

IAPH-WPSP Port Economic Impact Barometer One Year Report:

A survey-based analysis of the impact of COVID-19 on world ports in the period April 2020 to April 2021

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Foreword

Ports are vital economic hubs that connect sea and land supply chains. Estimated at over 11 billion tons, the cargo that enters and leaves ports accounts for over ninety percent of goods traded worldwide. The role of ports in ensuring the continued supply of food, fuel, raw materials and medical supplies as well as essential manufactured goods was amplified by the outbreak of the global COVID19 pandemic.

As the COVID19 pandemic began spreading from the Far East to the rest of the world, the International Association of Ports and Harbors (IAPH) decided to recruit a World Ports Sustainability Program Taskforce of experts amongst its members. By actively sharing updated information, best practices could be quickly established and offered to ports responding to the crisis. In addition, the aim was to support and offer expert guidance based on real life experience to mitigate the impact of the pandemic as it spread on ports' personnel, operations, commercial activities and their communities.

A regular report on the status of world ports and the impact of COVID19 based on a simplified and structured survey was created and established by two key members of the WPSP Taskforce, namely Professors Theo Notteboom and Thanos Pallis. As highly experienced port economists, they have been able to analyze the regular survey responses from ports to structured questions and inform the ports sector and beyond on the impact of COVID19 on world ports. We owe them and the Taskforce a debt of gratitude together with the world's port community that took time out to respond regularly to the survey.

This IAPH-WPSP Port Economic Impact Barometer report is a summary of all seventeen surveys. The first survey was

released on 9th April 2020 and was kept on a weekly basis during the early stages of the global pandemic. As with the reports that have preceded it, this Barometer is based entirely on information provided to us by the ports worldwide. It will form the basis of a new global ports tracker currently being developed by the Risk and Resilience Technical Committee of IAPH together with industry partners. The aim has been ambitiously set to use the tracker to monitor trends, mitigate risks, alleviate impacts of future disruptions and help build resilience up in the ports sector as we move to the post-COVID19 era.



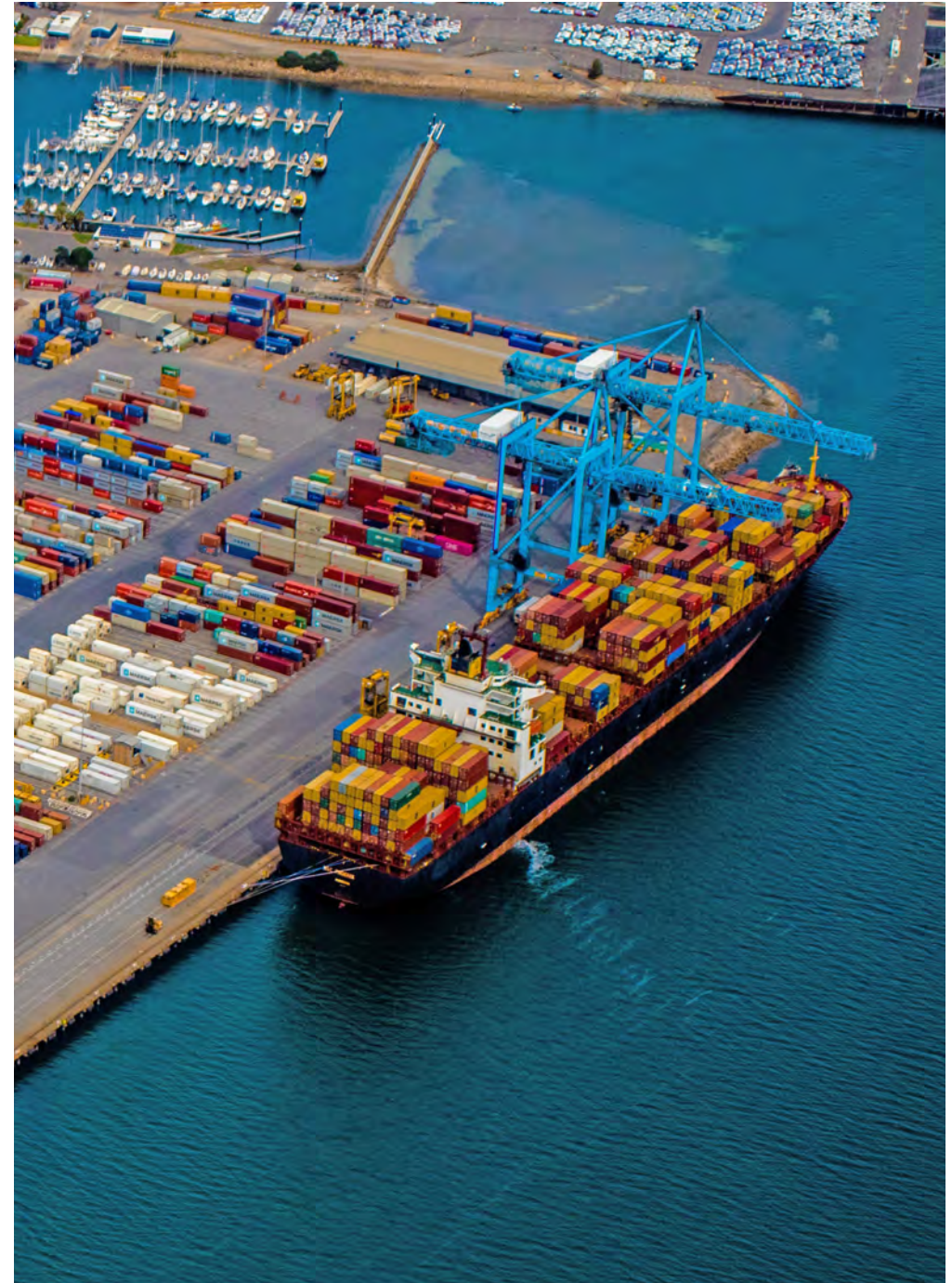
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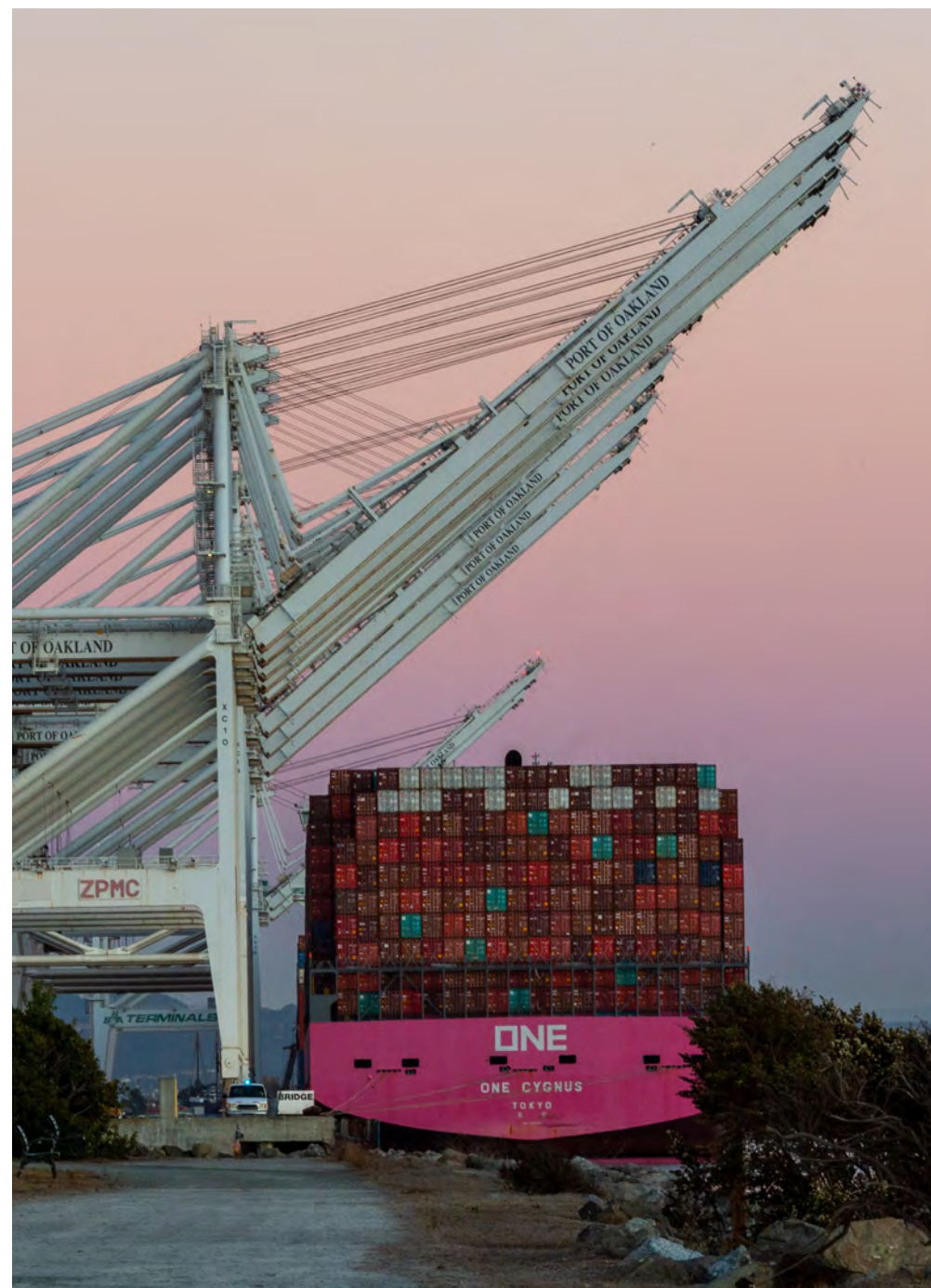


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1. Theme setting

The COVID-19 pandemic led to the second global crisis since the 2009 financial crisis with a significant impact on global supply chains at every level, including the port and shipping industry. The pandemic COVID-19 is unfolding in several phases.

The first phase in early 2020 consisted of a supply shock in China where lockdown measures resulted in a de facto extension of sharply decreased Chinese production during their New Year period. The lockdown affected most of the workforce and curtailed the industrial base between mid-January and early March 2020.

The second phase began in mid-March 2020 and consisted of a (global) demand shock. The lockdown and semi-lockdown measures implemented worldwide resulted in a decline in global derived demand due to lower consumer and industrial confidence and limited retail activity. The lockdown of a large consumer base removed people from the active workforce and shifted consumption patterns to essential goods (food and personal items). The suspension of travel, tourism (such as cruising), and the entertainment industries, as well as the temporary closure of bars and restaurants, further depressed consumer demand. The lower economic activity level and uncertainty about the path to economic recovery also generated a steep drop in the price of several commodities, such as petroleum.

In the third phase, many regions worldwide started to relax the COVID-19 measures, with most economic sectors resuming activity. However, deferred demand levels remain uncertain. New local outbreaks of the Coronavirus, particularly in developing economies such as Brazil and India, and the second and even third waves in several countries resulting in new forms

of restrictions on economic and social life, have further affected demand. Since the summer of 2020, demand from Asia to the rest of the world - most notably on container trade lanes - started to surge as a result of restocking strategies of companies and strong sales of durable goods such as office equipment, furniture, and electronic devices.

The world economy has yet to reach the final phase, which will encompass a clear and consistent recovery and a return to normal demand patterns. When such a recovery phase commences, it might go hand-in-hand with an increased risk of protectionism to support national production. Moreover, nearshoring and reshoring strategies are being considered to reduce the dependence on overseas

production, develop essential economic activities at the regional/local level, and increase supply chain resilience.

Port demand is a derived demand. A sudden drop or increase in demand has an immediate impact on port activity levels. In March 2020, the World Ports Sustainability Program (WPSP) and International Association of Ports and Harbors (IAPH) set up a COVID-19 Task Force to monitor these impacts and facilitate information exchange between ports on procedures and practices to deal with COVID-19. Soon after its inception, the IAPH-WPSP COVID-19 task force took the initiative to launch an “IAPH-WPSP Port Economic Impact Barometer” to gather information on the short-term impacts of COVID-19

on ports covering vessel calls, hinterland transport, distribution activities, procedures, and staff availability. In early 2021, the newly-established Risk and Resilience Technical Committee of IAPH incorporated the work of the COVID-19 task force. In the past year, sixteen Barometer reports have been prepared by port economists Theo Notteboom and Thanos Pallis based on a survey among world ports.

This report analyses and summarizes the main trends and findings of the IAPH-WPSP Port Economic Impact Barometer. The results of the past 16 Barometer reports are revisited, while an update on the current situation is provided through an additional survey round for week 15 of 2021 (mid-April 2021).



2. The survey set-up

The IAPH-WPSP survey on the impact of COVID-19 was launched in early April 2020 to monitor the current situation in world ports and trends compared to previous weeks. The survey was sent to port authorities and port operators with responses received anonymously on a weekly basis. The first survey results were collected in week 15 of 2020 (April 6). The survey initially involved asking six questions repeatedly, each associated with a scale of potential answers:

1. How would you best describe the number of vessel calls in your port in the past week, compared to what would be expected in the same week under normal conditions for this period?
2. Were there any extra restrictions on vessels introduced in the past week for either cargoes or ship crews?
3. Were there any extra delays during the past week due to changes in port call procedures (hygiene inspections, distancing of workforce, disruption of port or related services etc.)?
4. How has hinterland transport been affected by the COVID-19 situation compared to normal activity during the past week?
5. What is this week's situation in terms of capacity utilization, including warehousing and distribution activities in your port?
6. What was the availability of port workers last week?

From week 23 onwards, the survey has been sent out on a bi-weekly basis, and the number of questions has been reduced to four, thereby omitting questions 2 and 3 on restrictions on vessels and port call procedures.

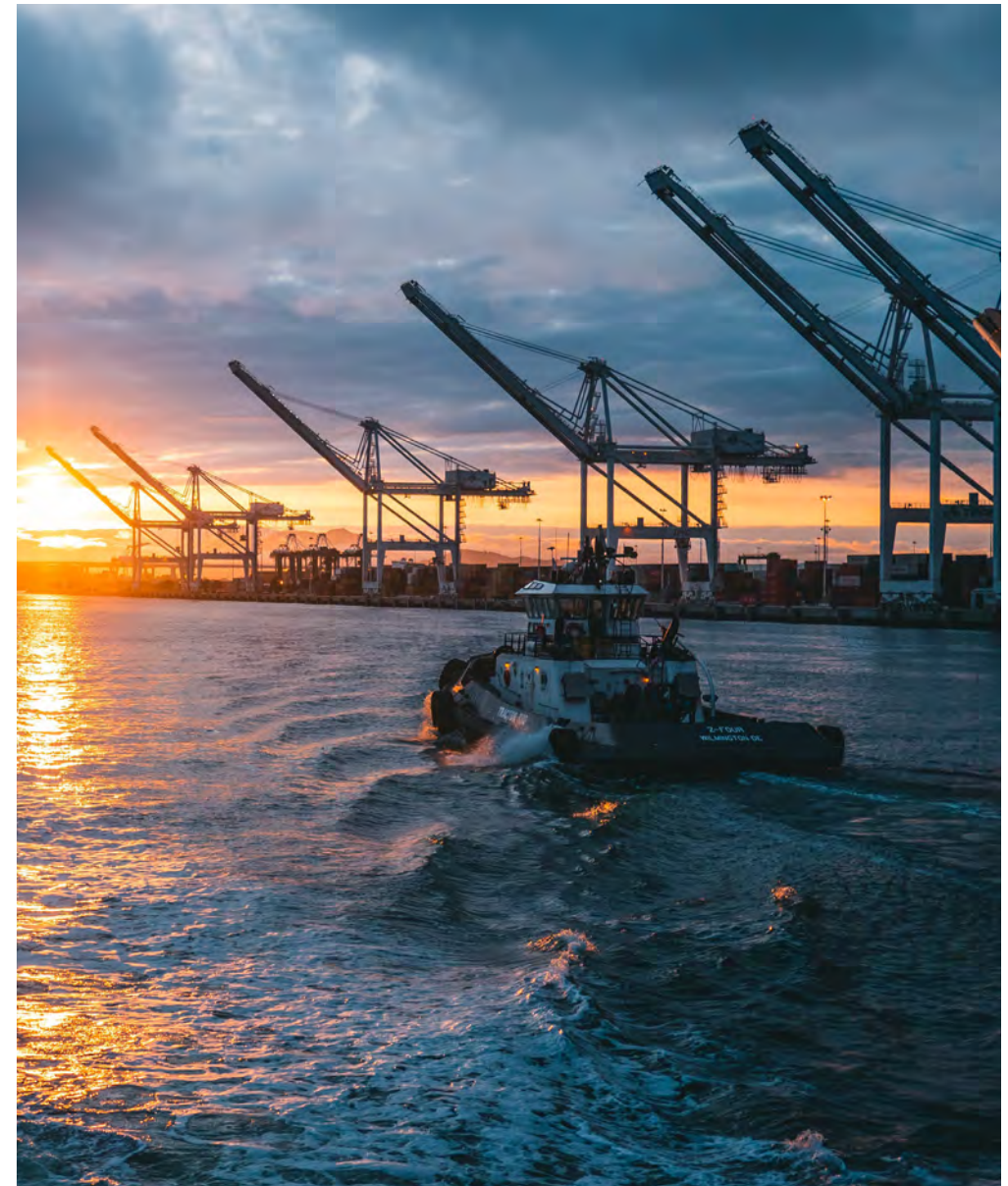
On top of these four themes, several questions appeared one or a few times in the Barometer reports:

- A fifth question was added in weeks 27 and 29 of 2020, dealing with the status of crew changes in ports. This question was also included in week 6 of 2021.
- One question on the status of planned port infrastructure projects was added in the week 36 survey (September 2020). This question reappears in the survey round of week 15 of 2021.
- In week 41 (October 2020), the Barometer focused on the trends observed in planned investments in environmental sustainability.
- In week 45 (November 2020), a question was added dealing with the ports' cargo throughput compared to the same period last year.
- In week 50 (December 2020), the additional question dealt with the share of empty containers in total container throughput, given the equipment availability crisis on some major trade lanes.
- In the latest survey (April 2021), several questions were included to assess the impact of the Suez Canal Blockage in late March 2021 (i.e., the 'Ever Given' incident) on ports.

The 11th report, published in mid-July 2020, was initially planned to be the last Barometer report. However, a resurgence of COVID-19 cases in many countries around the world and the emergence of a first wave in several other countries lead the IAPH COVID-19 Task Force to decide to reinstate the Barometer exercise, this time on a monthly basis. Starting from 2021, the frequency was further reduced to one report every two months. Next to looking back at past survey results, the current report also includes the results collected in week 15 of 2021 (mid-April 2021).

The 16 previous reports and associated press releases can be downloaded from the World Ports COVID-19 information portal:

<https://sustainableworldports.org/world-ports-covid19-information-portal/>.

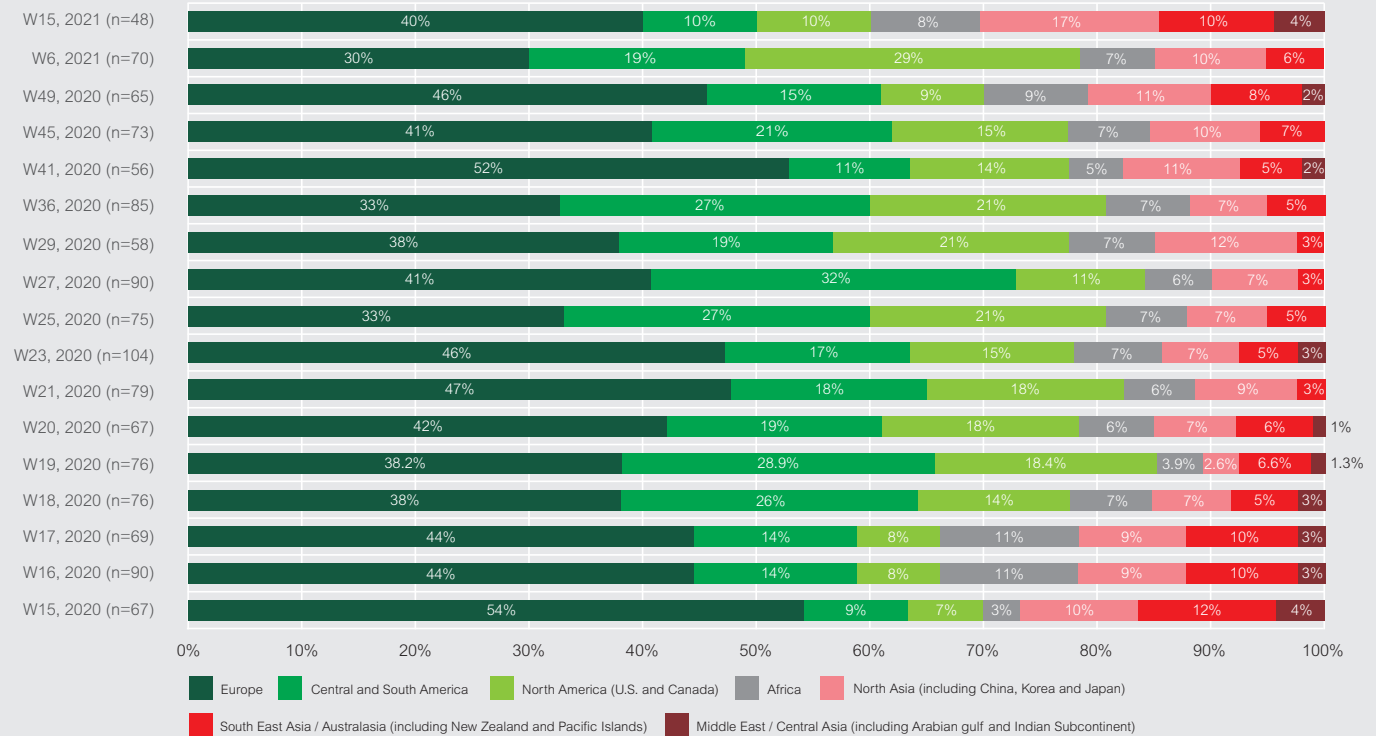


3. Participation level of world ports

The total number of valid answers varied throughout the survey period between 48 and 104. From week 15 to 21, the number of responses fluctuated between 67 and 79, with an outlier of 90 in week 16. In week 23, a peak of 104 answers was recorded. Only 58 valid answers were received in week 29, which could be explained by the holiday season and some signs of survey fatigue. The lowest number of responses was recorded in April 2021, with 48 valid answers.

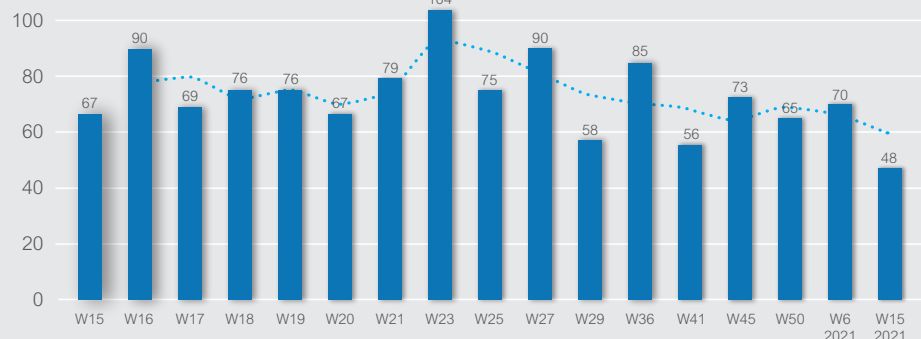
Throughout the survey period, Europe remained the leading region with between 30% (week 6 of 2021) and 54% (week 15 of 2020) in the total. The number of responses received from Central and South American ports increased significantly from week 18 onwards. However, the participation of this region dropped suddenly in a few survey weeks (such as in October 2020 and April 2021). North America was represented well in mid-2020 (21% share) and in February 2021 (29%), with its share fluctuating between 10 and 15% in most other weeks. A limited number of ports from North Asia, South East Asia, and Australasia took part in the surveys, but the ones who participated did so consistently. Except for April 2020 and April 2021, the share of these regions in the total never exceeded 20%. African ports remained under-represented throughout the entire Barometer exercise, while answers were received from ports of the Middle East or Central Asia on an occasional basis only.

Geographical distribution of responses to the survey



By: Theo Nottboom - Thanos Pallis

Number of replies per survey



By: Theo Nottboom - Thanos Pallis

4. The Dashboard: the survey results at a glance

The results of the Barometer are summarized in the Dashboard. The percentages indicated in the blue bars of the Dashboard highlight the level of impact of COVID19 contagion on world ports based on the responses to the main questions of the survey, subdivided into relevant categories (vessel, modal, cargo, and port worker). The results on the crew changes, planned port infrastructure projects, Suez Canal blockage, etc. will be discussed using separate graphs. You can find comprehensive data and more detailed explanations of responses to all questions in separate sections in this report. The analysis also includes a regional comparison between the regions with the highest number of responses, i.e., Europe, Central and South America, and North America.

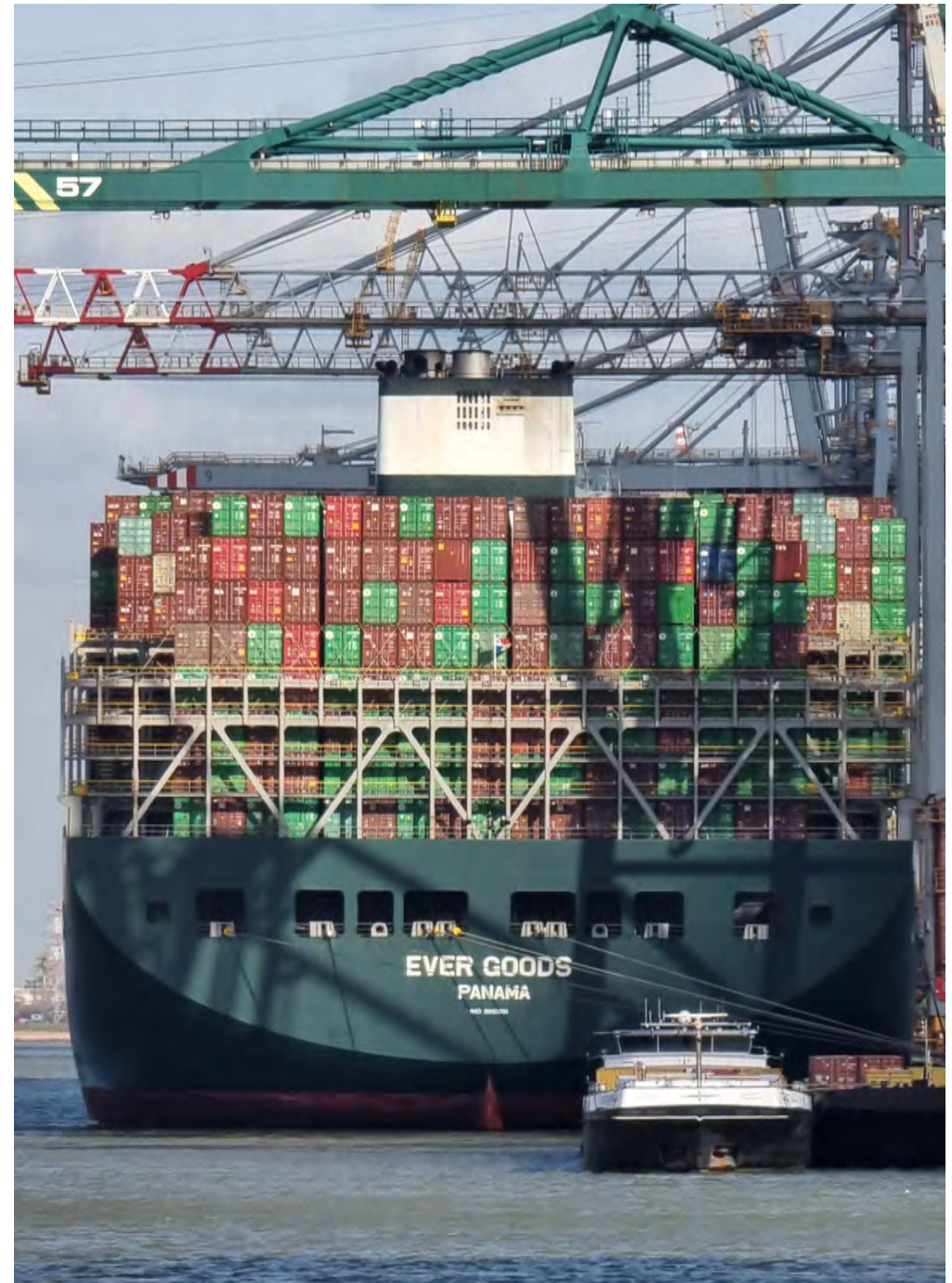
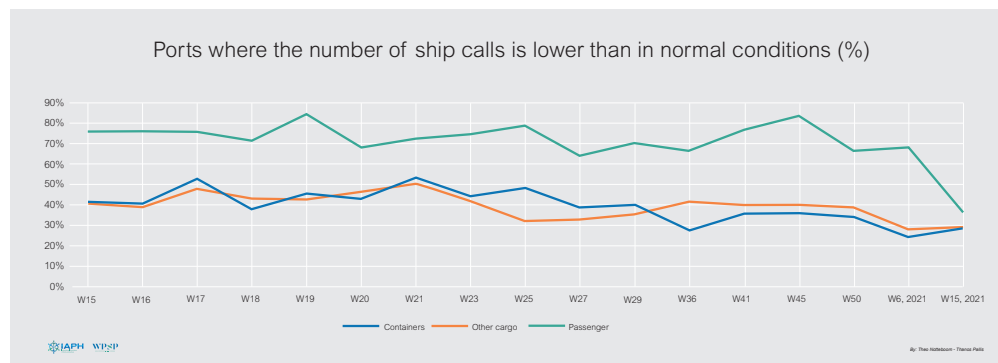
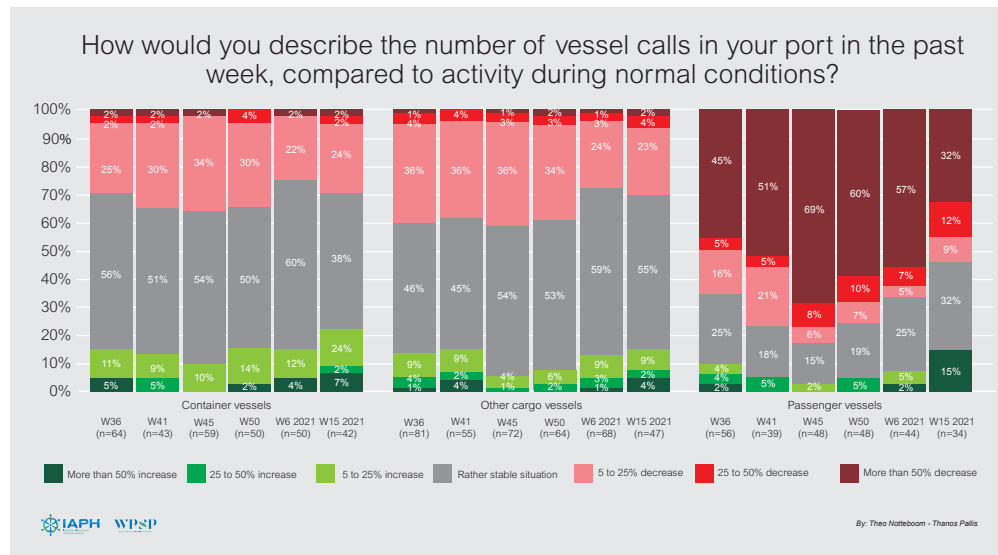


		Week 15 April 06	Week 16 April 13	Week 17 April 20	Week 18 April 27	Week 19 May 05	Week 20 May 12	Week 21 May 19	Week 23 June 02	Week 25 June 16	Week 27 July 01	Week 29 July 15	Week 36 Sept 02	Week 41 Oct 08	Week 45 Nov 08	Week 50 Dec 07	Week 6 Feb 12, 2021	Week 15 Apr 15, 2021
Ports with decline in vessel calls (last week compared to normal conditions, %)	Container vessels	41%	41%	53%	39%	45%	43%	53%	45%	48%	40%	40%	28%	35%	36%	34%	24%	29%
	Other cargo vessels	41%	39%	47%	44%	42%	46%	51%	42%	33%	33%	37%	41%	40%	40%	39%	28%	30%
	Passenger vessels	77%	77%	76%	71%	85%	68%	73%	74%	78%	64%	70%	66%	77%	83%	76%	68%	53%
Ports with extra restrictions on vessels (last week, %)	Container vessels	49%	22%	33%	20%	19%	10%	7%										
	Other cargo vessels	47%	23%	34%	25%	20%	6%	12%										
	Passenger vessels	51%	38%	31%	26%	25%	17%	16%										
Port call delays due to extra procedures (last week, %)	Container vessels	42%	35%	33%	27%	27%	18%	17%										
	Other cargo vessels	35%	28%	32%	30%	25%	20%	19%										
	Passenger vessels	53%	40%	49%	44%	34%	30%	32%										
Ports facing hinterland transport delays (last week compared to normal conditions, %)	Inland barges	27%	21%	19%	21%	16%	8%	19%										
	Trucks (cross-border)	43%	41%	35%	37%	38%	26%	28%	23%	28%	15%	9%	13%	0%	16%	15%	20%	19%
	Trucks (in/out port)	37%	33%	35%	35%	16%	15%	23%	8%	11%	15%	11%	12%	6%	14%	13%	13%	18%
	Rail services	28%	21%	35%	13%	22%	17%	19%	14%	13%	8%	9%	14%	5%	15%	11%	19%	25%
Ports facing high capacity utilization of warehousing and storage facilities (last week, %)	Inland barge services	41%	23%	35%	21%	19%	21%	20%	20%	18%	3%	9%	13%	4%	17%	3%	30%	27%
	Foodstuff & medical supplies	35%	34%	33%	25%	25%	20%	14%	16%	8%	15%	10%	20%	17%	20%	21%	16%	28%
	Consumer products	27%	28%	25%	18%	19%	9%	12%	13%	10%	12%	10%	17%	17%	20%	23%	15%	27%
	Liquid bulk	21%	22%	20%	15%	20%	17%	13%	17%	16%	16%	16%	18%	17%	14%	18%	15%	16%
Ports facing shortages in port-related workers (last week, %)	Dry bulk	16%	17%	13%	12%	17%	13%	10%	9%	18%	15%	10%	19%	16%	11%	18%	25%	33%
	Dock workers	16%	16%	16%	22%	19%	17%	16%	13%	13%	14%	5%	15%	7%	8%	8%	9%	27%
	Technical-nautical services	7%	9%	4%	12%	11%	6%	8%	7%	7%	7%	4%	12%	4%	4%	2%	3%	4%
	Harbor master services	4%	8%	7%	10%	4%	8%	10%	5%	4%	6%	2%	9%	4%	4%	0%	3%	2%
	Port authority	28%	22%	22%	26%	16%	22%	12%	12%	21%	8%	7%	15%	7%	4%	5%	7%	18%
Truck drivers	no data	no data	21%	16%	12%	9%	11%	10%	3%	7%	5%	13%	7%	10%	11%	6%	18%	

5. Impact of crisis on vessel calls

The first survey topic deals with the vessel activity in ports. The bar charts provide the distribution of answers per vessel category since the publication of the half-year Barometer report in September 2020. The line graph provides an overall picture of the percentage of ports that reported more than a 5% decrease in vessel calls per market each week since the first survey of the COVID-19 pandemic implications in early April 2020.

Analyzing in details the impact of COVID-19 per market (i.e. container, other cargo, passenger), five line graphs are also presented to demonstrate the evolution in vessel calls in the world as well as in three regions, i.e. Europe, North America, and Central and South America. Two graphs depict the situation for container vessels, with another similar pair of graphs focusing on other cargo vessels. The fifth graph zooms in on passenger vessels. We first discuss the results for the world, namely all ports who responded to the survey, followed by a regional analysis.



5.1. Container vessels

Blank sailings, mainly on trade routes with the Far East, heavily affected the weekly results for container vessels throughout the first half of the survey period. In the period between early April and mid-July 2020 between 40% and just over 50% of all respondents indicated that container vessel calls were down by more than 5%. However, the situation improved considerably by September 2020 (week 36) to reach a much lower 28%. In April 2021, some 29% of the ports report that the number of container vessel calls fell by more than 5% compared to a normal situation. This figure is much lower than the peak of 53% in week 21 and also below the 40-41% in the first weeks of the survey. In the last three months of 2020, this figure still stood at around 35%.

The share of ports facing a significant drop (over 25%) in container vessel calls reached 4.8% in April 2021, a figure that is about half of the results of weeks 17, 18, and 20. About two-thirds of ports report that vessel calls are similar or even higher compared to the same period the year before. The evolution continues to evolve positively

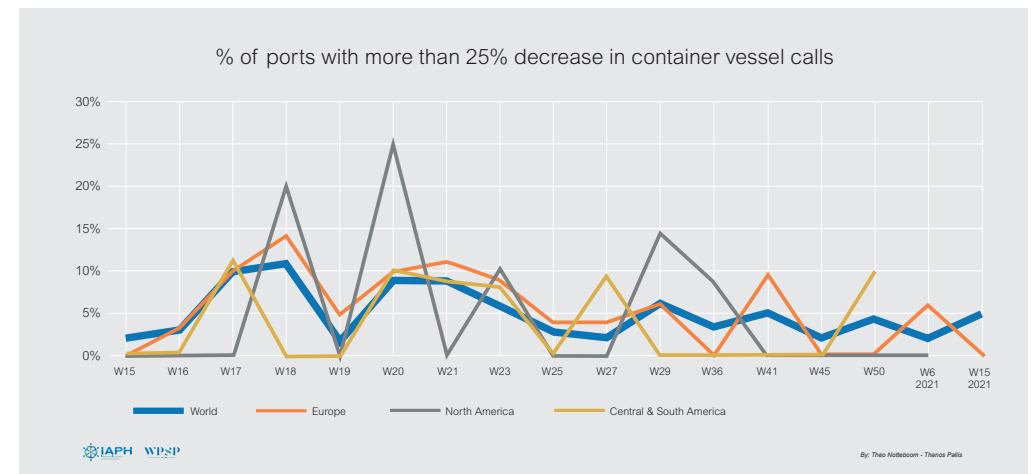
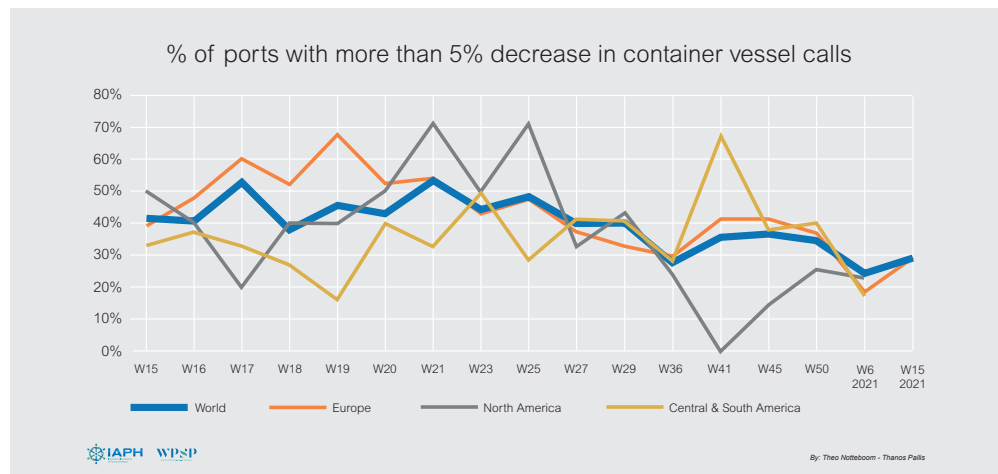
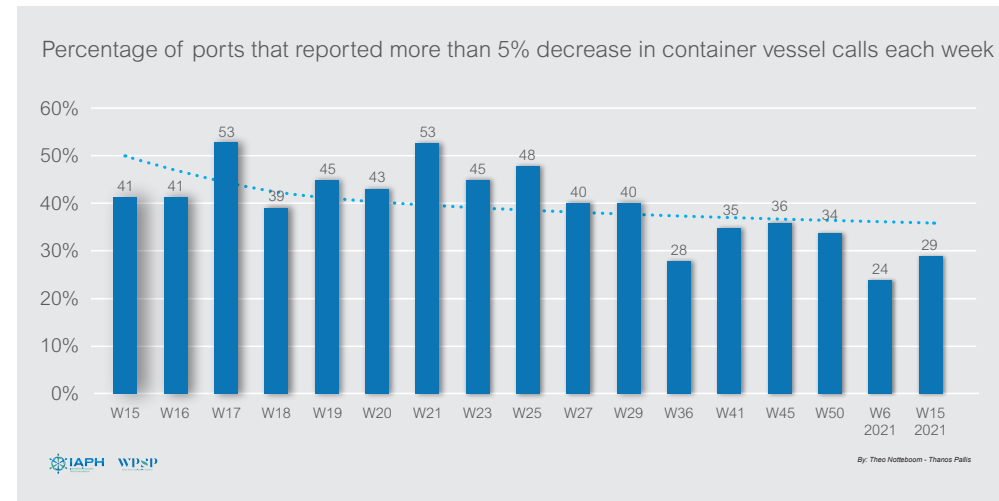
given the surge of container volumes on some trade routes (e.g., transpacific) combined with a sharp decrease in idle container vessel capacity since July/August 2020.

In the current conditions and given the sharp decline in the numbers of blank sailings, an increasing number of ports are heading to almost similar numbers of

calls compared to the same period the year before. At the same time, maritime trade volumes have also started to increase, as several economies, or major parts of them, have returned to operations with an increase in the number of transactions.

However, this is a return to a 'new normal' rather than the exact conditions of the pre-COVID-19 era. As recorded in the latest

survey of the year, ports provide services in different conditions – the permanent or temporary character of which is subject to confirmation: over the past several months, the container sector has seen occasional extra loaded vessel calls in addition to their weekly schedule of services. At the same time, on-time arrival performance for scheduled services has declined.

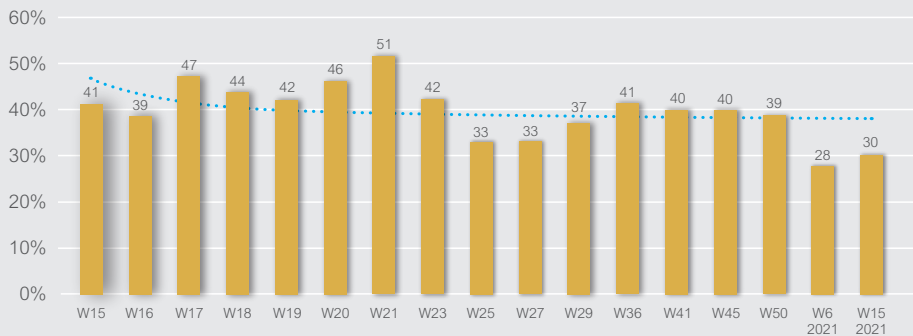


5.2. Other cargo vessels

The share of ports reporting reductions in other cargo vessel calls of more than 25% gradually decreased from 16% in week 21 to 4% in week 25, which is also far below the 12 to 15% observed throughout weeks 16 to 20. However, in weeks 27 and 29 the figure was up again to reach 9%. Since September 2020, the figure has been consistently around 4 to 6%. Globally, some 55% of the ports are now reporting

that the number of calls by other cargo vessels is relatively stable compared to a normal situation, one of the highest figures so far. About 15% of ports even point to an increase in other cargo vessel calls. Thus, the overall evolution since September 2020 has been a positive one, with only a small minority of all ports reporting reductions in other cargo vessel calls of more than 25%.

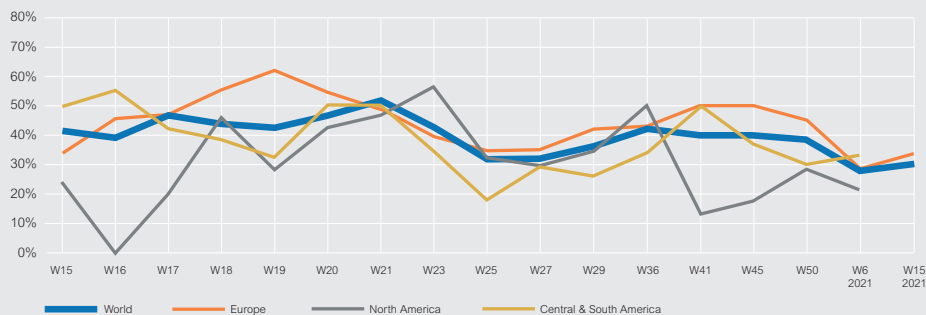
Percentage of ports that reported more than 5% decrease in other cargo vessel calls each week



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By Theo Notboom - Thanos Palla

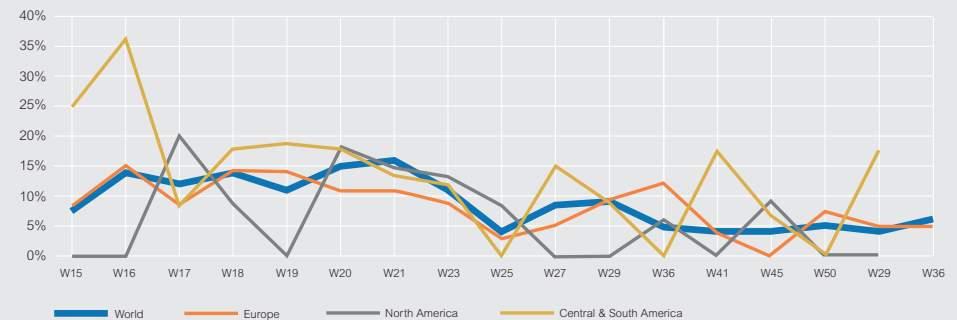
% of ports with more than 5% decrease in other cargo vessel calls



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% of ports with more than 25% decrease in other cargo vessel calls



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In the first half of the survey period, cargo vessel calls were impacted by the economic downturn and a series of measures. For example, at the start of the survey exercise, some countries in regions such as South East Asia imposed trade restrictions. This meant that despite the fact that ports were operating normally, only essential cargoes were permitted for delivery. Only certain window periods were allowed for delivery of non-essentials to and from the port. Container vessels calling at these ports carrying import cargo for local consumption faced delays, and most cargoes were still stored in port storage areas. In the same cases, tanker and ro-ro calls fell significantly due to restrictions on direct deliveries.

In the past months, in many ports other cargoes are on a par with, if not above, the expected levels for this period of the year. Cargo vessel traffic is now getting back to normal. There has been a recovery in goods related to several industries - such as exporting/importing for the steel industry or the movement of automotive units. Compared to the year before, the percentage of ports reporting a minor decrease in traffic has been low.

The cases of ports continuing to face the significant downward trend of their traffic continuing (i.e., at more than 25% compared to pre-COVID-19) are few. Yet, the normalization of the number of calls is not universal, as a total of 30% of the reporting ports continues to face a lower number of calls than a year before. For some of them, this stands as a surprise. Having expected an increase in cargo movement with the roll-out of the vaccinations, ports serving other cargoes than containers have seen a decline in cargo vessels (import/export) during the past two months.

5.3. Cruise/passenger vessels

The cruise/passenger markets remain the most impacted by the COVID-19 contagion. In week 15 of 2021, 32% of respondents indicate that passenger vessel calls are down more than 50%, in many cases even down more than 90%. This is a sharp decline compared to the 69% in November 2020. From week 20 to week 25, this figure was 61-62%, while in weeks 15 to 18, this figure amounted to two thirds of respondents with a peak of 76% in week 19. Since late August, only a few cruise operators have resumed some cruise activity, albeit on a very small scale compared to normal activity levels. For some ports, this implies that cruise ship calls will no longer remain at near-zero levels.

In the early weeks of the Barometer reporting, these figures were caused by a complete cessation of cruise activities. Cruise lines decided to cease operations, and cruise vessels ended up at berth for lay-up (no passengers, only crew), with some ports limiting the number of the crew remaining on board. In the early days

of the pandemic, measures applied to all cargo and passenger ships included vessels with suspected cases onboard remaining in quarantine for 14 days with testing afterwards. Other measures included foreign crew not being permitted ashore unless due to a medical emergency and requests for crew medical certificates with elementary health checks by VTS operators before permitting entry. Aside from the overall ban by authorities on foreigners in many ports, neither passengers nor crew of cruise vessels were or are still allowed to go on land.

Cruise and passenger vessels still remain to be seen in many places. The problem is more severe in cruise ports, as once port stated in the last survey, "this is a cruise port which has not had a vessel call since the onset of the pandemic in March 2020". On the one hand, in several countries, ports are still under an order from the government not to allow international cruise ships to berth at its terminals. On the other hand, as vaccination progresses and cruise lines return, one after another, to operations in some other countries, ports develop efforts and protocols to host against cruise calls. In recent months a few cruise operators have resumed some

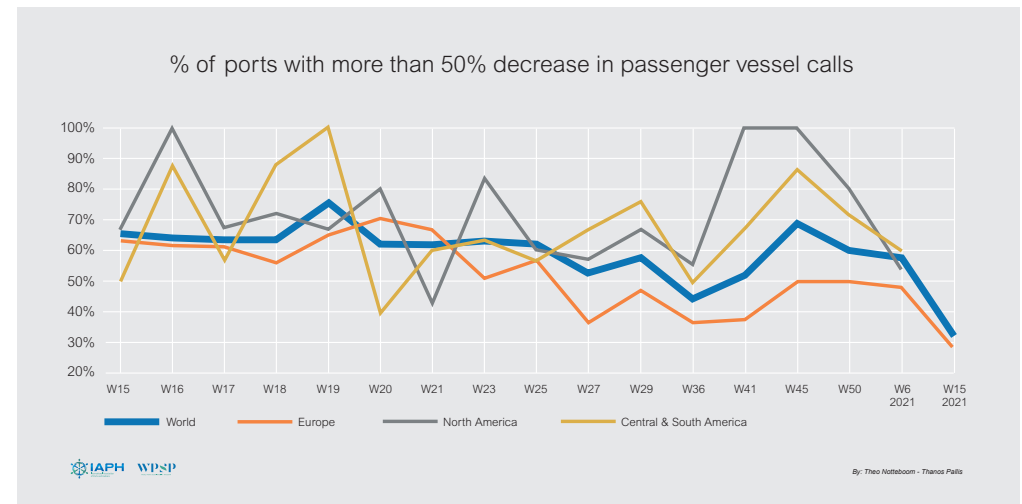
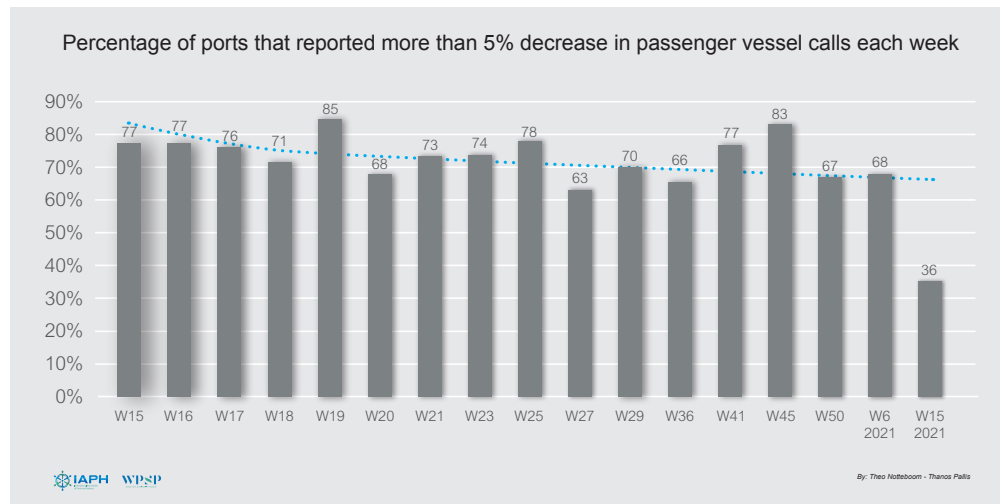
cruise activity. Even though the COVID-19 cases are on the rise in many countries, cruise lines' announcements to return to operations have become more frequent in previous weeks. That being said, the lifting of the voluntary suspension takes place on a very small scale compared to normal activity levels. For some ports, this implies that cruise ship calls will no longer remain at almost zero levels.

For the moment, cruise shipping does not seem to resume evenly in different countries and continents, even in those cases where it is expected to start. For a group of ports located in countries that advance the return of cruising, cruise vessels are berthing only for lay-up or shipyard. Another significant development is the decision of cruise lines to use only turnaround ports for departures and arrivals of the so-called 'cruises to nowhere' or 'blue cruises'. These are cruises in which guests embark on a vessel and remain onboard and at sea for the entire cruise without the vessel visiting intermediate ports of call.

A year after the pandemic outbreak, passenger vessels have yet to return to

normal in some parts of the world. RoPax vessels are still in layby due to COVID-19 related border restrictions. Others have no passenger activities beyond essential services as citizens remain restricted within municipality borders, and there is still no maritime traffic between regions of the country and/or to and from the islands. Passenger ships in operations continue with half the numbers of passengers on board, as the restrictions preventing these vessels from carrying more than 50 to 60% of their capacity continue to apply. There are still cases where due to the applied restrictions on people movements, the passenger vessels are used mainly for carrying cargo.

The most recent observations suggest an improvement and fewer passenger ports reporting a severe decline due to the return of coastal services to normal operations even with fewer passengers. It's noteworthy some ports provided data on vessel calls compared to the same period a year ago, and passenger vessels in 2020 were already inactive; thus, the picture of last observations might underestimate to a certain extent the reality of the impact of the pandemic.



5.4. Regional comparison

The five graphs on vessel calls presented earlier also contain relevant information on the situation in specific regions. Regional differences are becoming somewhat more pronounced as the world's ports respond to the Coronavirus crisis.

In the remainder of section 5, we elaborate further on the evolution in the number of vessels calls by comparing global results with regional ones. Three regions are considered: Europe, North America, and Central and South America. The regional findings for Africa, Asia, and Oceania are not reported separately, given the insufficient responses.

On a global level, about 29% of the ports currently are facing a drop of more than 5% in the number of container vessel calls compared to a normal situation. This figure has been fluctuating between 24% and 53% in the rest of the survey period. The regional results demonstrate that the crisis in Europe peaked in week 19 and has shown gradual improvement since then. In the Americas, the full impact of COVID-19 has been felt later than in Europe. The situation started to improve in week 27 after having reached peaks of 70% in weeks 21 and 25. No North American ports reported declines in container vessel calls in October 2020, while this figure rose to around 23% in early 2021. The trend in Central and South America shows signs that the situation has been improving since late June 2020.

In April 2021, a small minority of 5% of ports faced a decline in container vessel calls of more than 25% on a global scale. This share reached 10-11% in weeks 17 and 18. The European port system followed the global path till week 29, followed by a more volatile evolution afterwards. The results for the Americas in the +25% decrease category are highly volatile.

COVID-19 also affects port calls of other cargo vessels. The global results show that about 30% of the ports currently report a decrease of more than 5% in the number of other cargo vessel calls compared to a normal situation. Since the first week of the survey, this indicator has been moving up and down in a bandwidth of 28-51%. The European results show a peak in week 19 followed by fast improvement till week 25, followed by a second lower peak in October/November 2020. In the past few months, the situation has improved, with only 30% of ports reporting a decline in other cargo vessel calls.

The situation in North America was deteriorating in the Autumn of 2020 after a leveling off at around 30% in weeks 25 to 29. Also, here, we observe a clear improvement in 2021. Central and South America shows a highly volatile picture, with peaks in April, May, and October 2020.

The share of ports reporting reductions in other cargo vessel calls of more than 25% dropped from 16% in week 21 to 6% in April 2021, which is below the 12 to 15% range for weeks 16 to 20. The European results showing a 25% or higher decline in other cargo vessel calls were, for a long time, below the global survey outcomes, except for September and December of 2020.

The Americas show strong fluctuations, although the situation in the past half-year seems to be evolving in a favorable direction. Local slowdowns have not only impacted cargo vessels there. The logistics market has also been affected, with some companies reorganizing their supply chain and focusing on essential operations.

As mentioned earlier, the cruise/passenger market has been heavily impacted by the COVID-19 contagion. Except for weeks 20 and 21, the situation in European ports is a little bit better than the global picture. The results for the Americas show a high

level of volatility. In weeks 15 to 17, the curves for North America and Central and South America still followed a similar path. However, between week 18 and week 25 of 2020, the weekly survey results pointed to a high level of divergence between the two regions. Since then, the two regions seem to follow a similar path again.

Regarding passenger services, several European countries, such as Finland, Greece, Italy, and Spain, have lifted previous restrictions on passenger transport, excluding cruises. Cruise services remain suspended in other parts around the globe. In some cases, this is the outcome of policy decisions by the government impacting the entire year. In some other cases, an interim governmental decision has been taken (i.e. by one of the Ministries of Health). In

the light of recent EU-related advice for restarting cruise ship operations after easing COVID-19 restrictions, the European market remains more optimistic than the Caribbean one. In this largest cruise market of all, there has been no single cruise call for a year. Cruises expect to begin in July 2021 again, pending cruise lines, ships, and ports meeting certain requirements. In Canada, cruise ships have been banned and in many cases, all passenger services suspended by federal government decisions. Some ports have reopened cruise terminals, shops and restaurants under strict conditions such as liquid antiseptic use, large ventilation fans, and social distancing. In other countries, governmental imposed restrictions limit the potential of cruising as far as February 2022.



6. Extra restrictions on vessels

The COVID-19 resulted in some extra restrictions on vessels. The survey focused on this issue from week 15 to week 21. The overall results show that the share of ports imposing restrictions on container and other cargo vessels started to decrease in week 19. In week 21, about nine out of ten ports did not impose any restrictions on container vessels and other cargo vessels. The situation for passenger vessels also improved strongly by week 21: 80% of the responding ports did not impose additional restrictions (same as in week 20; 69% in week 19 and 44% in week 15). The share of ports imposing extra measures on all incoming passenger vessels reduced from 35% in week 15 to 9% in week 21, the lowest figure in the time series.

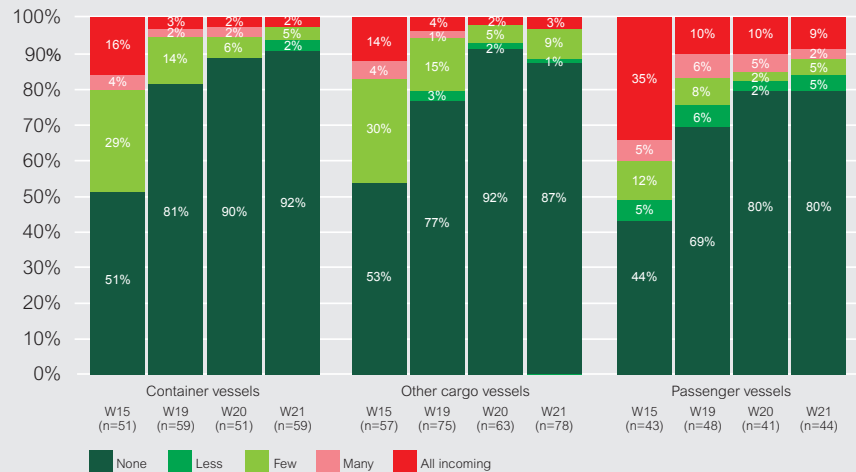
The applied restrictions have remained the same since mid-March. All vessel operations are performed in accordance

with local biosecurity procedures in order to avoid any impact on terminal performance. In some cases, vessels are inspected alongside. In other cases, vessels are all inspected before berthing when the medical team boards the vessel. The green light for the vessel to berth is given only after checking there are no suspected cases. There are no extra restrictions on vessels as long as health declarations remain clear. In many cases, only the truck drivers are allowed to board ferries. Health protocols are in most cases designated by the national health authorities.

Permissions for crew to disembark remained limited. In some countries, due to the preventive measures adopted by governments for port facilities, it is recommended that no member of the crew should leave their ship, unless it is deemed necessary for operational reasons and in accordance with security measures to prevent the spread of COVID-19. In other cases, the crew is restricted to 4-hour shore leave for essential purposes only.



Were there any extra restrictions on vessels introduced in the past week, for either cargoes or ship crews?



7. Extra delays due to changes in port call procedures

In the first Barometer report of early April 2020, nearly 7 out of 10 ports with inland barge operations reported no extra delays during the past week due to changes in call procedures (e.g. hygiene inspections, distancing of workforce, disruption of port or related services), while some 2 out of 10 ports reported minor delays (longer than 6 hours). For container vessels and other cargo vessels, more than 90% of the ports indicated zero or only minor delays. Also here, the worst situation was found in the passenger sector: 40% of the ports discontinued this type of operation, while nearly half of the ports reported no additional delays.

By week 21, the situation had changed. For inland barge operations, some 80% of ports indicated that activities were normal/back to normal and there were no extra delays during the past week due to changes in call procedures, down from a record 92% in week 20.

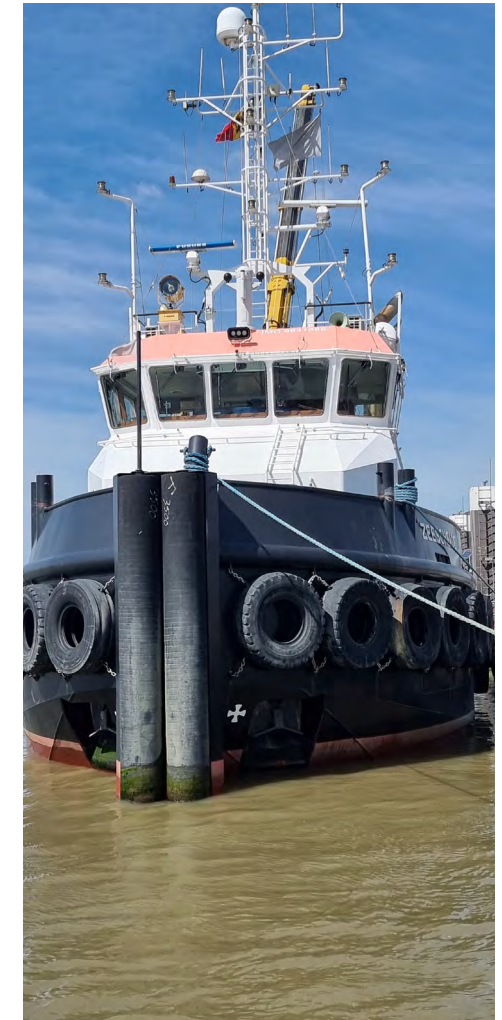
For container vessels and other cargo vessels, slightly less ports reported delays or major disruptions, which was mainly caused by a decline of the share of respondents facing minor delays. The passenger segment remained the most affected vessel category and the improvement observed in week 20 continued throughout week 21: while 24% of the port operations of this type had discontinued (down from 27% in week 19 and 33% in weeks 17 and 18), 68% of the

ports reported no additional delays (similar to weeks 19 and 20, but much higher than the 50-51% in weeks 17 and 18).

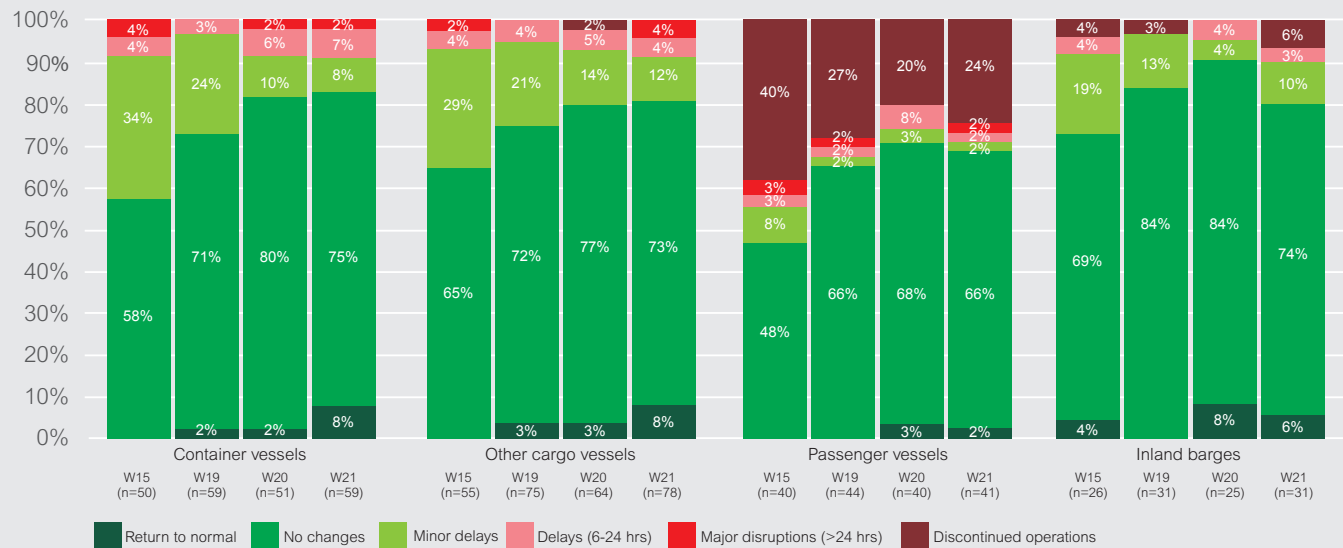
The reported delays were only those minor ones that take place due to the sanitary controls that were being carried out on ships, land transport and port workers in order to prevent the spread of COVID-19. Beyond these, there were no reasons for delays and regular conditions applied. Workers in many ports are at normal numbers and operations have therefore not suffered disruptions. The presence of fewer ships and fewer vessels than expected also naturally helps the case of avoiding delays.

However, in specific countries delays were caused by landside operations. For instance, the mandatory testing of truck

drivers in the short run resulted in a slowing of turnaround times. In some ports, all truck drivers were or are still required to have a COVID-19 free certificate, with testing taking relatively longer than expected. This is affecting truck turnaround time. Further reopening of the economies is expected to see these problems ease off. Nonetheless there are also concerns that it might result in the implementation of new procedures in the respective countries.

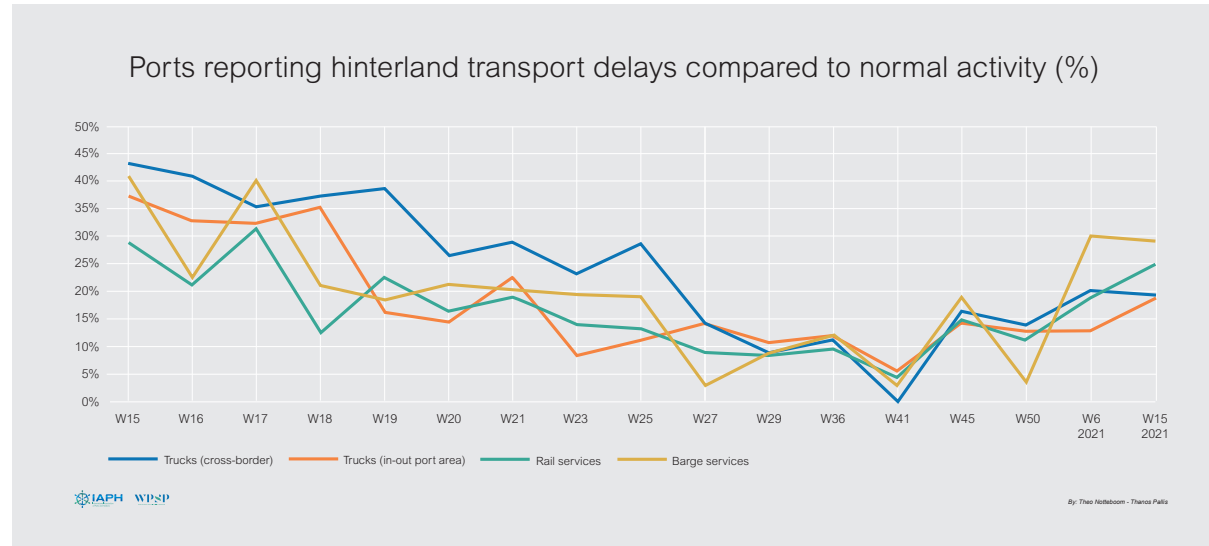


Were there any extra delays during the past week due to changes in port call procedures? (hygiene inspections, distancing of workforce, disruption of port or related services etc.)

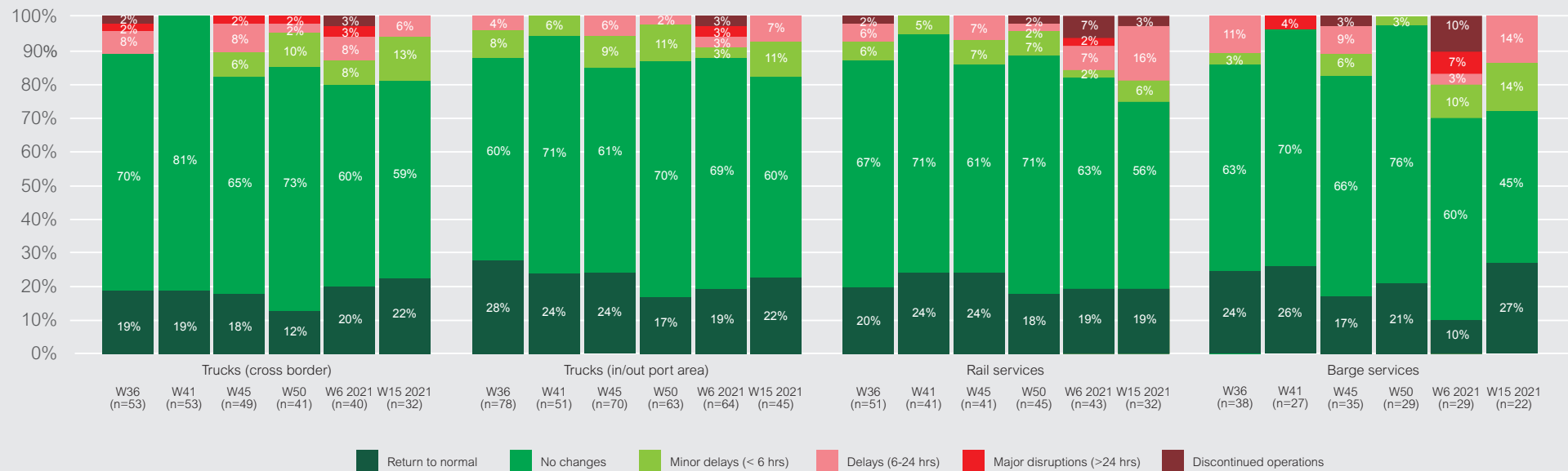


8. Impact of crisis on hinterland transport

Lockdowns, operational limitations, border checks, a lower availability of truck drivers and disruptions in terminal operations can negatively affect trucking operations in and out of the port area as well as to hinterland destinations. The bar charts provide the distribution of answers since the publication of the half-year Barometer report in September 2020. The line graph provides an overall picture of the percentage of ports that reported delays at 5% or more since the first survey.



How has hinterland transport been affected by the COVID-19 situation compared to normal activity during the past week?



8.1 Truck operations

Following the COVID-19 outbreak (i.e. week 15 and week 16) more than 40% of ports were in a precarious position, reporting delays (6-24 hours) or heavy delays (> 24 hours) in cross-border trucking activities compared to normal conditions. The restrictions preventing entry into neighboring countries, the need for truck drivers to quarantine for 14 days before continuing their trip, the suspension of operations by many truck companies, and the shortage of public health staff at borders were among the many issues that contributed to such delays.

Administrative problems due to the different approaches of neighboring countries were not insignificant; delays particularly occurred in the absence of cooperation between national administrations. Reports by several ports of this situation have come in from the Americas and Africa.

Fortunately, the situation has progressively improved, with the percentage of ports facing delays being lower than 30% since week 20. By October 2020 (week 41), none of the surveyed ports were experiencing challenges in cross-border trucking operations. The situation in hinterland transport slightly deteriorated afterwards. While in October, none of the ports were reporting delays (6-24 hours) or heavy delays (> 24 hours) in cross-border road transportation, this figure bounced up to 16.3% in November (week 45) and increased further to 19-20% in early 2021. While this percentage is far below the figures of more than 40% in weeks 15 and 16, it shows that fewer ports are experiencing normal cross-border trucking operations.

For trucks arriving or leaving the port, the percentage of ports that experienced problems in the first weeks of the pandemic reached 39%, rather evenly split between

minor delays (less than 6 hours) and more severe disruptions. In certain cases, trucks (in/out port) were also affected by governmental restrictions allowing delivery within districts. Due to lockdowns, or other restrictions in force, in several parts of the world only essential items were allowed to be moved to and from ports, while several took action to avoid congestion by scheduling non-essential cargo to move during specific time windows. The trend started to reverse in week 18 when ports reported that the situation was stabilizing with less major delays. Further improvement has led to 94% of ports reporting normal activity in October 2020. However, also here we observe a moderate reversal of the trend. By April 2021, the share of all ports reporting normal activity had reduced to 82%.

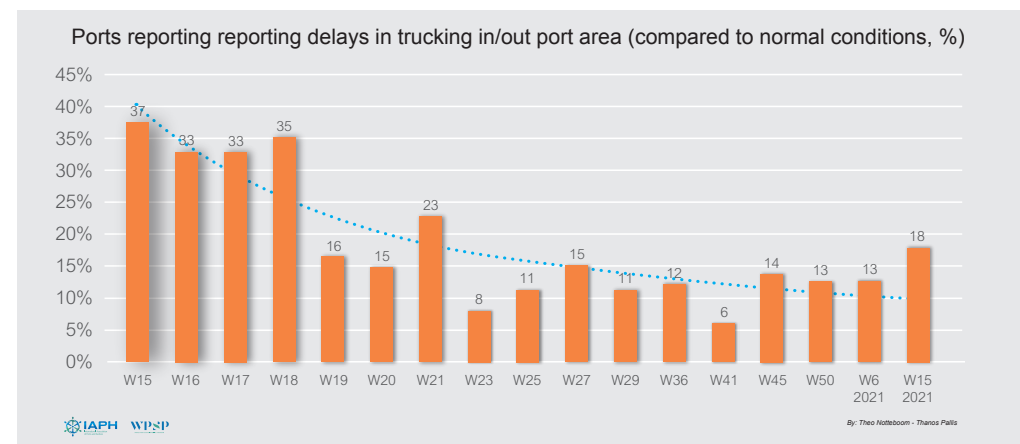
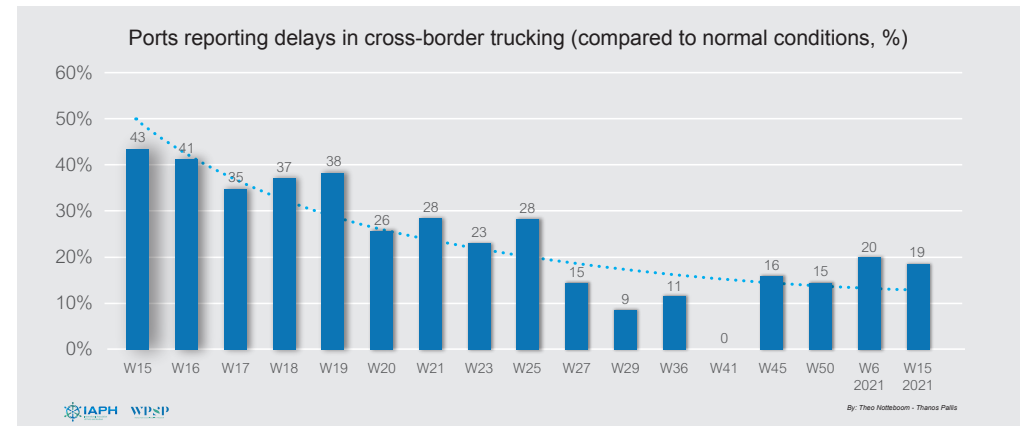
Overall, the impact on hinterland transport has been relatively low. In the three quarters of 2020, lower cargo volumes have impacted overall absence in delays. With lower maritime volumes arriving/leaving ports, road haulage has remained operational by and large in most regions of the world, securing the delivery of essential goods and more. During the reopening of the economies the reasons for delays in road transportation included the need to isolate increasing numbers of truck drivers who tested positive, and congestion problems due to essential road maintenance, which had been suspended due to COVID-19 restrictions.

With cargo back on the rise and passengers and tourists start moving via ports, keeping major lanes/roads closed to traffic started to create more delays for freight transportation to/from ports. These concerns intensified in the initial phase of the reopening due to instructions to avoid public transportation combined with the preference of the general public to use private means of transportation. Learning curves have been followed.

It is hard to evaluate to what extent the current delays can purely be attributed to COVID-19 restrictions. The reopening of markets and a wave of restocking/stockpiling resulted in a surge of containerized flows in recent months, with numerous ports in Europe and North America reporting record traffic volumes on the import side, while many key Asian ports are also seeing a strong recovery of the volumes compared to the first half of 2020. This sudden surge in volumes on several big trade routes is testing the capacity limits of ports/terminals and the inland transport systems, leading to disruptions in hinterland transport connectivity in some ports. A notable

concern expressed is that the increase of cargo traffic might impact logistics bottlenecks, leaving small (or no) space for any additional flow restrictions due to COVID-19.

Interestingly, some positive developments were also reported. In particular there has been better programming by the port operators to load and unload cargo from and onto trucks and rail cars while cargo reductions are experienced. In other cases, reports have been received of trucks rapidly adopting the terminals' adjusted booking systems for a quick, coordinated release of containers.

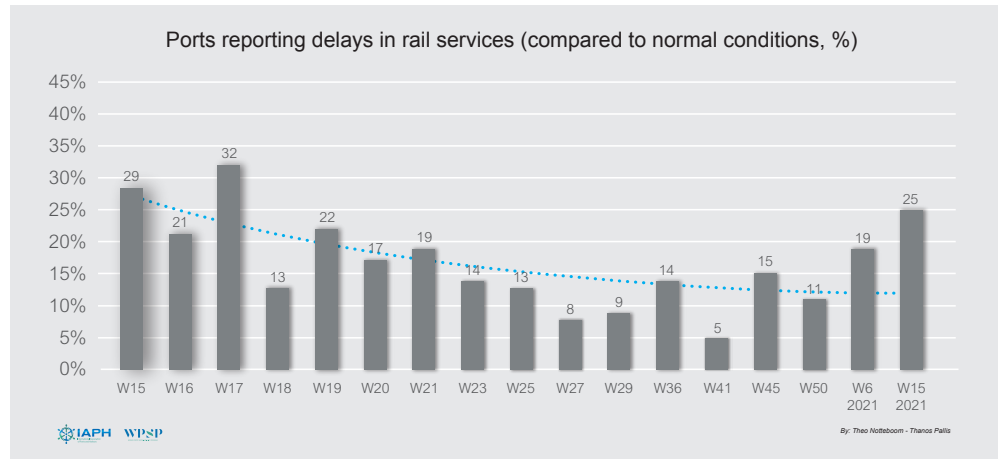


8.2 Rail transport

Almost 30% of ports reported that rail traffic had fallen in the early days of the pandemic – to some this was even due to the fact that motorways became totally free of traffic, while others reported that the potential generated from observing new protocols led, quite curiously, to a renewed interest in rail services. Soon, the situation improved quite substantially, and in week 27 only 8% of ports still faced disruptions in rail services. In October 2020, rail services to/from ports were back to normal, given that for the percentage of ports facing rail service delays compared to the same period

last year reached only 5%. Since then, however, this percentage has increased again reaching 25% in April 2021, mostly due to some difficulties reported in North America. The situation in other parts of the world has only slightly deteriorated.

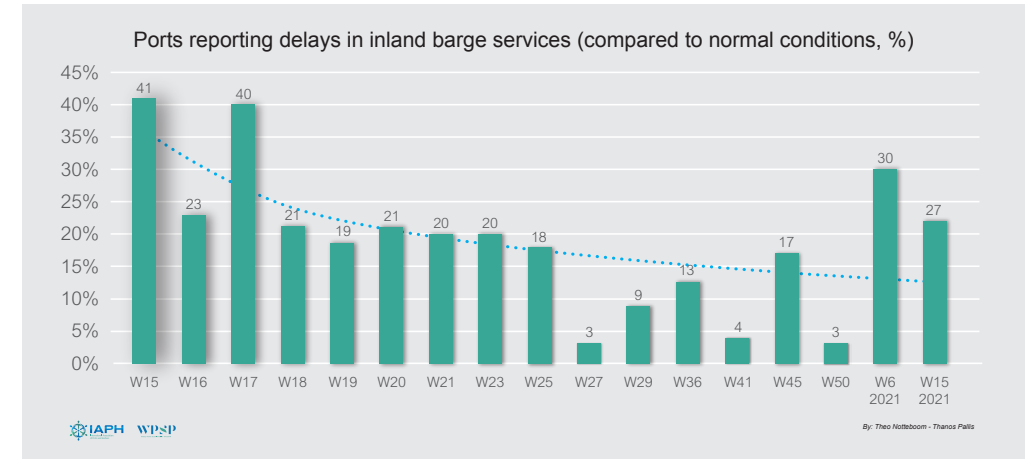
The survey also revealed that the increase of cargo volumes is not the only parameter generating concerns for ports. Extreme weather conditions (e.g. snow blizzards affecting rail tracks or excessive rain fall or drought affecting water levels on major rivers) and the Suez Canal Blockage of late March 2021 to some extent disrupted rail services and barge connections.



8.3 Barge transport

The situation for barge services evolved positively in 2020, following an initial shock in April 2020. According to the survey results this shock lasted until week 17. Barge services were affected with most ports reporting, in most cases, less than 6 hours delays. Thereafter, inland waterway transport picked up: in week 27 of 2020, virtually all ports were reporting normal operations, compared to 8 out of 10 throughout the weeks 19 to 26, and only 59% at the start of the survey. The

situation for barge services has significantly deteriorated, with 30% of ports now reporting delays. In late 2020, the share of ports reporting delays went sharply up from 3.7% in October to 17.1% in November, followed by a drop to 3.4% in week 50, which was the lowest figure since the start of the survey. The situation dramatically changed in early 2021 with more than a quarter of ports reporting delays. This suggests that (moderate) delays in barge services in specific regions (i.e. Europe) have returned.



8.4 Regional comparison

Three regions are considered in the regional comparison as regards the impact of the COVID-19 pandemic on port related hinterland transportation: Europe, North America and Central and South America. The regional findings for Africa, Asia and Oceania are not reported separately given the low number of responding ports. For Central and South America, we do not report all figures given the low number of respondents (< 5) for some of the weeks or on some of the sub-questions.

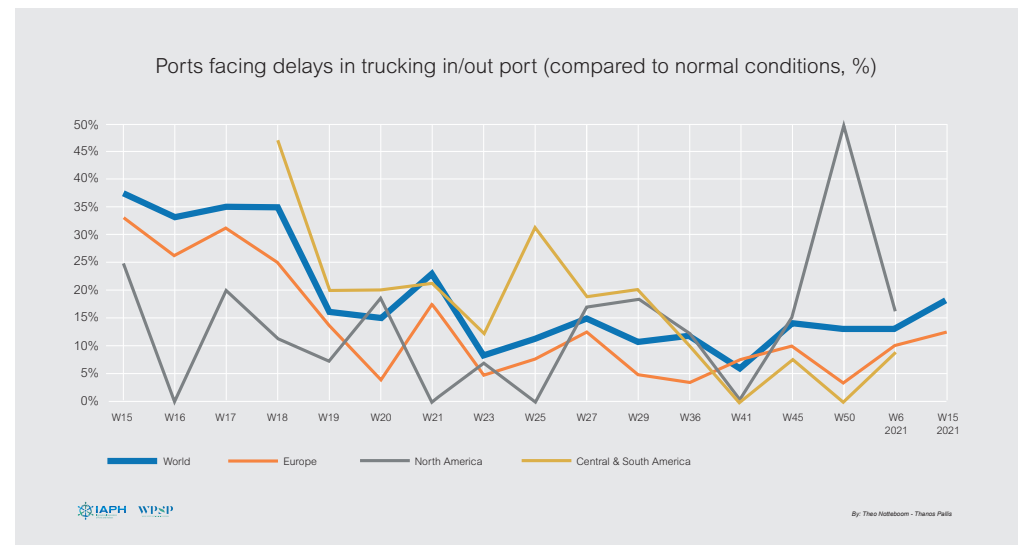
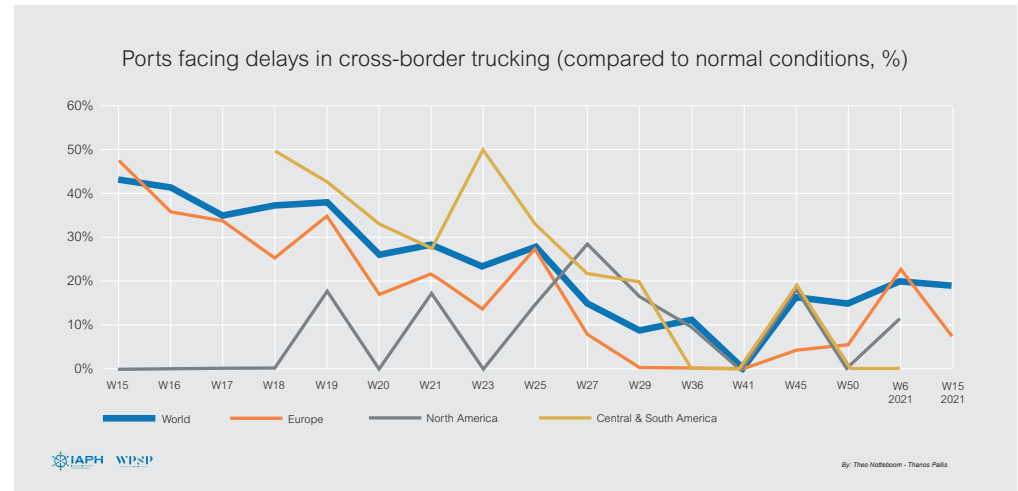
The situation with respect to cross-border trucking is heavily affected by the situation along the borders and related policies at national and or regional level. Among the regions considered, cross-border trucking in North America seems to have been affected the least by the Coronavirus, while the figures in Central and South America were the highest in the first half of 2020. European ports experienced a gradual improvement of the situation until October 2020, with a new peak in February 2021.

For trucks arriving or leaving the port, the situation continued to improve on a global scale until October 2020. While the situation has worsened in 2021, only 12% of European ports still report delays (all of them less than 6 hours) versus a hefty 33 to 25% in weeks 15 to 18. The situation used to be very precarious in Central and South America, where 47% of ports experienced delays comparing to normal in week 18 of 2020 followed by another peak of more than 30% in June 2020. Since then the situation improved considerably, with since October 2020 less than 10% reporting delays. North American ports were the ones that initially faced less challenges, with no delays reported in some weeks (i.e. weeks 25, 27 and 41 of 2020). However, major delays suddenly reappeared in weeks 27/29 and in late 2020. In December 2020, half of North

American ports were facing delays in the case of trucks arriving or leaving the port. In this region though it is worth considering the presence of other developments, such as the import cargo surge and availability challenges of dockworkers, which disrupted expected flows in several North American ports.

As reported earlier, only 5% of ports still faced disruptions in rail services in October 2020. The rail delay figures for Europe and North America have been fluctuating with a slow downward trend for Europe until late 2020 pointing towards an improvement of the situation. In early 2021, more European ports are reporting delays in rail transport, although figures remain far below the global picture. The situation is rather different in North America, where some issues regarding rail services were reported by one out of four ports in weeks 29 and 40 of 2020, with a steep peak of 40% in December 2020. The figures for Central and South America are not analyzed further given the low number of responses from that region on this specific transport mode.

European ports initially were the ones that have been confronted with challenges in terms of barge services. In the beginning of the crisis, problems occurred in more than half of the European ports that are served by barges. Since then the situation has been evolving positively: between June and December 2020 no European port has reported any such problems. Inland barge operators in Europe were considerably affected by lower cargo availability. The market situation did however worsen due to other reasons unrelated to the COVID-19 outbreak (i.e. low water levels on the Rhine and some other important river systems). Early 2021 brought a sudden sharp increase in the number of ports reporting delays in barge services. However, the current delays have little to do with the COVID-19 restrictions, as the surge in

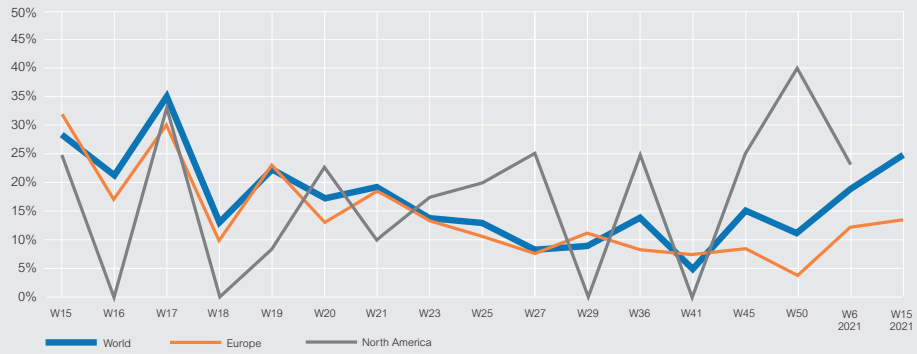


containerized import cargo is challenging barge operations in major European hubs with some container barges waiting for several days before being served at the deepsea terminals.

North American ports have been less affected. In fact such problems in North American ports have been sporadic, and observed in the range of 10% and 20% of

ports served by barges. Even though these are moderate delays (less than 6 hours), it is worth monitoring the trend and further exploring the underlying causes. As in the case of rail, the figures for Central and South America are not included in the graph given that less than five ports reported on the situation in the inland navigation sector.

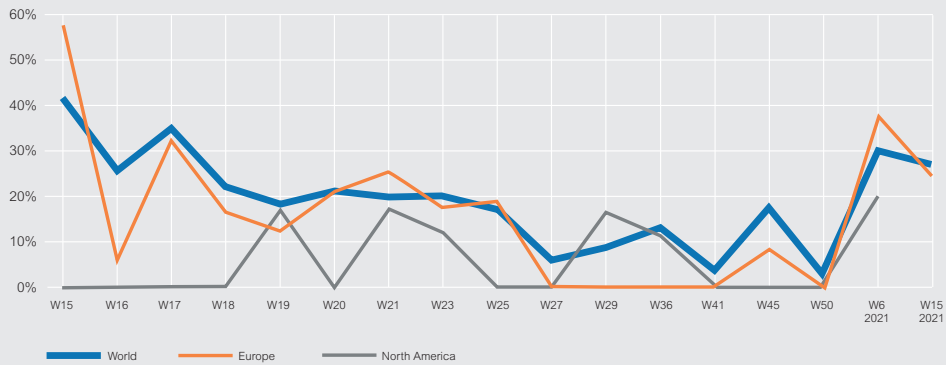
Ports facing delays in rail services (compared to normal conditions, %)



IAPH WPSP

By: Theo Nottboom - Thanos Pallas

Ports facing delays in inland barge services (compared to normal conditions, %)



IAPH WPSP

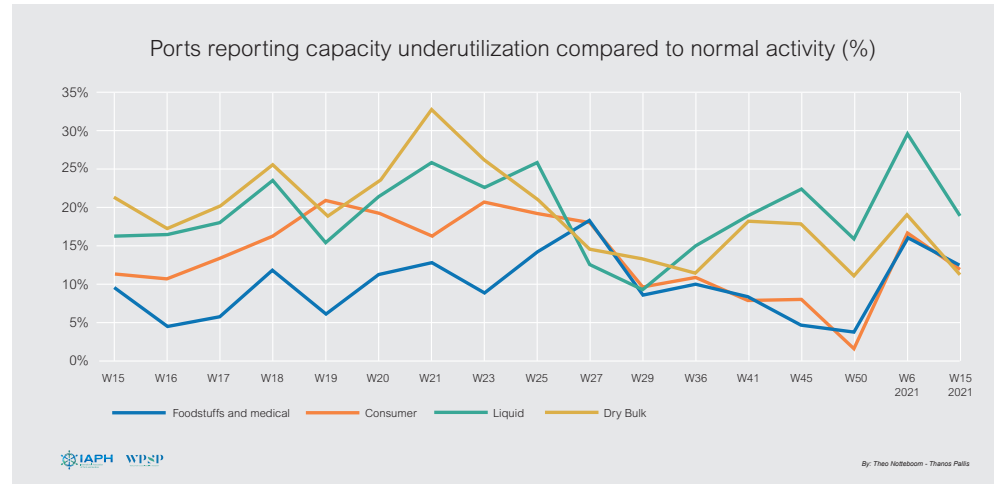
By: Theo Nottboom - Thanos Pallas



9. Impact on capacity utilization including warehousing and distribution activities

Warehousing and distribution activities in ports have in some cases seen changes due to changes in demand for consumer products or the closure of factories in countries with partial or full lockdown measures still in place. Utilization levels such as tank storage parks for liquid bulk, and oil products in particular, have to some degree been impacted by the sharp decline in the oil price at the start of the COVID-19 crisis.

The bar charts below provide the distribution of answers per goods category, i.e. foodstuffs and medical supplies, consumer goods, liquid bulk and dry bulk, while the line graph details the percentage of ports that reported capacity underutilization compared to normal activity each week.



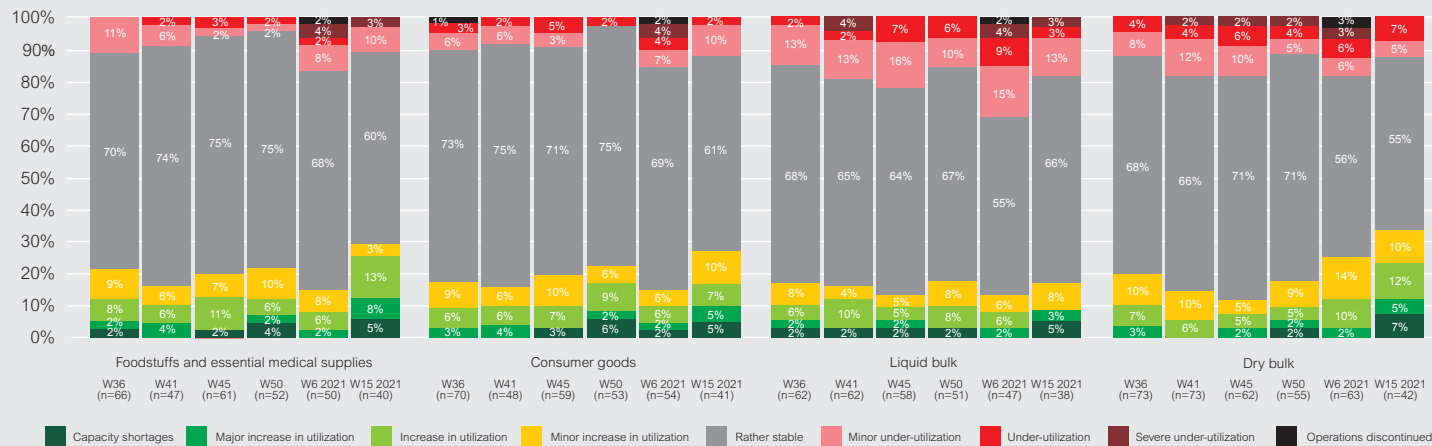
For almost 90% of the ports, cargo operations seem to come back to normal. One of the surveyed port reported that “six ships have already been refused in 2021 due to lack of space for storage in our multi-cargo terminal”. The impact remains higher in the case of liquid cargoes, though

this impact is far from uniform. For some, liquid bulk capacities are underutilized reportedly due to less aircraft traffic. For others, container import traffic continuing growth, vessels indicating minor waits for berth suggest strong utilization of dry bulk facilities. Undisputedly though, mandatory

lockdowns due to global pandemic have led to a reduction in fuel consumption, which affects the utilization capacity of ports. Other factors tend to have their ‘seasonal’ impact, i.e., the start of the Holy month of Ramadan increased consumer demand in certain parts of the world, increasing the import and subsequently increased capacity utilization in these ports. More detailed data remain in possession of private companies than ports, so the information provided by ports only attains a certain level of precision.

Furthermore, we present eight graphs that provide further insight on the utilization level of storage and distribution facilities for four groups of cargo. For each of these groups, we present a graph showing the share of ports (globally but also on a regional level) reporting underutilization of storage facilities and a second graph depicting the percentage of ports facing increased utilization or even capacity shortages. The discussion below primarily focuses on the results for all ports of the survey, as the separate results for Europe, North America and Central and South America are mostly showing strong fluctuations throughout the observed period. In one case, i.e. storage facilities in liquid bulk, we did not include the results for Central and South America given a very low number of responding ports.

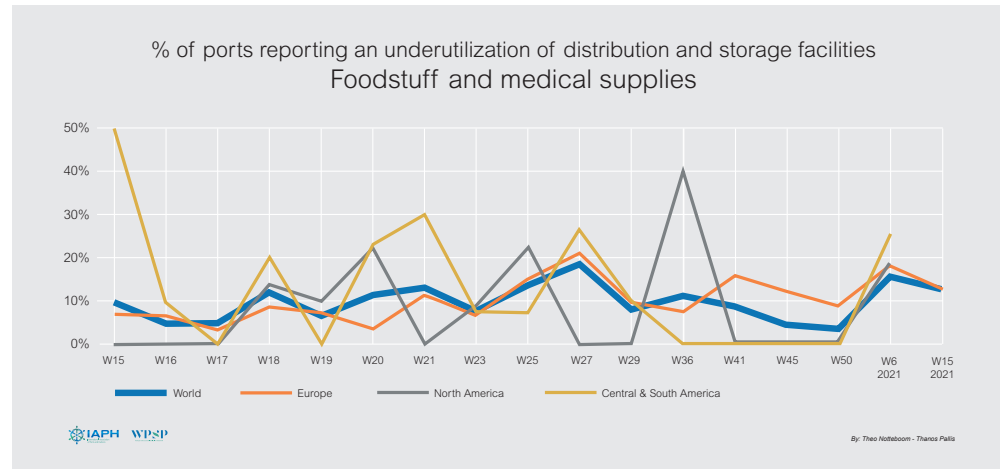
What is this week’s situation in terms of capacity utilization, including warehousing and distribution activities in your port?



9.1. Foodstuffs and medical supplies

The share of ports reporting an underutilization of warehousing and distribution facilities for foodstuffs and medical supplies fluctuated between 4 and 18% throughout the survey period, with peaks in weeks 27 of 2020 and February 2021. In recent months, this figure went up from 3.8% in week 50 of 2020 to 16% in week 6 of 2021.

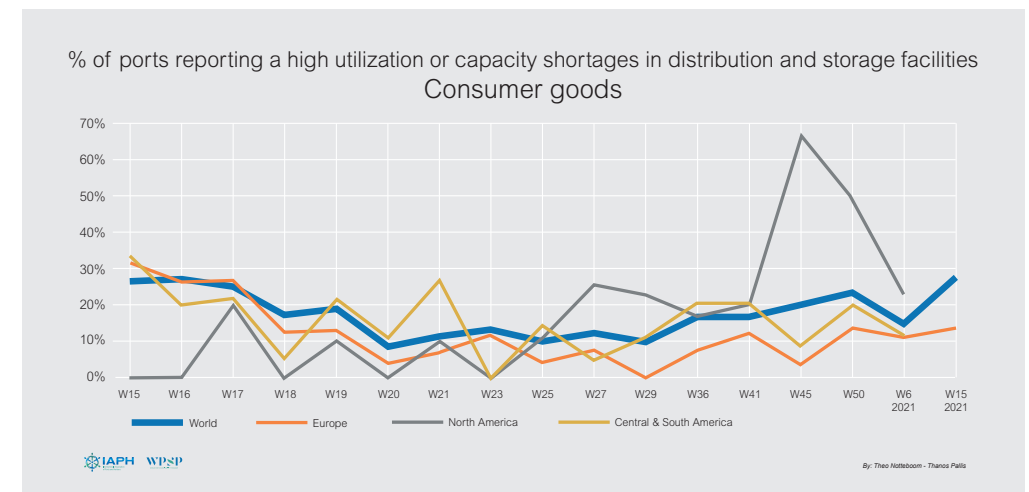
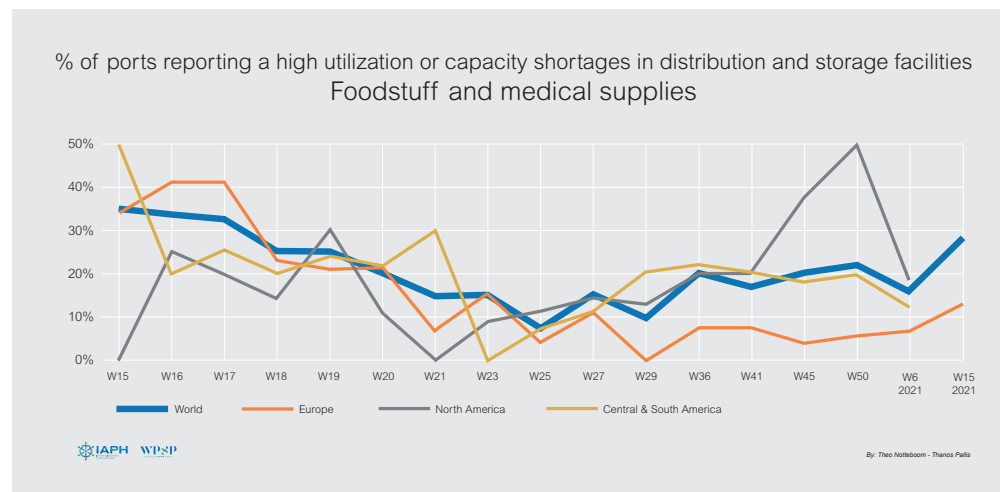
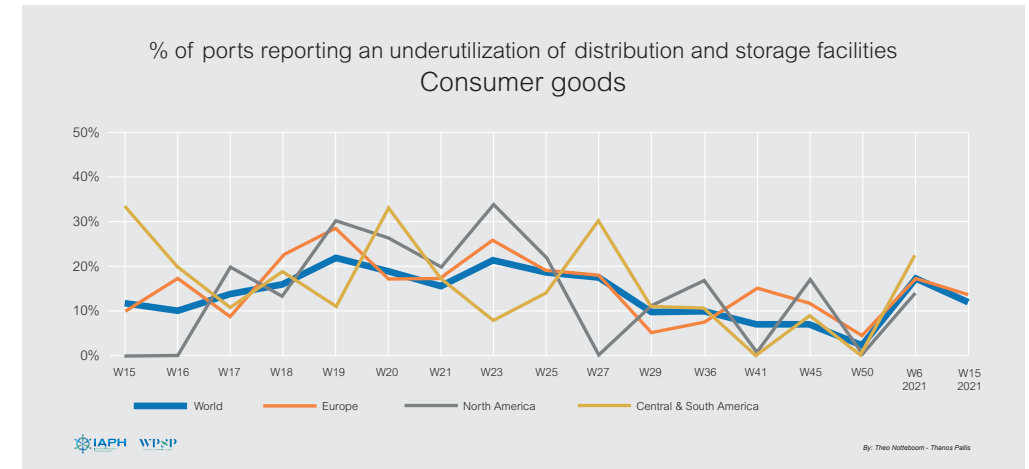
At the other side of the spectrum, we observe a gradual decrease between April 2020 and June 2020 in the share of ports reporting a high utilization or capacity shortages for foodstuffs and medical supplies. Since then, this trend reversed to evolve from 8% in June 2020 (week 25) to 28% in April of this year, the highest figure since April 2020.



9.2. Consumer goods

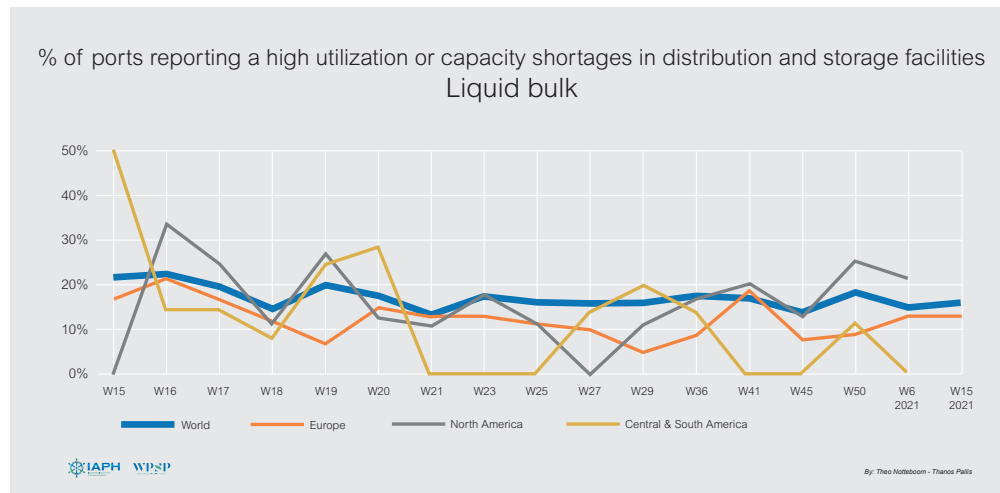
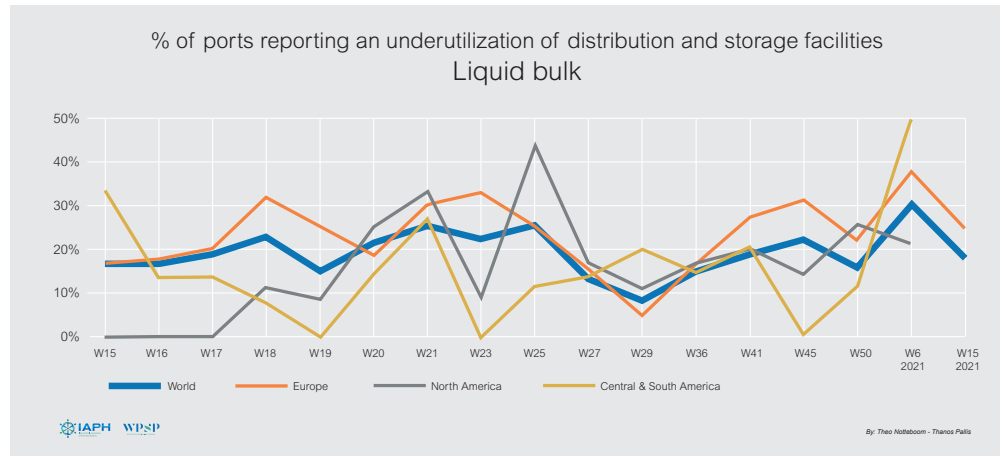
For consumer goods, 12% of ports faced underutilized facilities in April 2021 and 27% of ports report increases in utilization. In weeks 15 to 17 only 10 to 14% of respondents witnessed underutilization and 25 to 28% of ports mentioned an increased usage of facilities or even capacity shortages. From week 19 to week 27 (six

survey weeks in a row), more ports faced underutilization than higher utilization levels. The figures reached a balance in week 29 (10% each), but since then the balance tilted again towards increased usage of facilities. Since the Autumn of 2020, more ports are experiencing an increased pressure on warehousing facilities due to the growing demand for consumer products.



9.3. Liquid bulk

In the liquid bulk market, 18% of ports are reporting underutilization of liquid bulk storage facilities in April 2021. During the survey period, the share of ports with underutilized facilities fluctuated in a band width of 9% (week 29 of 2020) to 30% (February 2021), without showing a clear longer-term trend. The share of ports with increased utilization levels in liquid bulk storage facilities has remained fairly stable at 14-22% throughout the survey period.



9.4. Dry bulk

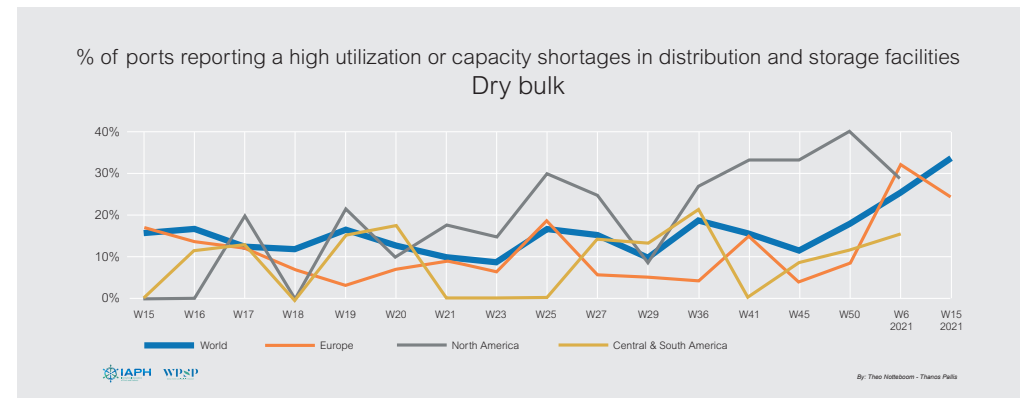
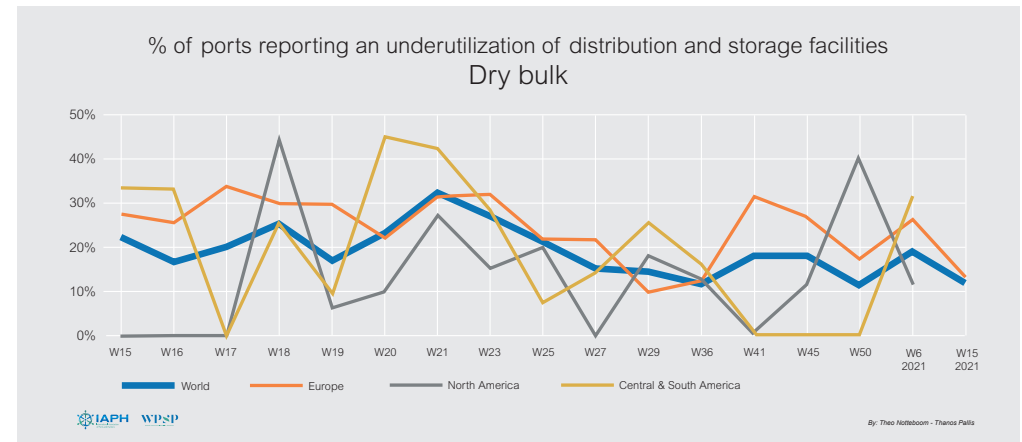
In the dry bulk sector, 12% of the ports reported an underutilization of facilities in April 2021, which is comparable to December 2020, but below the 18-19% of October and November 2020 and February 2021. This figure peaked at around 32% in May 2020.

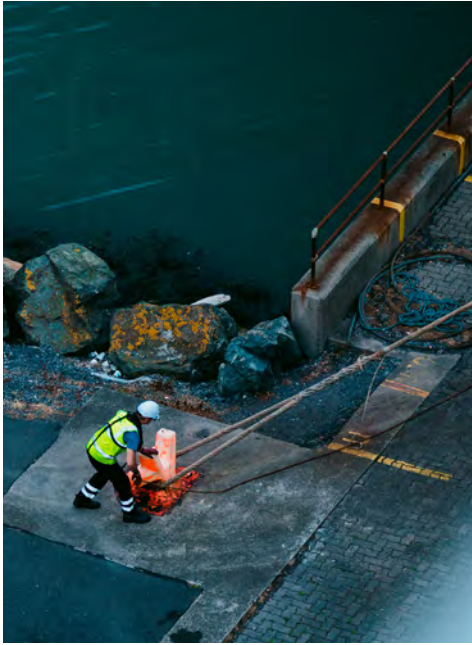
The share of ports with increased utilization levels in dry bulk storage increased sharply from 11% in November 2020 to 33% in

April 2021. Overall, the latter indicator has been going up and down in a narrow band of 10 to 20% until November 2020 with no clear observable trend. The evolution in the past month seems to point to a clear rising pressure on dry bulk storage facilities. It has to be noted that capacity utilization including warehousing and distribution activities are anything but uniform. For example, in April and May 2020 some ports reported an increase in port and terminal utilization due to an increase in the imports of essential goods, such as grains (rice, wheat). Stockpiling practices of importers also emerged and as a result a major increase in capacity utilization for these deliverables was not uncommon.

For exporting countries, the outlook for some bulk cargoes was or still is bleak, and for other bulk commodities such as ores, utilization was close to zero.

Liquid bulk provides a similar picture. For some ports these cargo volumes fell during the lockdown period due to less demand for petrol and diesel. For others, demand for liquid bulk, especially for imported fuels and power generation-related products, was very low due to a lack of industrial production and the mild climate. Nonetheless some ports reported or still report strategic storage of liquid bulks by traders in anticipation of future commodity price developments.

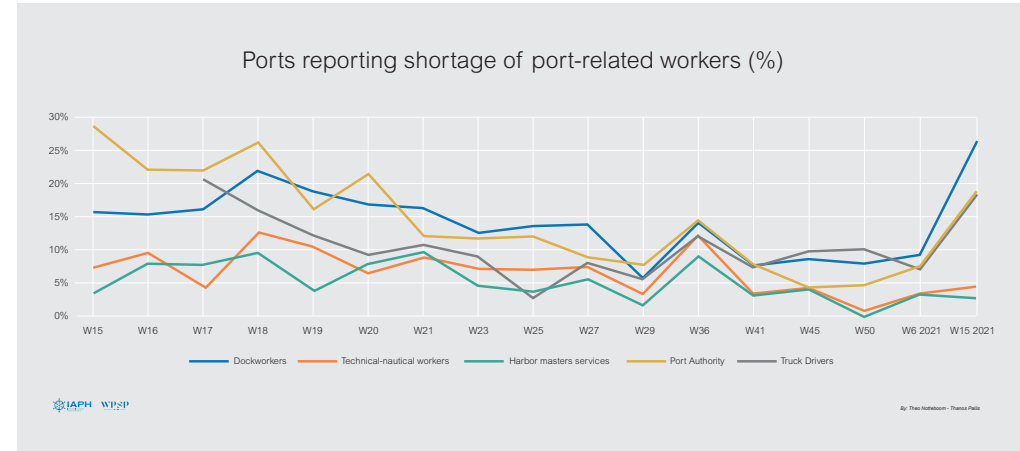




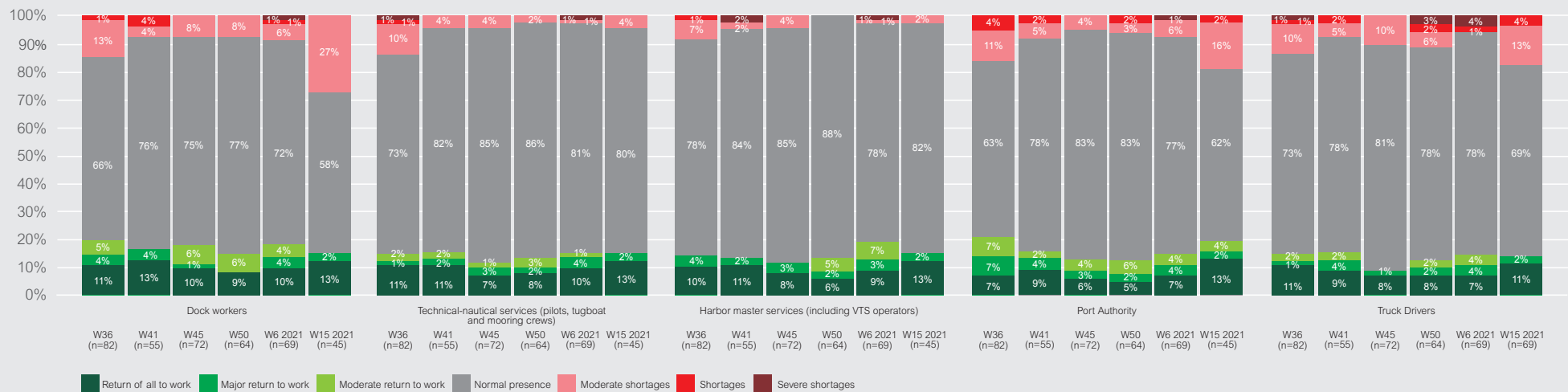
10. Impact on availability of port-related workers

The measures to fight the COVID-19 outbreak did affect the availability of port related workers. However, the level of impact limiting ports' capacity to operate was rather small. The shock of the first weeks resulted in some serious difficulties, with shortages of at all levels of personnel and workers reaching their peak in week 18. These initial shortages were due to dockers and administrative personnel remaining at home for the first weeks following the COVID-19 pandemic. At the same time, the impact of any workforce shortages was alleviated by a number of industries linked with ports remaining inoperative, with less goods transported to and/or from ports. Since then shortages have been decreasing, with the most improved situation occurring in early July

2020 and at the end of 2020. However, staff availability issues resurfaced in early 2021, although the share of ports reporting shortages remains below the peak figures of April 2020.



What was the availability of port workers last week?

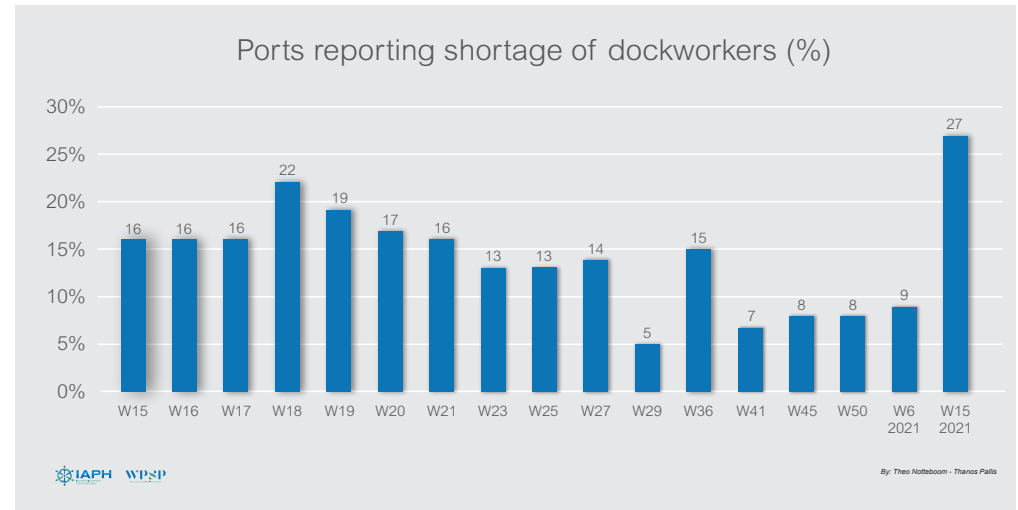


10.1. Dockworkers

Between May 2020 and mid-July 2020, the ports facing shortages of dockworkers declined from 22% to 5%. In October 2020 to February 2021, this figure remained very low at only 7-9%. However, April 2021 brought a sudden sharp rise with more than a quarter of ports now facing dock worker availability problems.

Dockworkers were soon to return to work, although a few of the ports reported that a number of the dockworkers stayed home longer due to lack of work, with the State paying part of their salary. Working on site normally took place with some extra safety arrangements in place and in some ports

only dockworkers under sixty years of age were allowed to return to work. Given the lack of cruise calls, some dockworkers serving these operations were among those that stayed at home receiving social security support. The recent surge in dock worker availability problems has several causes which differ greatly among ports: COVID-19 outbreaks among dock workers, port strikes and/or shortage of dock workers to handle the demand surge in containerized cargo.



10.2. Technical-nautical staff and harbor master services

COVID-19 crisis continues to have a moderate impact on the availability of port related workers for the delivery of technical-nautical services (pilots, towage, mooring). In April 2021, only 4% of the sample face shortages for the delivery of technical-nautical services. This figure peaked at 11-12% in late April/early May 2020 (weeks 18 and 19).

Problems with harbor master services (including VTS operators) have also been low throughout the pandemic – never exceeding 10%. In April 2021, only 2% of the sample ports faced a minor shortage of personnel for harbor master services, a percentage that has been below 5% since June 2020.

10.3. Port authority staff

In April/May 2020, major difficulties were observed in the case of port authority personnel. Between 20 and 30% of ports experienced such difficulties following the COVID-19 outbreak, when government-enforced rules and lockdowns imposed staff to work from home with only essential staff working from port. Adjusting to teleworking and social distancing took some weeks. The peak of the problem was week 15 when nearly 30% of ports were experiencing problems.

Teleworking expanded, transforming working from home as a regular practice, especially for employees in administrative services. Working in shifts became another adopted practice, in order to avoid a whole section/department being quarantined should one of the staff suffer infection. Operational workers attended work as normal in spite of port workers having to respect safety measures (i.e. longer checks; personal protection equipment etc.) in order to prevent direct contact (e.g. social distancing). As adaptation to the 'new normal' continued, shortages since then were limited to approximately 15% of

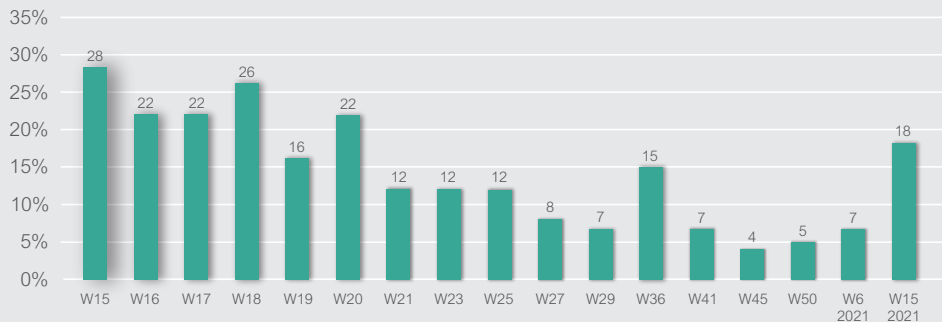
the ports or less. Since early June 2020, port authorities confronted with personnel shortages ranged between 4% and 15%.

However, April 2021 is an outlier with almost one out of five ports reporting availability issues, a sharp increase compared to previous months. In three continents, ports reported that COVID-19 cases were present and increasing. Hinterland municipalities returned with more severe restrictions measures (such as lockdowns) due to raising case numbers, deaths, and hospital occupancies. Emergency plans to delay the virus spread have been reactivated in those countries where the number of cases is rising. There is no current impact on operations and access to the ports, and conditions are expected to improve in the following weeks. However in some ports this has led to dockworker and port authority employee shortages without actually resulting in disrupted operations. As reported, ports are even planning help to municipalities to accelerate vaccination and analyzing the solutions together with private sector initiatives aiming to increase their resilience to any further 'wave' of COVID-19 cases.

10.4. Truck drivers

Since week 17, the Barometer has monitored the availability of truck drivers. Following an initial period of considerable shortages, i.e. at 21% in lockdown conditions in many economies (week 17), the situation improved. By mid-June 2020, only 3% of ports faced shortages of truck drivers. Since then, the availability of truck drivers remained high with less than 10% of the surveyed ports facing some moderate shortages. However, also here, April 2021 is an outlier with almost one out of five ports reporting availability issues.

Ports reporting shortage of Port Authority personnel (%)



10.5 Regional comparison

The following three graphs provide regional insights on the availability of three groups of port related workforce: dock workers, port authority personnel, and truck drivers.

North American ports are the ones that have faced comparatively fewer shortages in dockworkers and truck drivers. That the U.S. opted not to apply generalized lockdowns had an impact on these results. Following an initial shock (i.e. 25% of North American ports faced some shortages in week 15), the situation improved rapidly and shortages remained below 15% since week 20 of 2020, in many cases even standing at zero shortages. It remains to be seen, however, whether the sudden peaks in weeks 36 and week 50 of 2020 are due to the COVID-19 pandemic or due to other developments (such as localised outbreaks or strike action by port workers in the region or otherwise). The same applies to truck drivers as well, where peaks of up to 15% have been recorded in weeks 36 and 50 of 2020, after many months of no reported availability issues.

The survey results also reveal that North American ports only faced shortages of port authority personnel in the first half of the observation period. During the early days of the pandemic (week 17), 40% of the ports in North America faced the challenge of operating with a shortage of personnel. Staff at most ports are now back to work at the office on a full-time basis, following the necessary protocols (e.g. frequent hand washing, physical distancing, wearing of masks, avoidance of touching face areas, disinfecting surfaces frequently, installation of Plexiglas barriers, etc.).

In Europe, the percentage of ports that experienced some shortage of dockworkers during the first weeks of the pandemic (week 15 to week 25 of 2020) was higher

than the world average. The peak was observed during weeks 18 and 19 when in approximately 30% of European ports the number of dockworkers was lower than required. The situation improved, reaching the lowest point in July 2020 and again in February 2021. As the European economies continued to ease restrictions, very few experienced shortage of dockworkers. However, the situation in April 2021 is very different with about a third of ports reporting problems, mainly caused by the demand peak now having its full impact on terminal capacity challenges in ports. In terms of truck driver availability: the shortages of the early days (i.e. week 17 (22%), week 19 (14%)) eased to small single digit percentages by the Summer of 2020. However, some shortages of truck drivers are back since September 2020 with peaks of 20% in November 2020 and April 2021.

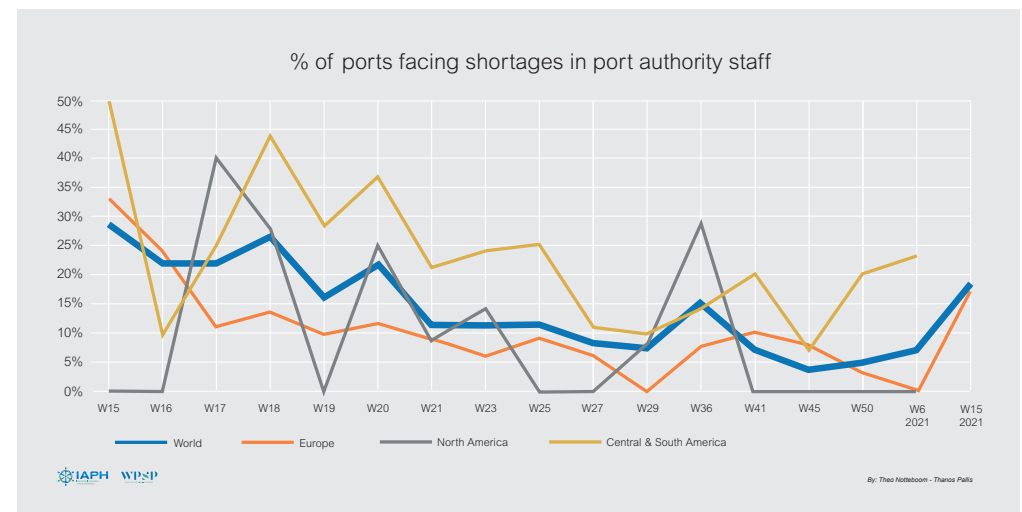
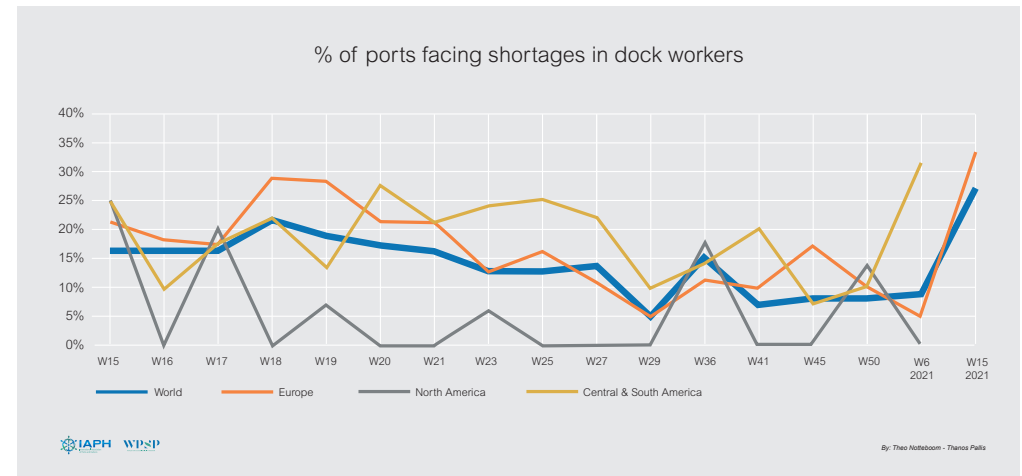
A similar pattern has been also observed in the case of European port authority staff. An improvement in processes led to the percentage of ports having fewer people available than needed to lower from 33% in April 2020 to zero in July 2020. Single digit percentages were reported since then, before an upsurge occurred to 18% in April 2021. In some cases this shortage is only 'nominal' as a number of personnel are combining the home-office model of work with partial attendance at port offices.

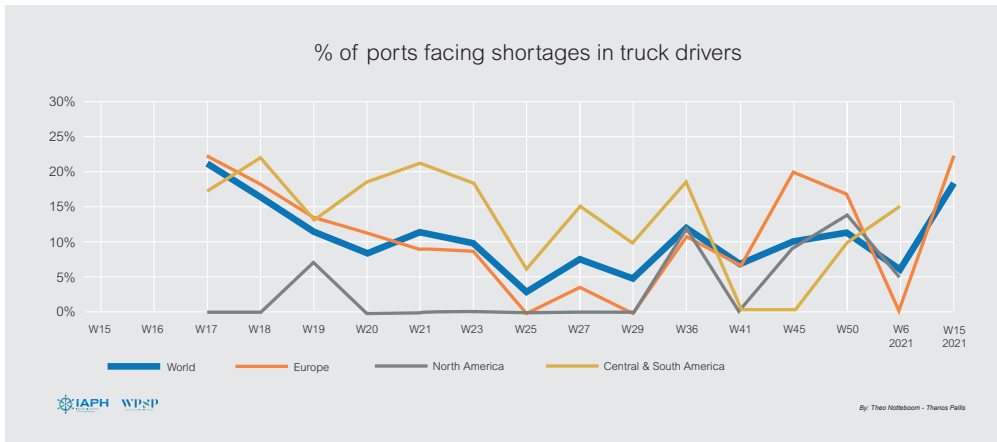
Central and South American ports are the ones that have faced the greatest problem in terms of availability of port related workers. From week 20 to week 27 of 2020 the percentage of ports in the region facing shortage of dockworkers ranged between 20% and 25% before the situation improved somewhat, although peaks of more than 20% occurred. A similar picture is observed in the case of truck drivers. Since the COVID-19 outbreak just short of 20% of ports in Central and Latin America were confronted by a shortage of truck drivers.

Since week 25 the situation improved a little. However, the results of the past months point towards an increased number of ports in the region (> 20% of the total) experiencing a shortage of truck drivers.

Ports in Central and South America appear to have experienced extensive issues with respect to the presence of port authority staff, at least during the initial period of the crisis. In week 17 a shortage of port

authorities personnel was observed in over 40% of ports in the region. This percentage decreased progressively to approximately 25% during weeks 21 to 25, and to less than 20% during weeks 27 and week 50 of 2020. In February 2021, about 23% of the ports in the region facing some (moderate) port authority personnel shortages. Similarly to other regions, working personnel are respecting applicable new protocols and controls.





11. Investments

11.1. Impact on planned port infrastructure projects

A major crisis, economic or else, might have long-term effects on both the development and operations of world seaports. Plans and investments in upgrading existing infrastructures, or constructing new ones, might be revisited, advanced earlier or later than had been initially scheduled, even canceled and/or replaced by new ones that emerge as essential with the new situation. These effects are not present during the outbreak of the crisis, when the necessity for ports to remain operational and serve essential trade prevails. However, they might emerge later in time, when the magnitude of the crisis is further realized.

Half-year after the day that the World Health Organization declared COVID-19 a pandemic, in early September 2020 (week 36), 69% of the surveyed ports reported that the majority of their investment plans were delayed in some way or even amended. 41% of the reporting ports informed that the delays in investment were, at least for the moment, minor. Due to the changing conditions, major investment delays were occurring in 19% of the ports. A few ports (4%) decided to shelve or cancel existing investment plans, while 3% of respondents already decided to replace specific investments by other ones. Few of the surveyed ports reported that given the emerging conditions they decided to accelerate their existing investment plans and execute them faster than initially scheduled.

Six months later, in April 2021, the picture as regards the implementation of the investment plans in world ports looks even more positive. About 41% of the ports have managed to achieve progress in line with the planned timeline, overcoming the initial

shock produced by the pandemic, and the percentage of ports executing these plans faster than the respective initial plans has reached 5%. Adding that for 30% more any delays are minor, it is evident that port investments at seven out of 10 reporting ports, were neither forced to abandon nor decided to delay investments significantly due to the circumstances.

For the moment, any delays in investments in three out of four ports are minimal, and in any case have not negatively impacted cargo and vessel traffic movements. In some cases delays happened due to difficulties in obtaining authorization by regional, federal, and/or national administrations, as priorities of these administrations were shifted to combating the pandemic. In other cases they were delays by third-party contractors, most likely attributable in part to the availability of workers affected by the COVID-19 situation. Some of the existing delays refer mostly to smaller projects (i.e., repairs to cribs on terminals, painting of marine petroleum products pipelines, etc.), as major investments (e.g., a new container terminal) have only incurred minor delays, and most of them are progressing as planned. While the COVID-19 situation has added to the challenges already inherent in planned infrastructure projects, the pandemic has not necessarily yet had a major direct impact on the timing of these investments. A reported implication of COVID-19, though, has been the increase of the difficulties for a port in accessing funds from foreign partners.

In one out of four ports, though, investment projects have experienced major delays, with a tiny percentage (2-4%) having decided to shelve planned investments altogether. In some of these ports, the observed delays seem to be part of longer-term adjustments. Few ports have postponed their projects to be further

assessed once market conditions will allow for a clearer view of the total impact of COVID-19 on social aspects and market demand. Projects already commenced during the pre-COVID-19 period continue as planned, but new investments are on hold; few ports only reported that they have already decided to postpone scheduled investments for one year. Plans for investments in infrastructure for the cruise industry are questioned more than

others, with several ports being unsure as to when these should come to fruition. In some ports, these discussions are ongoing, other ports stated that investments in new cruise terminals have been shelved for the time being, with port authorities waiting to know more about the cruise development prospects first before reassessing their potential. All these factors make a case for further monitoring the evolution of the investment plans of ports.

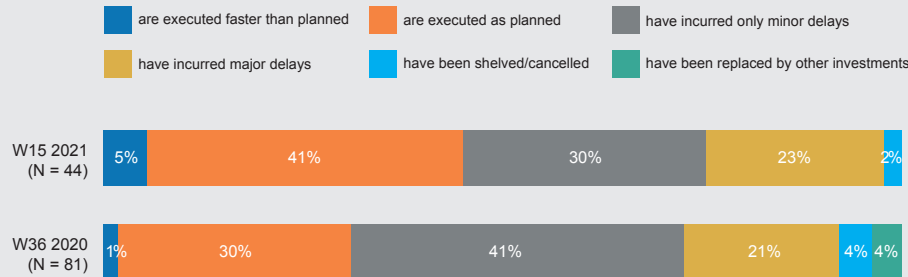
11.2. Investments in environmental sustainability

The Barometer survey of week 41 of 2020 focused on the trends observed in planned investments in environmental sustainability and the extent that these investments have been revisited, advanced earlier or later than had been initially scheduled, even canceled and/or replaced by new ones that emerge as essential with the newly-developed conditions.

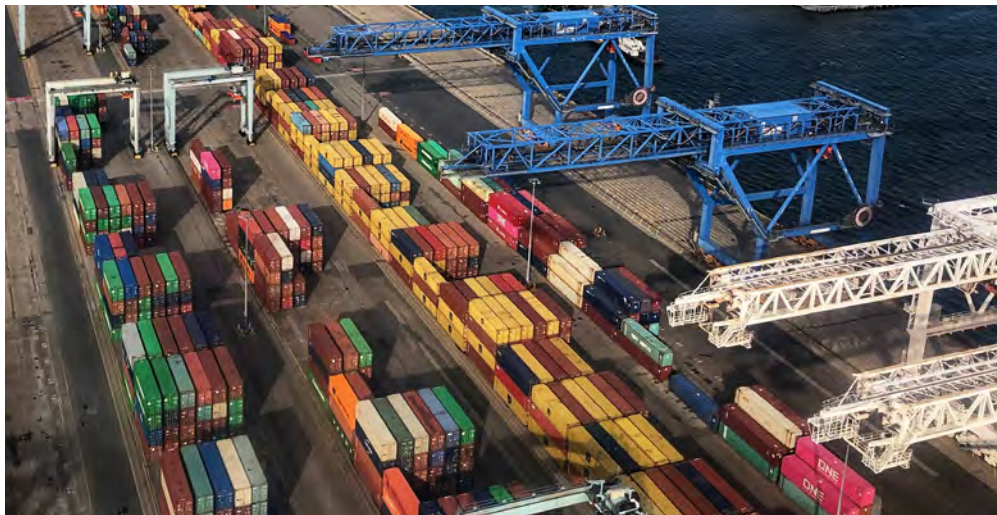
investment has occurred but, at least for the moment, they are only minor. Even though conditions are challenging, and as a result the percentage of the ports reporting that investments have incurred major delays is not insignificant (15%), only a few ports (2%) have decided to shelve or cancel existing investment plans. Rather than this, some ports (4%) have already decided to accelerate and execute such investments faster than initially scheduled while some others (2%) that have decided to proceed with additional investments. Evidently, the industry is standing devoted to advancing its sustainability even in conditions of crisis.

The survey revealed a positive picture as regards the commitment of ports to advance the plans that they had made before March 2020: 45% of the surveyed ports reported that there had been no delays and planned investments in environmental sustainability projects are executed as had been foreseen. A further 32% reported that as a result of the COVID-19 pandemic, delays in such

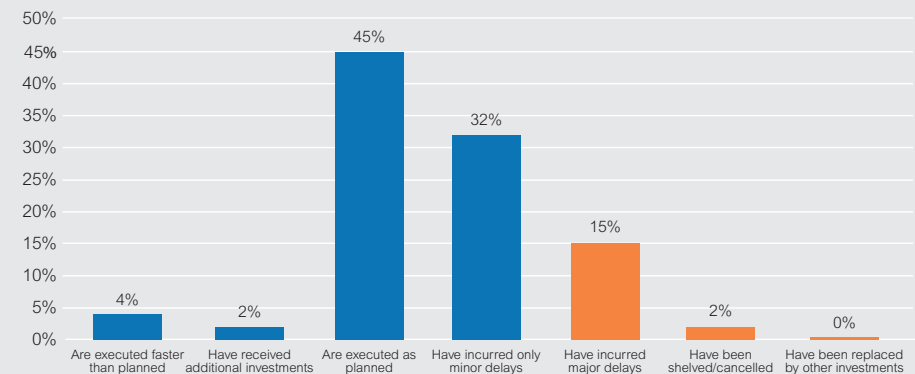
The majority of planned port investments



By: Theo Notteboom - Thanos Pallis



Trends in planned investments in environmental sustainability (n=53)



By: Theo Notteboom - Thanos Pallis

12. Crew changes

For three weeks, i.e. weeks 27 and 29 of 2020 and week 6 of 2021, the Barometer included asking a question on crew changes to the responding ports.

The figure below shows the results for the world and specific regions. On a global scale, 44% of ports that provided information on crew changes reported no crew changes had taken place in week 6 of 2021, down from 55% in week 27. In a quarter of ports, a very limited number of crew changes have occurred (less than 5) compared to one third in week 27.

When comparing regions, European ports continue to show the best picture in terms of the crew change situation. In North America, crew changes remain at a low level, with 50% of ports indicating there have not been any crew changes in week 6 of 2021. This figure is comparable to the 57% in week 27.

Overall, the crew change situation remains more precarious in the Americas compared to Europe.

Crew changes have happened in several of the reporting ports. In some countries, the type of vessel flag continues to be crucial with respect the procedures for the crew change. Nonetheless, as reported, whenever crew changes take place, they are successful in all respects. Domestically-registered vessels continue to perform crew changes, but foreign crew changes have occurred with no concern or delay.

Several responding ports replied that crew changes are possible, but there have not been any vessel calls for crew changes. The feedback to the survey also reemphasized that ports have no say in neither decisions related to crew changes nor in terms of overlooking the implementation process, as these changes depend on other authorities and procedures beyond the port.

13. Share of empty containers in total container throughput

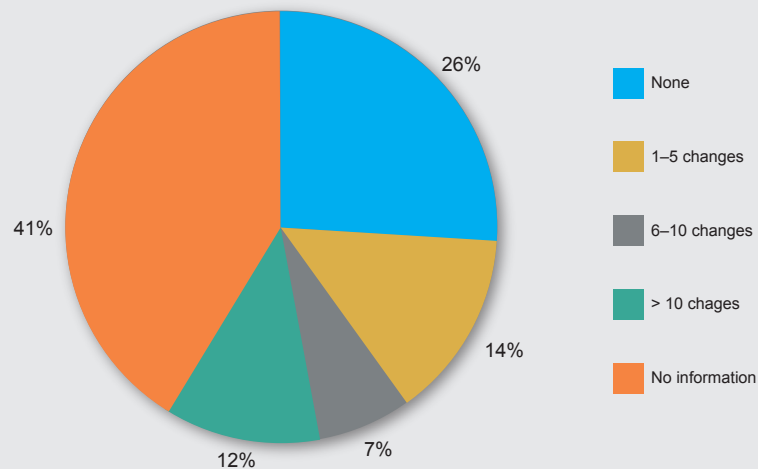
The Barometer survey of December 2020 included an additional question, asking ports to indicate how the share of empty containers in total container throughput evolved in the past three months compared to the same period in 2019.

One out of four reporting ports deals with a higher than normal number of empty containers. Another 15% reports that the share of empty containers in total container throughput stands at a lower or much lower percentage. The number of ports that reported a significant imbalance compared to last year stands at just 8%. In particular, 6% of ports reported the presence of much

lower numbers of empties. Around 60% of ports reported a rather stable share of loaded and empty containers.

The findings of the Barometer show that the COVID-19 related shocks in maritime trade produced a rather wide imbalance of minor scale, which in aggregate creates conditions that affect shippers – and freights - in several regional markets around the globe. Since early 2020, a large volatility in demand caused by COVID-19 combined with more rigorous capacity management by carriers has contributed to high freight rates, recent equipment availability issues and high costs to reposition empty containers. Despite the observed volatility, the ratio full/empty containers served by ports has remained fairly the same.

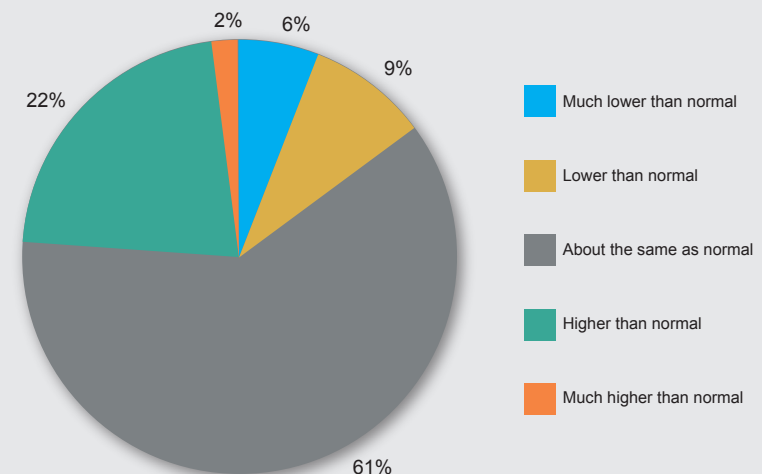
World Ports where successful crew changes took place
W6, 2021



IAPH WSP

By: Theo Notteboom - Thanos Pallas

Share of empty container throughput during the past three months



IAPH WSP

By: Theo Notteboom - Thanos Pallas

14. Impact of the Suez Canal Blockage of late March 2021

The Barometer survey of April 2021 included additional questions, asking ports to gauge the impact of the Suez Canal blockage—in late March 2021 by the 20,000 TEU capacity container vessel Ever Given. For six days, the situation remained uncertain. A traffic jam on both entries of the canal (the Mediterranean and the Red Sea) forced about 380 ships to wait. This captured the interest of global media, leading to speculation of detrimental supply chain disruptions and lack of port capacities to face the reestablishment of flows. Meanwhile, the event resulted in the diversion of several ships through the Cape Route around Africa, with shipping lines deciding to re-route some of their ships, even if this entailed about ten additional sailing days.

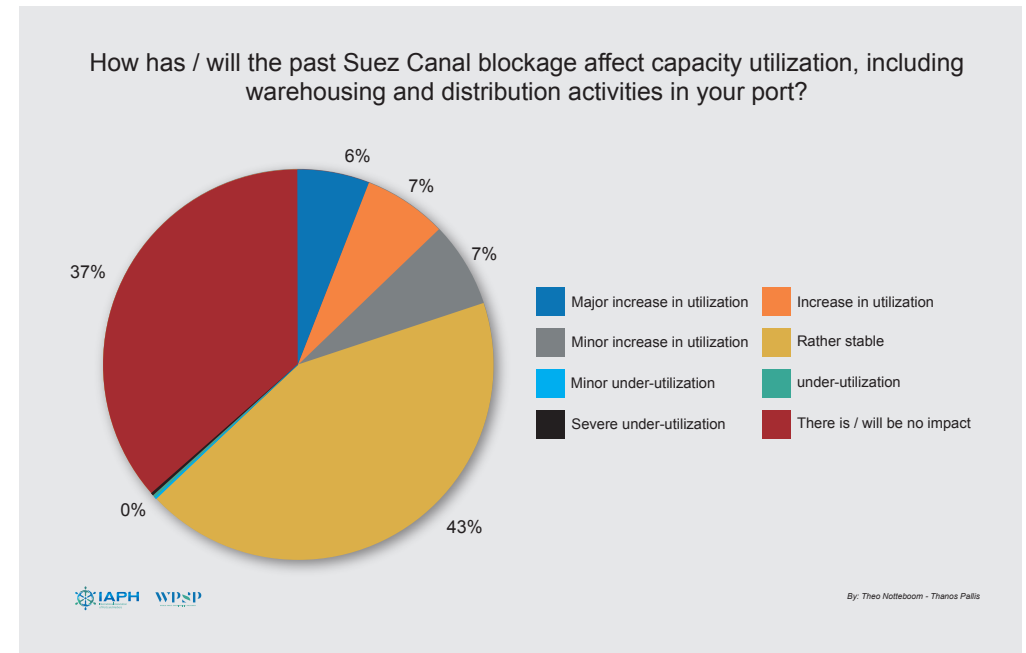
The Barometer explored what the implications of the unforeseen event for ports around the world are. It was proved to be a very uneven one with less severe consequences than was initially thought by many. These questions were also a reminder that not all ports host container vessels; for some, the interest is in other markets, so that in such particular cases, the impact is less.

The first question asked whether the event would affect the number of calls at ports. For 6% of the reporting ports, more than 25 vessel calls were already delayed or expected to be delayed. For another 4%, the number of delayed and expected to be delayed calls remained within the range of between 10 and 25 calls. Another 31% of ports would have to deal with the delay of a single number of calls. At the other end of the spectrum, 59% of the reporting ports are not affected by the blockage.

Conducting the survey two weeks after the blockage, ports still had to feel the impact of

the blockage. After one week since the end of the Suez blockage, there was still no noticeable increase in the number of ships arriving in many European ports. The full impact was not yet clear, and delayed vessels would have been due over the next week or two. There had been very little impact, but ports expected delays to take place 'a little later' both in ports hosting mother-ships and those hosting feeder vessels.

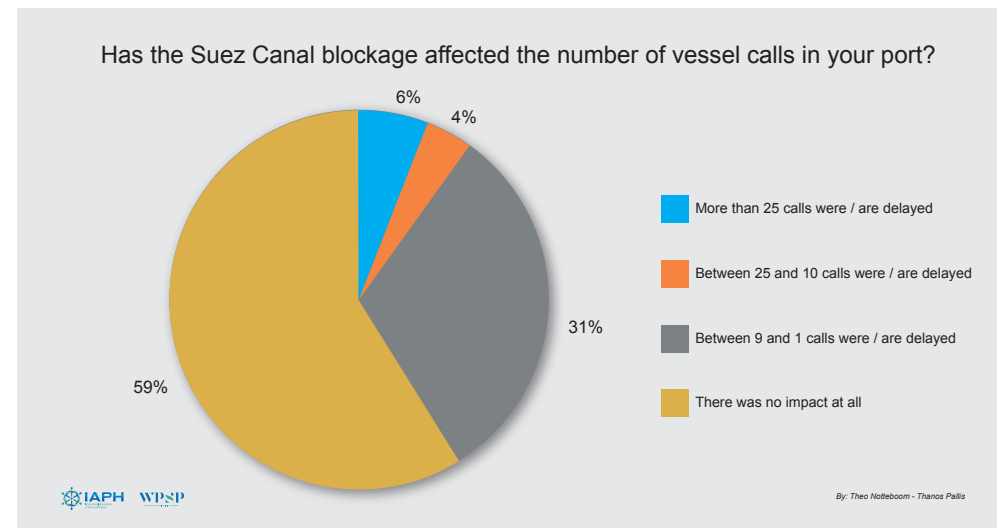
Not all ports are linked with vessels following the specific route, while the systematic impact of this ad hoc event seems to be minimal if any. They are two different markets. Much of the trade moved through Suez generally does not impact trade volume through the Panama Canal. To our knowledge, few, if any, of those involved in the latter market regularly have a business involving ships that transit through the Suez Canal. European ports, the receivers of much of the former trade, and Asian ports facilitating certain cargoes from westbound exports were expected to experience an impact. A few ports not strategically linked to the Suez Canal thought that the incident might impact the vessel traffic in the port indirectly.



One more issue highlighted is the interdependence of ports. As reported, any vessel call at a port follows visits to other ones. Any given ports depend on the smooth operations in other ports.

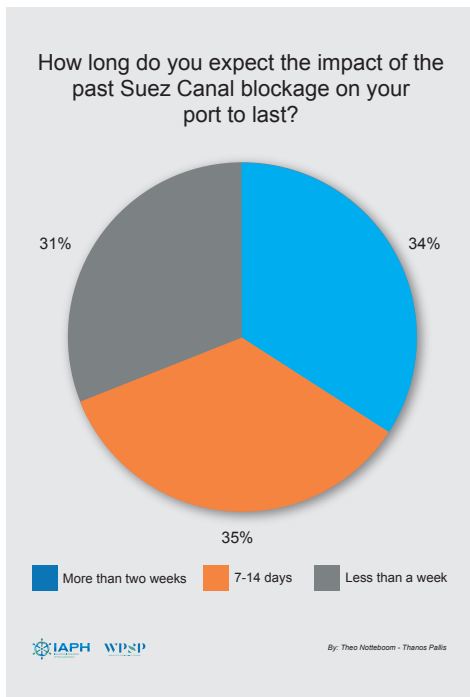
The disruption of ships' schedules and the altered arrival times produces an increase (7%) or a major increase (6%) of warehousing and capacity utilization in 13% of the reporting ports. For another 7%, the utilization increase due to the Suez blockage has been minor. The most impact is on container ports where berth utilization was expected to be down. Still, storage utilization expected to increase as exports and empty containers were building up and would need managing. For eight out of ten of the ports, there is no impact at all, a total that includes a number of ports that will face delayed arrivals due to the incident. This percentage demonstrates the capacity of several ports to handle delayed arrivals and unexpected volatility in cargo flows.

The replies have been divided and thus almost inconclusive regarding the time span of any implications that the Suez blockage might have on ports. Each of



the three potential replies was picked by approximately one-third of the reporting ports. 31% responding expect the impact to last a week, 35% expect it over a maximum of two weeks and the other 34% predict longer implications.

The unique character of the event and, not least, the continuous transformation of maritime supply chains (upscale of vessels, regular delays of vessels arrivals, better loading of containership with the use of technologies, capacity management, and vessel sharing agreements by alliance, etc.) contribute to a very dynamic situation that has both increased the adaptability of the industry, thus, resulting in the development of capacities to address challenges produced by uneven and/or delayed shipping arrivals.



15. Conclusions

The COVID-19 pandemic has generated diverse temporal and spatial impacts on world ports. It initially led to another global economic crisis with unprecedented consequences on global supply chains, and subsequently on port and shipping sectors. A major supply shock in Asia in early 2020 was followed by a significant demand shock initiated by lockdowns in the Western world. Since the summer of 2020, however, trade and cargo volumes have seen a remarkable recovery, particularly in segments that usually face declining demand during a crisis. As the daily lives of millions of people got centered around their own homes and expenditures on tourism and entertainment plummeted, we have seen a sharp rise in the consumption of durable goods (e.g. office equipment, home furniture, electronics) even when a percentage of the consumers lost a significant share of their discretionary spending capacity. An e-commerce boom further challenged supply chain managers.

While blank sailings and declining port throughput marked the first half of the analysis period in this report, the second half was characterized by container availability issues, very tight vessel capacity, and terminal congestion. The resulting disruptions in global supply chains were further reinforced by other events such as the Suez Canal blockage in late March 2021.

From a supply chain perspective, the COVID-19 pandemic is unlike any other economic disruption, leaving port managers with little clues and certainties on how things continue to evolve. More than once, port-related staff at terminals, storage, and distribution facilities, and inland transport operators had to quickly adapt to a fast-changing environment. In this respect, the pandemic is considered one of the biggest tests for the resilience and adaptability of

the global shipping industry and ports. World ports passed this test with flying colors, even though occasional hick-ups and learning-by-doing could be observed. Despite heavy restrictions on economic and personal lives, ports have remained operational, serving trade flows under different operating and commercial conditions.

The pandemic also demonstrated that information exchange, sharing of (best) practices, and co-ordination/cooperation among all relevant actors are essential to ease the storm and to be even better prepared for future disruptions. In this context, improving the risk and resilience of world ports presents a never-ending necessary and exciting journey for the global port community.

We believe the Barometer reports have a role to play in this process. With the regular input of IAPH member ports around the globe, the IAPH-WPSP COVID-19 Economic Impact Barometer surveyed and recorded the way that this crisis affected the number of vessel calls, challenged the provision of hinterland transport facilities and warehousing and distribution activities, led to shortages of port-related workers, imposed restrictions on vessels and changes in port call procedures, and altered investment plans. The Barometer was developed to inform and assess the pandemic's impacts.

The Barometer reports covered one year since the start of the COVID-19 pandemic. They provide relevant inputs to better prepare ports for addressing risks, for preparing and planning ahead of disruptive events, and for building resilience for all types of disruptions, including pandemics but also climate change, security breaches, and others. Against the background of a disruptive COVID-19 pandemic, the Barometer highlighted the wide-ranging vulnerabilities and threats. We would like

to thank all ports around the globe that contributed by responding to the Barometer surveys and providing valuable comments on the impact of the pandemic on their ports.

The planning for the many unknowns that can disrupt ports is a complex and multidimensional process that involves making strategic decisions amid a high degree of uncertainty. The Barometer findings and their analysis revealed the need to adopt a supply chain perspective when aiming to develop port strategies that minimize risks and build resilience to disruption. These resilience-building capabilities go well beyond the ship-port interface (within port operations and services) and include landside connections, as well as nautical services. Bottlenecks and buffers disrupting smooth and agile flows might occur at any part of the chain, thereby diminishing the capacity of maritime transportation to serve trade flows efficiently. Accordingly, any global tracking mechanism aiming to monitor trends, mitigate risks, alleviate impacts and build resilience should focus on the maritime side of the port, the in-port conditions, and the landside operations.

Looking ahead to the way forward, the IAPH Risk and Resilience Technical Committee is developing concrete actions to monitor and develop an early warning system, generating meaningful intelligence circulated on time rather than retrospectively. With the contributions of science, there are strong indications that other disruptive situations will come along within a post Covid-19 pandemic era.

While this report marks the end of the IAPH-WPSP COVID-19 Economic Impact Barometer as we know it, the Barometer exercise will continue, in a modified form as part of a broader and integrated exercise on risk and resilience, digitalization and market-related indicators and initiatives.

16. Further information

This report will now be published on the World Ports COVID19 INFORMATION PORTAL under the FAQ section "WHAT IS THE ECONOMIC IMPACT ON THE GLOBAL PORT SECTOR?".

About International Association of Ports and Harbors

Founded in 1955, the International Association of Ports and Harbors (IAPH) is a non profit-making global alliance of 170 ports and 140 port-related organizations covering 90 countries. Its member ports handle more than 60 percent of global maritime trade and around 80 percent of world container traffic. IAPH has consultative NGO status with several United Nations agencies. In 2018, IAPH established the World Ports Sustainability Program (WPSP). Guided by the 17 UN Sustainable Development Goals, it aims to unite sustainability efforts of ports worldwide, encouraging international cooperation between all partners involved in the maritime supply chain. WPSP (sustainableworldports.org) covers five main areas of collaboration: energy transition, resilient infrastructure, safety and security, community outreach, and governance.

[The WPSP-IAPH COVID19 Portal](#) draws on the expertise of Task Force participants and members of the Risk and Resilience Committee of IAPH, who include specialists from the ports of Açu, Antwerp, Los Angeles, Felixstowe, London, Busan, Guangzhou, Mombasa, and Rotterdam. Additional valuable contributions have come from sixteen other port authorities, several regional port associations, experts from the World Bank, Professors Theo Notteboom and Thanos Pallis, as well as Maritime Street, a consultancy specialized in digital trade logistics.

About the authors

Theo Notteboom is Professor in maritime and port economics and management. He is Chair Professor at the Maritime Institute of Ghent University, and a part-time Professor at Antwerp Maritime



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maritime transport systems. He is co-director of PortEconomics, the Vice-Chair of the Port Performance Research Network (PPRN), and President of the International Association of Maritime Economists (IAME). He has been a member of the WPSP-IAPH Task Force on COVID-19 and is active in the Risk and Resilience Committee meetings of IAPH. He co-authors the book Port Economics, Management and Policy to be published by Routledge in 2021.

