• More regulated working conditions • Low levels of chaos • Legislative backbone • Little room for corruption

More attention should be given to deliberating how close one should stay to the law and when it is appropriate to surpass it. Data show how important strengthening the public sector can be, as nobody can work without it. Thus, without this deliberation, supply chain transparency (a high-level concern, as mentioned by the majority of experts), may not be achieved.

Reflections on the Netherlands in terms of rules and regulations

In the COVID-19 crisis countries chose between steering away from regular rules and procedures, or sticking to them as much as possible. Within countries that chose to ignore procurement regulations, this led to flexibility but also higher risks of fraud. The Dutch approach mostly resonates with 'steering away from regulation', as Dutch interviewees indicated that procurement regulations were barely followed, certainly in early stages of COVID-19. Mostly because interviewees indicated they would have not been able to get products through the lengthy procedures. However, the consequences were noticeable: a

scandal about fraudulent practices by one of the Dutch suppliers took center-stage.[6] Hence, the importance of supply chain transparency balanced with regulation flexibility is a high and ongoing concern in the Netherlands.

Highlights of supply side issues

Measure	Upsides	Downsides
Framework agreements	• Allow for security, speed, efficiency, and volume guarantees	• Unreliability – it is not enough
Supplier relationships	• Larger networks, • Preferred customer status • Direct communication (with manufacturers) • Better intel (i.e., on quality)	• Loss of control if it is a wholesaler • Possible corruption • Is it enough?
Collaborative buying	• Increased purchasing power • Centralization of procurement knowledge	• Is it enough?
Dual sourcing	• Less dependency • Geographic diversification	• Requires better knowledge of the supply chain • Is it enough?
Stockpiling	• Reusability • Security • Rolling stockpiles	• Costly • Which product(s)? • Maintainability • Scalability
Local industry	• Sustainability • Security • Autonomy • Local jobs • European approach • Cost reduction • Dual sourcing	• Attainability • Quality • Raw materials • Competitiveness • Cost efficiency

The supply measures can be divided in an interesting manner with difficult trade-offs:

- The first three measures can be seen as attainable (price wise) to procure medical equipment in times of crisis. Many experts agree that only having these three options available might not be enough to combat a crisis similar COVID-19 (supply security).
- The last three measures might have a significant influence on supply security in times of crisis but are seen as less attainable in the long term, when demand is stable (price wise).
- Consensus is higher in the first three measures (mostly because it is not very costly, but lower in the last three measures, because it is a high investment).

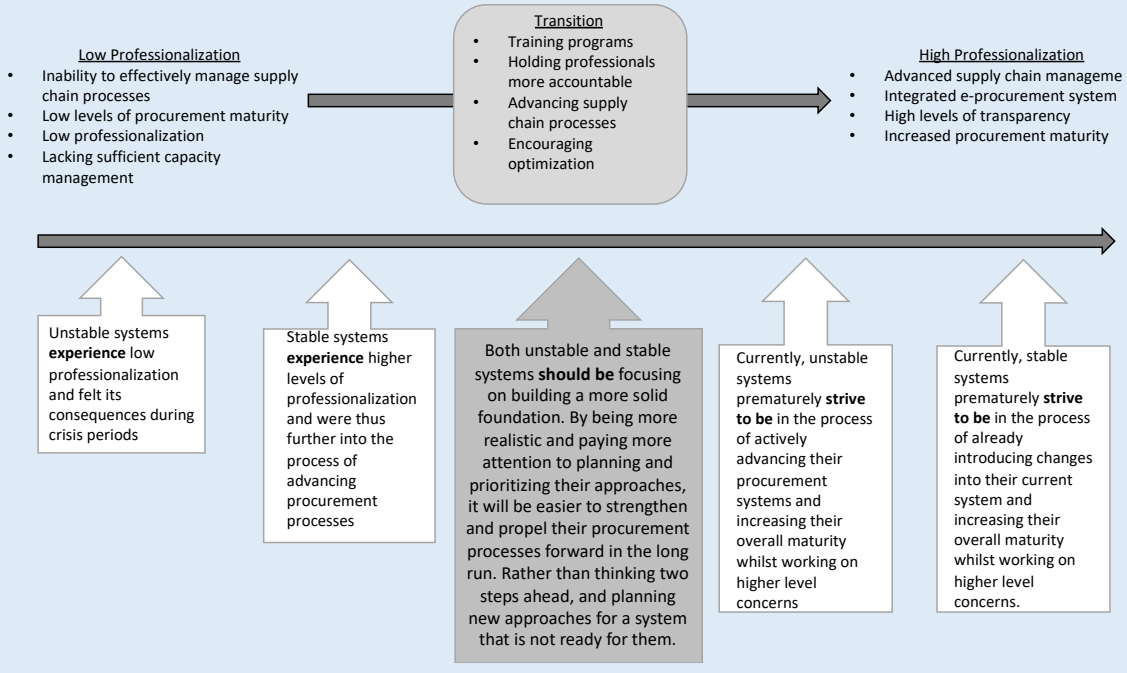
[6] https://www.nu.nl/economie/6168181/stichting-van-sywert-van-lienden-maakte-bijna-9-ton-winst.html

Reflections on the Netherlands regarding supply side issues

Supply side solutions and their corresponding challenges encountered internationally correspond to the challenges identified by the Dutch interviewees. The effectiveness of framework agreements and supplier relationships were questioned, whereas collaborative buying was under-utilized because it was proven to be difficult. The last three measures (dual sourcing, stockpiling and local industry) were popular measures as ways forward, but interviewees are critical about high costs and attainability of these measures.

Highlights of skills and competences

Nearly all the interviewed experts alluded to the importance of professionalization. Professionalization became a benchmark to understanding the maturity of a procurement system. We formed a maturity hierarchy using the data, revealing the factors that experts from different regions felt were most important for the future. Portraying this, the chart below shows both unstable (fragile systems, without professional backing) and stable systems (solid foundations, with professional backing) and their perceived suitability within the procurement realm. Unstable systems, for example, with low professionalization, bore the consequences of their underdeveloped toolbox. However, stable systems, that had high levels of professionalization, were slightly further in the processes of advancing their procurement processes. It is interesting to note however, that when both systems discussed the future, they seemed to be multiple steps ahead of what was realistic for each individual system. Both systems were prematurely striving for procurement above their capacity. Countries should be focusing on nurturing their foundation and preparing by taking steps that might eventually lead them to a more professional, advanced environment.



Reflections on the Netherlands in relation to skills and competences

Similar to the findings from the international research, it appears that Dutch interviewees tend to be multiple steps ahead of what was realistic for their procurement system. Interviewees are prematurely striving for procurement systems well above their current

capacity. Learning from the international experts we conclude that the Netherlands too should focus on the next step ahead, gradually leading them to a more professional and advanced environment.

Highlights of information systems

The interviewed countries fall under various dynamic stages that change based on internal (involvement of people within) and external pressures (involvement of both public and professional bodies), as witnessed during COVID-19. Similarly, countries are not necessary completely in one stage. We found examples of countries (especially in Northern and Western Europe) that focus and improve tremendously in levels 3 and 4 but tend to miss out on the important aspects of level 2, such as "the easiness of usage," or even stage 1, which entails using information and electronic systems for its proposed purpose.

Stage 1	**Introducing electronic systems for efficiency and combatting corruption** • Efficiency • Combating corruption • Strengthening the internet • Changing attitudes
Stage 2	**Easy to use electronic system applicable in times of crisis** • Transition from stability to crisis • Integration and standardization across the country • Stock availability across the country • Shifting focus from law to efficiency and usability • Usage of excessive data and information
Stage 3	**Increasing understanding of the supply chain, demand, and supply through electronic systems** • Gaining a deeper understanding of the supply chain • Transparency • Accurate demand and supply forecasts through data
Stage 4	**Fully integrated electronic system, based on real time data** • Integrating planning, tendering, catalogues, economic, and monetary evolutions

For some countries, there seems to be a mismatch between the challenges they encountered during COVID-19, and the identified future strategies. Except for interviewees from African countries and some Asian countries, many interviewees acknowledged challenges that correspond to our stage 2: main issues during the crisis were with the usability and efficiency of electronic systems in times of crisis. Interestingly, the challenges do not necessary align with the focus for future preparedness, as the focus for future preparedness often shifted towards more advanced electronic systems, with the increased need for transparency and more accurate forecasts based on real-time data.

Reflections on the Netherlands regarding information systems

Like other Northern and Western European countries, we found a mismatch between where the current information system challenges lie in the Netherlands, and the improvement opportunities mentioned by stakeholders in the interviews. We argue the Netherlands

corresponds with the challenges related to stage 2 in the framework, while apparently focusing focuses on improving future opportunities regarding stage 3.

4.2 Clustering procurement challenges and future preparedness priorities

Reporting on the evidence from the 33 countries on their obstacles, problems, and strategies of crisis procurement issues, we clustered countries according to similar (main) procurement challenges in Part II. We identified five clusters with similar main challenges and hence similar priorities for better preparedness. These clusters are (categorized according to their main challenge or challenges):

1. Insufficient procurement professionalization
2. Regulatory hurdles
3. Strained harmonization endeavors
4. Striving to enhance supply chain knowledge
5. Collaboration and coordination obstacles

When we interviewed multiple experts from one country, we noticed that their view on the challenges was highly similar within a country, but their proposed actions were more diverse. As such, we clustered according to the challenges of a country, whist providing a wide view of proposed actions on expert level. By clustering countries with similar challenges, one can (more easily) learn from other countries' expert opinions. Countries that fall within one cluster did not necessarily perform better than countries within another cluster. This also does not indicate that countries did not have challenges regarding other clusters. Moreover, it indicates the bottleneck (the biggest challenge) of the cluster: where the biggest gains can be made, according to experts from those countries. Table 1 depicts the five different clusters that emerged from dataset, with their corresponding challenges and countries.

Table 1. Summary of the five different clusters with their corresponding challenges and countries.

Cluster A. Insufficient procurement professionalization	Challenges	• Procurement professionalization • Electronic procurement • Corruption and ethical issues • Foreign dependency, Geographical location, currency problems
	Countries	ETH, RWA, ZAF, UGA, ZWE
Cluster B. Regulatory hurdles	Challenges	**B1** • No existing legislative backbone • Rigidity of regulations required simplified and limited procedures **B2** • Chaos • Transparency • Corruption • Regulations have an image of ineffectiveness
	Countries	ESP, IND, HUN, POL, SRB, RUS
Cluster C. Strained harmonization endeavors	Challenges	• Costs & security trade-off • Mismatch knowledge & Power • Understanding the procurement system, processes, and interactions
	Countries	BGR, HRV, SVN, PRT, ROU

		BEL, FRA, DEU, WLS
Cluster D. Striving to enhance supply chain knowledge	Challenges	• Challenges relatively small • Advanced improvements • Increase supply chain knowledge • Understanding redundancy • E-procurement enhancements • Supporting government objectives • Shift in mindset and training
	Countries	ISL, NZ, CAN, IND, SWE, ITA NOR, FIN, AUS, BTN, SCT, IRL
Cluster E. Collaboration and coordination obstacles	Challenges	• Decentralized healthcare structure • Lack of trust • Resistance in sharing • Differences in training and regulation between states
	Countries	US

Positioning the Netherlands in the cluster analysis

We position the Netherlands in cluster C; a cluster that deals with strained harmonization efforts. It is apparent that countries within this cluster dealt with a multitude of stakeholders and varying coordination difficulties. In this cluster the disconnect between various themes caused friction on many fronts. Countries in Cluster C experience difficulties in terms of collaboration efforts, comprehending the complete procurement process, and integrating various parts and systems. Whilst positioned in Cluster C, the Netherlands also partially relates to the challenges of countries in Cluster D, with similarities in the maturity of the procurement processes.

While we positioned the Netherlands primarily in Cluster C, in the interviews with Dutch stakeholders, many have referenced future opportunities that lie within cluster D. This is interesting as this corresponds to the disconnectedness discussed above: there is a mismatch between where the challenges lie (Cluster C), and what experts acknowledge as future opportunities (Cluster D). Hence, instead of focusing on multiple steps ahead, the Netherlands should focus on the next step ahead, gradually leading them to a more professional and advanced environment.

4.3 Consideration of contextual influences outside of procurement

In the clustering of countries based on the main challenges and obstacles experienced, it is important to recognize these difficulties are not solely based on internal processes. External factors may also play a vital role in the extent to which a country was affected by COVID-19 in the first place, and the potential of a country to effectively deal with consequent worldwide shortages. In Part II we identified two important factors: the level of wealth of a country and its geographic connectedness. We argue wealthy countries may have a better starting position – in terms of necessary conditions – both to deal with a pandemic now and to improve their preparedness for a future crisis. Wealth also likely correlates with public procurement maturity: the development level of the public procurement function of a country. In addition to this, geographic connectedness relates to the difficulty of fighting an infectious disease such as the COVID-19 virus. Isolated countries may be better positioned to control a virus, but this isolation may also be the cause of various negative effects, such as

importing challenges. Due to the complexity and relevance, external factors have also been explored.

There appears to be a strong distinction in wealth (measured by Gross Domestic Product per capita – GDP PPP) within the clusters. The average level of wealth in countries in cluster B is higher than the countries in cluster A, it is higher for countries in cluster C compared to cluster B, et cetera. This is possibly because wealthy countries have advantages in procurement maturity prior to COVID-19 as well as opportunities to invest in improving preparedness.

At the same time, a large difference was observed in the number of "neighboring countries" within different clusters. First, it appears that countries that are more isolated (cluster D) are affiliated with different strategies and challenges than other clusters that withhold countries that are less isolated (e.g., cluster B). African country experts, for example, reported a combination of challenges that often came down to their geographical location, making it difficult to import medical materials. Thus, the geographical location of many African countries has been shown to have a significant influence on their challenges. Countries that do not have their own harbors or well-established air freight hubs faced a major additional challenge for inbound logistics. At the same time, the more isolated the countries are, the more independence they displayed. The focus on their individual state meant that it became easier to avoid interference from outside, allowing for more creativity in their strategies.

Table 2. Overview of external influences per cluster

	Number of countries in cluster	Neighboring countries	GDP -PPP (Wealth)
Cluster A: Insufficient procurement professionalization	5	5	4,747
Cluster B: Regulatory hurdles	6	8,3	26,680
Cluster C: Strained harmonization endeavors	10	4,8	40,125
Cluster D: Striving to enhance supply chain knowledge	11	1,45	48,48
Cluster E: Collaboration and coordination obstacles	1	2	63,413

Wealth and geographic connectedness of the Netherlands

The countries in cluster C share a border with on average 4,8 other countries. The Netherlands shares a border with two other countries[7], which fits better to the external characteristics of cluster D. The average wealth of countries in Cluster C in 2020 was $ 40.125 per capita. The GDP for the Netherlands was $ 59.268 per capita in 2020.[8] Within the Cluster C, the Netherlands is positioned *better than average* in terms of wealth and connectedness, and might (contextually) fit better to Cluster D.

[7] Not taking into account Dutch overseas territory, if this is included the Netherlands shares a border with three countries.

[8] Data from World Bank, 2020.

4.4 Connecting external threats and opportunities with internal weaknesses and strengths.

To summarize the varying clusters regarding their broader contexts, the internal and external factors were analyzed in tables loosely based on a TOWS analysis. This analysis is an extension of a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis; it supplements the analysis with strategies and varying perspectives that can be utilized to explore the different factors that exist in an environment. The varying factors used in a TOWS analysis are broken into the identification of threats and opportunities (external factors), and strengths and weaknesses (internal factors), which work together to explore how these factors impact each other. The combination of this leaves us with four perspective strategies. The matrix below is the TOWS analyses for Cluster C, which is displayed to understand the positioning of the Netherlands within this cluster.

Understanding cluster C

Table 3. TOWS matrix for Cluster C: Strained harmonization endeavours

Internal Factors / **External factors**	**Strengths** • Educated, well trained professionals scattered throughout the system • Mature, advanced procurement system that is willing to develop and advance	**Weaknesses** • Inability to understand who is truly in charge • Not comprehending the complete procurement system, processes, and interactions
Threats • Cutbacks in healthcare financing • Lack of collaboration between buyers and other stakeholders on the buying side	ST • Due to the lack of harmonization between and within system(s), understanding how legislation fits into the system becomes extra important	WT • A disconnect is created between the knowledge of professionals and those who hold decision-making power
Opportunities • High wealth within countries	SO • Ability to effectively integrate electronic systems into the current system	WO • Trade-off between costs and security within system processes is realized

Positioning the Netherlands in Cluster C

Cluster C focusses on collaboration efforts, comprehending the complete procurement process, and integrating various procurement systems. These strategies resonate well with the challenges the Netherlands encountered during COVID-19. In the context of a highly decentralized health care system and without pre-existing crisis structures for this purpose, coordination and governance were very challenging. Due to suboptimal communication and coordination, in combination with unclarity about the national approach, challenges care providers experienced during this time led to a lack of confidence and trust in newly established national structures, national bodies' approaches to the crisis, and their subsequent strategies. This closely relates to the threats faced by countries in Cluster C which

regard collaboration issues in the external environment and reflects on the inadequate harmonization efforts that the overarching Dutch healthcare structures displayed.

As time passed, high degrees of flexibility were seen in procurement processes within the Netherlands. This was practical and advantageous in managing the crisis and preventing shortages, but also led to negative consequences. This reflects on the difficulties of comprehending the complete procurement system

The interrelated difficulties that led the Dutch procurement system to a new level of complexity, correspond to challenges encountered by other countries in Cluster C. They relate to the trade-off between costs and security (higher levels of security, for example by taking high safety stocks, leads to higher structural costs), but also the disconnect between knowledge and power (those who have decision making power in the system are not the subject matter experts). However, as Cluster C explicates, countries found in this cluster also displayed external opportunities, and internal strengths. For the Netherlands this regarded the wealth in the country (external opportunity), the educated professionals scattered throughout the system (internal strength), and its mature procurement system that is willing to develop and advance procurement systems (internal strength).

Cluster C recommended strategies for the Netherlands

In the disconnect created between the knowledge of professionals and those that hold the power, the Netherlands needs to provide clarity in terms of task divisions in their crisis protocols and be clear in the creation of criteria that decides when crisis protocols are necessary to be implemented. Taking these precautions in the hopes that all stakeholders involved are adequately informed and guided ensures a clear direction is taken. In the Dutch crisis trajectory this was not presented as such, due to the entrance of new bodies in the market, and the ambiguity that came with who would benefit from them. It is to be noted that these decisions are to be taken by political legislative bodies, because even when a country displays enough knowledge it does not mean they are able to lead the country in the right direction. These boundaries need to be clarified.

Adding onto this, with the trade-off between costs and security we come to understand that the Netherlands also needs to take note of the fact becoming less dependent on foreign networks and suppliers leads to making more costs, and thus investing more in local professionals and goods. This too often comes down to political decision making. Some regulations may lead to more security (safety stocks; increase of security but costly), and some regulations and legislative protocols may lead to more costs (increasing number of contracts; decrease of security but less costly). Questions that need to be asked here include what a governing body is able, and willing to pay for.

The position of the Netherlands regarding Cluster D

The Dutch procurement system also relates to certain characteristics of Cluster D countries. These characteristics include the wealth of the country in combination with a mature purchasing system. The main challenges, however, do not correspond well with the countries of Cluster D. Rather, the main challenges lie within Cluster C: focusing on harmonization efforts within the procurement system. Therefore, the Netherlands should be careful to focus first on the on the more imminent challenges and strategies within Cluster C.

4.5 Applying three overarching recommendations to the Netherlands

In MaSSC Part II, we provide the three most essential takeaways, independent of the challenges encountered during COVID-19. Below, we discuss these take-aways, and what they mean for the Netherlands.

1. Balance between professionalization and regulations

The interviews with 45 experts result in evidence of a wide variety of challenges, procurement approaches, and issues with rules and regulations – influenced by external factors and current levels of procurement professionalization among the countries included in this study. Whereas these are often discussed as independent factors, they are in fact interrelated. As shown in table 4, high professionalization cannot succeed with a limited legislative backbone. However, a flexible and advanced legislative backbone will likely result in chaos and high risk for corruption. Hence, the optimal position and balance is found at the intersection of legislative flexibility and high professionalization.

Table 4. Balancing gradations of legislation and professionalization

	Low professionalization	High professionalization
Limited legislative backbone	Chaos, room for corruption, confusion amongst professionals	
Rigid legislative backbone	No innovative and flexible ideas and objectives	Difficulties implementing innovative and flexible ideas
Flexible legislation backbone	Chaos, room for corruption, minimal usage of legislative opportunities	Ideal position: Understanding how creativity and legislative backing are intertwined

Reflections on the Netherlands

In stable times, the Netherlands can both rely on a well-established highly professional public procurement sector, and in on an advanced legislative procurement backbone, both nationally and as a member state of the European Union through EU directives. However, during the COVID-19 crisis, the Netherlands leaned more towards the countries that steered away from strictly following regular procurement procedures, therefore shifting upwards in the table. This resulted in discussions on the legality of certain deals in the aftermath of the crisis. The Netherlands should learn from the COVID-19 crisis to critically reassess the emergency procedures within its public procurement legislation. How can procedures and the criteria for invoking them allow for an optimal balance between the legal room to maneuver in times of crisis, and the principles of public procurement law such as transparency and equal treatment of economic operators?

2. Balance between knowledge and power

Experts have indicated that there is a disconnect between knowledge and power. The responsibility and executive power often lie within the government; however, experts argue that procurement knowledge is often not in the same place. Hence, many experts argue that knowledge and power should be aggregated to better handle future pressures on the supply

chain. This balance can and should be restored either through expertise mapping, shifting the power to where the knowledge is, or shifting the knowledge to where the power is.

Reflections on the Netherlands

Within the Netherlands, the expert knowledge on buying PPE is mostly positioned in the care and cure institutions and in the procurement collaborations between the care and cure institutions. The central government had close to zero experience with procurement of medical materials. Hence, the move towards a centralized procurement organization came with challenges related to the mismatch between knowledge and power, such as coordination, setting up protocols, and managing expectations among health care organizations. Insights from MaSSC Part II add to this perspective, by first of uncovering this problem, but secondly, by providing the opportunity for expertise mapping: allowing for a quick identification and mobilization of the required skills and competences.

3. <u>Balancing what needs to be done now, and what needs to be done in the future</u>

Within the expert interviewees preparedness opportunities were discussed at length, focusing on the future and the direction in which countries were striving to propel themselves. However, in many settings, forward thinking included utopian views on what public procurement could look like, thinking five steps ahead rather than the next step. For example, whereas in some countries information systems were not compatible during the crisis, many interviewees argued information systems should be fully integrated and provide more transparency in the supply chain. Hence, skipping the current problem for enhanced advancements. Hence, we argue that more time should have been put into the “now,” and the “here”.

Reflections on the Netherlands

Translating this final perspective to the context of the Netherlands, the most prominent lesson for the Netherlands is to consider the six recommendations from MaSSC report I in relation to each other. Where we identify several countries are ‘reaching for the stars’, the Netherlands should put their energy in balancing the different strategies for improvement. To illustrate with an example provided in Part I: there is no use in having high safety stocks if a strategy and organization for distributing them in the next crisis is not in place. There is no use in having a centralized procurement organization for the next crisis, if the healthcare organizations do not trust it and again move into ad hoc ‘firefighting’ mode.

By understanding these recommendations in relation to each other, we recommend the Netherlands to focus implementing these changes while grasping their interrelated nature. By doing so, the complex challenges that COVID-19 has brought the Netherlands will hopefully be put in perspective and become a focus for future improvement. By lightly treading forward without feeling as if procurement should be further ahead in the country’s development journey, one can more easily focus on what needs to be done in order to prepare for the new normal.

4.6 Conclusion

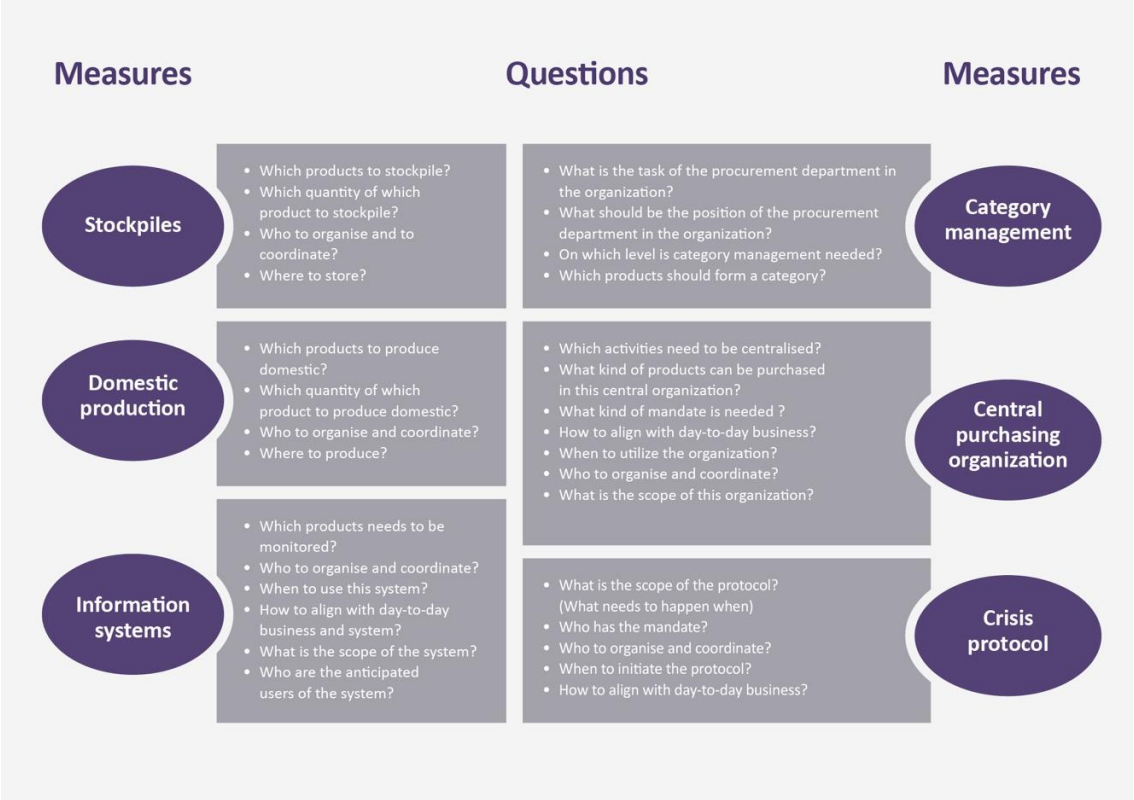
The COVID-19 pandemic exposed weaknesses in healthcare systems around the world. Insufficiencies in the supply of personal protective equipment and other medical equipment

took center stage as one of the critical problems. The catchphrase “Never waste a good crisis” was ushered frequently throughout the COVID-19 crisis. In the context of the procurement and distribution of scarce medical supplies, this catchphrase illustrated the sense of urgency for improving crisis procurement and supply management strategies. “Never again” should our healthcare systems be restricted by shortages of the most elementary of medical materials.

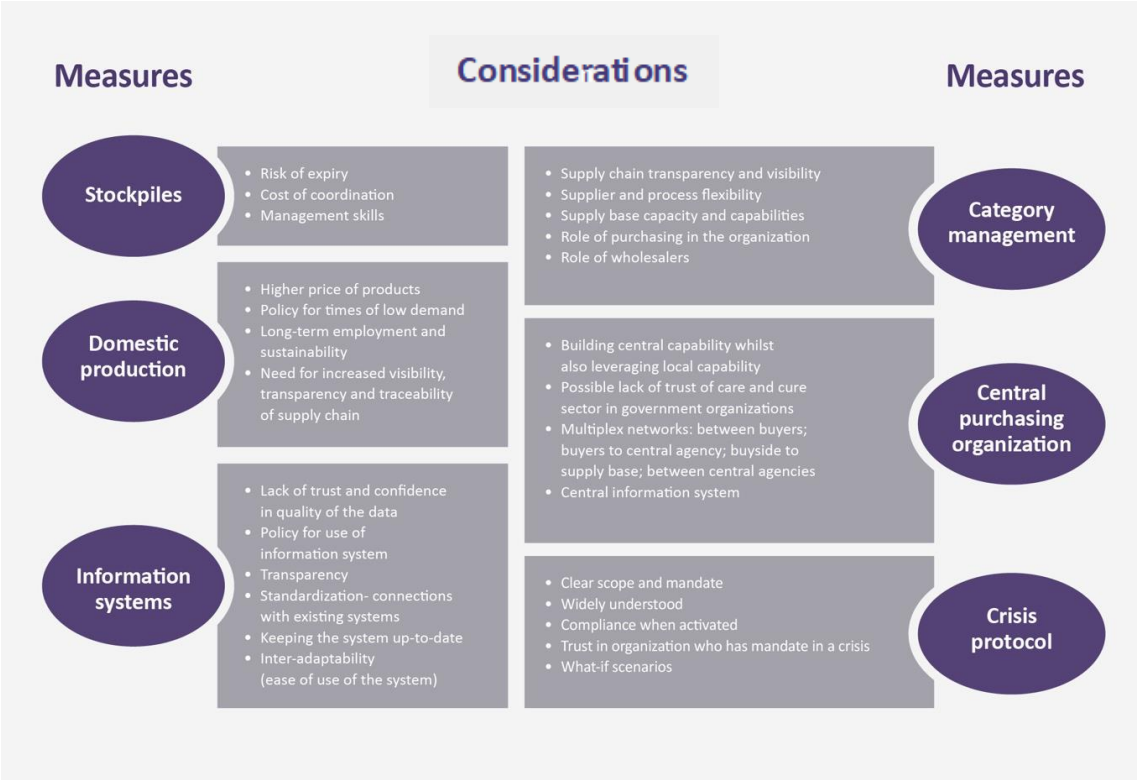
It is our aim with this research to contribute to this wide shared goal, both in the Netherlands and abroad. When the sense of urgency dissipates and health budgets normalize, countries should have taken the necessary steps to improve their public procurement preparedness for the next crisis – as it will inevitably hit us by surprise. The three MaSSC reports provide a clear overview of measures and priorities for countries, with a special emphasis on the Netherlands in the first and third report, to work towards a resilient public procurement system.

Appendix 1: Six measures and associated questions, consideration and actions summarized

Corresponding questions to the possible measures



Overview of the considerations for each measure:



Overview of which approaches could be taken for each measure: