

# Managing Pandemic Crises in Shipping: Experience and Lessons

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*The paper analyses different aspects of management response to pandemic crises in shipping, as a part of global effort to find the best practice for ensuring health and safe social and working behavior. The main objective was to explore the interconnected challenge of how to balance between carrying out global logistics and maintaining the health of shipping personnel. The methodology involved a detailed examination of the currently available regulations and existing research studies. Through qualitative descriptive analysis of dataset, the paper offers insights into risks and challenges in managing the pandemic's needs, highlights topics specific to corresponding risks in shipping, and gives evaluation of applied risk-mitigation measures. In the context of COVID-19 infection, empirical results revealed that the implications of the pandemic were widespread, but that maritime supply chains had largely adapted to the new conditions using comprehensive emergency-response mechanism. Key findings in this paper underscore significant progress in the shipping industry's approach, so that crisis management may be characterized as prompt and effective. The pandemic's legacy, as well as the recommendations for further improvements, are presented in conclusions. The paper also identify a need for long-term considerations for sustainable development of the maritime sector in the post-pandemic world.*

**Key Words:** *Pandemic, Corresponding Measures, Occupational Health, Crisis Management, Shipping*

## 1. INTRODUCTION

On January 30, 2020, the World Health Organization (WHO) declared the 2019 coronavirus disease outbreak a public health emergency of international concern, and on March 11 declared the outbreak a global pandemic. On May 05, 2023 WHO proclaimed the end of this event, stressing that it does not mean the illness is no longer a threat [1]. This is the latest, but not the last emergency caused by contagious disease that was observed and resolved in the past (such as the SARS infection in 2005, the influenza AH1N1 epidemic in 2009, the Ebola virus disease in 2013 in West Africa, and the MERS in Middle East in 2014 and 2015). These events caused similar cascades of issues

and had a serious impact in both a social and economic dimension, even though not to the same extent as COVID-19 pandemic.

When disturbances such as pandemic occur, maritime works as a transmission channel that sends shockwaves across supply chains [2] and can thus considerably endanger world trade and the global economy. A pandemic affects all aspects of doing shipping business, including maritime transport (in volume and value) and onshore logistics, staff operability of seafarers and ashore staff working capabilities, and the functional and environmental performance of ships and ports. Key risks relate to health and safety, work and finance, food and energy security, cyber and environmental impacts. Challenges which must be addressed in the time of pandemic relate to various areas of regulation, as well as to harmonization of maritime policies.

Hence, of any potential solutions to trouble posed by a pandemic, the primary requirement was to address the interconnected challenge of how to balance between carrying out the basic functions of the shipping

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business and global supply, while safeguarding the health of shipping personnel as a priority [3]. Replications to the similar crises in the past could form a foundation for possible decisions, but were clearly not quite adequate to recent situation. With awareness of this fact, the approach of relevant actors in solving problems caused by COVID-19 crisis, as well as for potential future shocks, has to be based on a global framework in regulatory and operational dimension.

Therefore, the basis of the research approach is using primary data sources, including existing health conventions and operational guidelines, as well as available research studies issued by professional (maritime and trade) organizations. The research methodology adopts a qualitative descriptive approach, including critical analyses and comparisons of selected papers, and synthesis of their findings, in order to derive new insights into the current response and future proofing to maintain sustainable industry.

Consequently, the paper is structured into four chapters. After the introductory part, the second chapter presents key topics in health and business regulation for navigating pandemics in shipping. The third chapter refers to management requirements and multifaceted aspect of impacts and responses to recent COVID-19 crisis, including risk mitigation measures and key performance indicators of the shipping business. Conclusions of the research refer to lessons learned during the pandemic, limitations and ways necessary for a systematic guidance shocks in the new global environment, as well as long-term considerations and perspective on future research in the industry.

## 2. REGULATORY FRAMEWORK

In response to an emergency posed by a pandemic, WHO and other relevant healthcare institutions (on international, regional and national level), as well as professional associations (including maritime, trade, transportation and labour organizations) were faced with the need for a prompt and effective reaction. They were invited to create a regulatory framework for ensuring appropriate social and working behaviour suited to the level of the threat. Lessons learned from former disease outbreaks were a solid basis for incorporation into common regulation for COVID-19 pandemic crisis.

Through comprehensive and indepth exploration, the selected regulations can be synthesized into two main groups. The first group of regulations are aimed to publichealth protection of the global community. The second set of documents are specific for the shipping community in both health care and business operability aspect.

The health regulations for managing pandemic crises in general include basic laws and declarations, as well as interim guidance for COVID-19 which were declared by WHO [1] and, under WHO International Health Regulation [4], were issued by other competent regional and national institutions for publichealth (such as the American Centres for Disease Prevention and Control, or the European Centre for Disease Prevention). These regulations give general guidance aimed to prevent, protect, control, and provide a publichealth response to the global spread of illness. Also, they highlighted topics specific to corresponding health risks in shipping [5], [1], including:

- contingency planning;
- health protection referring to medical care, and nutritional and psycho-social support for seafarers and other personnel on board ships and ashore;
- health-response measures on board ships and ashore;
- ships inspection and sanitary protection on board ships, in ports and ports environment.

In the line with guidance from WHO and the recommendations of healthcare authorities, relevant professional bodies, together with other shipping stakeholders (including ports and shipping companies, ship owners and operators, shipping managers and employees, maritime administrations and port authorities, as well as state governments and national institutions), issued a compilation of conventions, as well as practical advice. This alliance of associations included the International Maritime Organization (IMO), the International Chamber of Shipping (ICS), the International Labour Organization (ILO), the International Transport Workers' Federation (ITWF), the United Nations Conference to Trade and Development (UNCTAD), and the like. Issued documentation contained requirements for upgrading occupational health and security of maritime personnel and „third parts“ (passengers, visitors and other participants), as well as for the quality of operations and environmental protection.

Further, these regulations gave a range of good practices on immediate measures, as guidelines to the shipping community as to how to put in order the effective functioning of the supply chains during a pandemic, including:

- ways of crewchange facilitation [6], [3], [7];
- relaxing of requirements for seafarers certificates and ship licenses, quality inspections and audits [2], [3];
- vaccination for seafarers [8];
- measures for operational adjustments on shipboard and in ports, and for facilitation of maritime traffic [3], [2], [9], [10];

- procedures for prevention of marine pollution [11], [3].

Systematic analysis of the currently available regulatory framework for managing pandemic crises in shipping shows that the legal basis and regulatory developments could be evaluated as appropriate in a content. But, the point was to find ways to implement mandatory and recommended provisions that address shipping risks and challenges in order to achieve health and operational preparedness, and readiness to respond effectively to a pandemic's needs.

### 3. CRISIS MANAGEMENT

To accomplish coordinated and unified responding to pandemic crises (on example of recent and the most complex COVID-19), all ports and shipping companies (as key maritime players) were required to find ways to enforce the compulsory and recommended provisions in maritime business in order to reach adequate results. Port authorities and shipping managers were asked to define specific actions in line with the global and national regulations as strategic guidance for disease outbreak, as well as various types of technical and operational guidelines developed by professional bodies. Further, using risk-based approach, they had to include them in new preparedness and contingency plans, and corresponding protocols and business policies. At the end, together with marine personnel on board and ashore, they were responsible to implement them in business practices.

The comparative analysis of regulations and research papers provides insights into series of activities aimed at different issues, including health and legal protection, business and finance stability, safety and cyber security. They might vary in a scope and type among maritime players depending on their capacity to adopt upgraded requirements for effective management systems and their capability to apply immediate interventions.

#### 3.1. Key Problems in the Time of Pandemic

The main issues that need answers in navigating shipping business during a pandemic arose from an emergency-response mechanism that was established in accordance with the regulations created for such a threat. The analysis of the selected dataset highlights emerging problems related to restrictions and correlative activities applied to ports, vessels and seafarers movement.

Limitations in cross-border movement targeted ports and ships operational ability. Port closures and preventative measures in ports led to temporary ship entry suspension (even a formal prohibition) or delaying the departure of ships until a sanitary inspection was finished. Restrictions to vessels jeopardized the

continuity of the shipping business causing delayed port clearance, followed by retention in cargo deliveries and supplying the world with necessities, as well as the unavailability of essentials on board ships. Both, constraints in ports and to ships movement, led to congested ports and longer dwell times, and undermined service reliability [12]. Also, these restrains gave rise to a deficiency in storage capacities in ports, and in equipment for monitoring supply chains and detecting potential disruption in tracking shipments to their destinations.

As a consequence, restrictions to seafarers cross-border movement denied their human and labour rights [7]. Limitations to disembarking prevented existing crew members from being replaced and repatriated home after long shifts at sea. Limitations to embarking prevented new seafarers from joining/replacing the crew and working, which had dire implications for their personal income. Both was unsustainable for crew health and well-being, as well as the safety operations. In addition, „frozen“ hiring plans and short-term unemployment, especially for maritime personnel ashore, as well as acquiring adequate skills for digitized environment, opened another set of issues related to the pandemic.

#### 3.2. Key Areas of the Management Response

Searching for ways and instruments with which to face the pandemic's issues, crisis management in ports and shipping companies largely applied advice which was posted by IMO [3] and defined in upgraded the ICS maritime guidance [9]. In addition, key maritime players were obliged to take into account the formalities for ships calling in ports (including those related to the arrival and departure of seafarers) which was declared by World Trade Organization (WTO) in the IMO Convention on Facilitation of International Maritime Traffic [10]. Toward, port authorities and shipping managers ensured that their employees were familiarized with companies' plans and procedures for health and safe social and working environment and behaviour.

Qualitative analysis of the selected database shows that the maritime response to pandemic-related disruptions was widespread, covering the set of three groups of risk mitigation measures and correlative methods for their implementation in practice. They were primarily related to public-health protection and adaptation of working practices, secondly to business operations adjustments, and to customising of their business policies.

Responding to health threatens to seafarers and other maritime participants, ports and shipping companies ensured personal safeguard (protective equipment, hand hygiene in prominent places, physical

distance and social distancing to the extent possible). In addition, they upgraded and installed pre-boarding and after-disembarking screening protocols in ports, as well as contingency plans on board ships, in order to facilitate all activities required for the mitigation of disease transmission and providing necessary medical aid on board and ashore. Also, in order to protect occupational health and safety working conditions were adjusted, including reorganizing work and longer shift changeover times, rotation schemes and operational teams on a weekly basis, telecommuting and remote work, and videoconferencing and online meetings. Besides, maritime companies applied sanitary protocols for disinfecting stuffs or deliveries, surfaces and working spaces on shipboard, in ports and the port area, as well as the safety operations for disposal of hazardous waste [11].

As a crew members are still a major challenge for humanitarian, safety and employment-related reasons, shipping stakeholders insured that seafarers (as well as other marine personnel) were protected, had access to medical support (on board and ashore), and were recognized as „key workers“ [3]. This status, as well as seafarers exemptions from national travel-related or health-related restrictions (regardless of nationality or travel history), accelerated considerably maritime mobility and global supply flows. Crisis management in the maritime sector was concentrated on enabling safe and unhindered movement for embarking or disembarking a vessel, and accepting flexibility in diverting ships to ports where crew-changeover was possible. Toward, together with relevant national authorities, ports and shipping companies were engaged on relieving the procedures of the extension of the validity of employment agreements and seafarers certificates (health, competence or labour), and the ship licenses (statutory, safety, sanitation, and others) which would remain in force until they were duly repatriated or ships were anchored in ports. Hence, recognition of seafarers as „*key workers*“ made a significant progress in insuring respect for their rights, including solving the human and labour issues (such as length of service, crew-change, repatriation, earning income), and providing health and safety at work. Also, international seafarers became a priority in national vaccination programmes (especially in developing countries, since seafarers come predominantly from these regions) in accordance with the IMO guidelines, and the ICS practical guide and an implementation roadmap [8].

In response to business risks, the majority of ports provided special storage places for medical supplies and additional storage facilities for cargo. Additionally, in order to supply vessels with necessary stuff and facilitate logistics chain connections, port

personnel (managers and staff) installed and implemented „fast lanes“ for essential supplies and services, followed by „fast lanes“ for non-essential consumer goods [2]. Furthermore, due to the capability of the shipping capacity to work more flexibly and match lower levels of demand and the oversupply of ships, the revision of the capacity management was a key adjusting measure for reducing the costs and preventing the collapse of freight rates. The rearranged global trade patterns, such as multiple-location sourcing and shorting distribution channels, rerouting and introducing additional spaces for sufficient safety stocks, forced shipping managers and employees to develop and realize new strategies for maritime transport. New logistic channels ranging from short-sea shipping networks or idling sailings, to just-in-time or just-in case supply chain models and flexible and agile hybrid forwarding solutions. In addition, maritime companies embraced technological advances, capitalizing on digitalization possibilities and e-commerce opportunities, which was redefining business success and facilitating intermodal operations [12].

Although some of technical and organizational interventions have disrupted some segments of the shipping business causing the problems mentioned earlier, they were inevitable and also valuable. Innovations and automation of processes had facilitated trade and cross-border logistics, optimizing port and ship operations, simplifying administrative and regulatory procedures, and providing health and safety services. Consequently, IT solutions boosted efficiency along supply chains (in export, import and transit operations), as well as cost-saving and quality of processes in shipping [12]. Together with using cyber-risk management approach, different smart digital solutions improved cyber-security, while protecting shipping assets from increasing cyber-threats. An impact of automation, but, posing challenges related to loss of jobs positions and workforce displacement (mostly ashore), as well as a lack of required skills and knowledge.

In order to alter business systems, port authorities and shipping managers were focused on customising policies to new requirements. The adjustment of a commercial policy pertained to the improvement of risk assessment and commercial risk-allocation. Changes in an investment policy referred to concluding the arrangements for long-term rates of return on invested capital. Finding new financing channels for balancing less returns and increased economic or social costs were related to state financial assistance covering compensation for lost revenues in a form of direct state aid or tax exemptions, as well as liquidity support in the form of loan guarantees and „free liquidity“ from state banks [2]. In addition to the

primary goal of protecting health of the crew and well-being of seafarers, the second priority in maritime labour policy was to take care of „engaged“ working positions, by changing operational dynamics (relocation and shortening the working week or daily working hours), reshaping the skills requirements, and implementing new organizational strategies and employment patterns within the shipping industry [13]. Improving communication policy was directed to insure a safe ship-board interface.

### 3.3. Dynamic Performance

The selection of research studies that evaluates the impact of COVID-19 on the shipping industry's performance was limited and might not encompass all relevant topics. But, systematic analysis of these papers provide valuable insights into the scope of the pandemic's influence, as well as the strength of the management response to recent crisis.

The results of available empirical study which measured the pandemic's influence of COVID-19 on maritime supply chains [14], underscored that the implications of the pandemic were widespread, but that the response of the shipping industry's management were effective and efficient. According the findings, during the first strike of the disease (in 2020 and the first half of 2021), the maritime sector faced and „survived“ numerous and severe challenges. About 60 per cent of maritime players were significantly affected, while 25 per cent were moderately affected. About 50 per cent of them were hit by delays across supply chains (from ports to customers), whilst 40 per cent had experienced the insufficiency of capacity (mostly for warehousing). Response results showed that the maritime transport system adapted its operations to the pandemic's conditions up to a level of 92 per cent.

In addition, pressure to employees (seafarers, and on board and ashore personnel, as well as managers) were enormous. Statistical data [15] presented the crew crisis triggered the event when approximately 300,000 seafarers were requested to stay on board beyond the period originally foreseen in employment agreements, even beyond the default 11-month maximum period of service derived from the provisions of the Maritime Labour Convention [6]. The same number of unemployed seafarers were ashore waiting to join their crew [15]. Despite comprehensive respond of relevant shipping stakeholders and intensive international efforts, the crew-change has worsened and seafarers were still facing serious problems. Global Maritime Forum overview [16] gave critical insights into the crisis. Over time more than 400,000 crew were „trapped“ on board their ships among of around 1.9 million seafarers working to relieve the way we live.

Descriptive analysis of UNCTAD data has unveiled insights into multi-faced aspect of impacts and responses to pandemic in shipping [2]. Immediate pandemic-related measures in the initial period of application (in 2020 and the first half of 2021) caused a reduction in productivity (until the protocols were adjusted to), while later, ports and maritime transport services recovered ground [3], with productivity reaching the similar levels recorded before the disease outbreak.

As interventions relented from the second half of 2021, and the world trade gradually recovered but with supply was less elastic and constrained by delays and congestion, freight rates and fees rose significantly, as did the industry's profitability (especially in container shipping). As it was expected, larger ports with more ship calls and shipping companies with larger ships had achieved better results owing to the economies of scale.

Despite the shipping industry defied interruptions, performed better than anticipated. Comparative analysis of UNCTAD data publish in regular annual reports underscored that the international maritime trade flows fell by 3.8 per cent in 2020, less than it was projected to contract by 4.3 per cent [12]. With easing in the pandemic in 2021 and corresponding overall improving in economic conditions and increasing in consumers spendings, total exchange reached expected recover. Seaborne trade bounced to 3.2 per cent growth in volume and more in value [17], due to the „hunger“ for goods and services followed by an acute shortages of commercial fleet which caused multiple increase in freight rates and profitability.

The 2022 performance reflected the extraordinary market surge in 2021, but into new non-potential global environment. Extended period of the COVID-19, followed by macroeconomic instability (inflation higher than seen in several decades and cost-of-living explosion), geopolitical tensions (the war in Ukraine and other regional crises), commercial pressures (weakening in China's economy), and undulated commodity and financial markets (luck of food, energy crisis, contraction of financial conditions) resulted in the weak growth in maritime transport at the start of 2022.

In 2022 this new wave of challenges for global supply chains and logistic concerning expanding distances, as well as the huge growth in transport costs and weakened demand, caused decline in international maritime trade flows, but marginally by 0.4% [18]. Still, UNCTAD projected seaborne trade will continue to grow for the foreseeable future, but at a slow pace by 2.4 per cent in 2023, and 2.1 per cent (moderate growth) over the next five years [18].

### 3.4. Summary

The finding in this research revealed that the shipping industry's response to recent pandemic crisis was prompt and effective, comprehensive and balanced. Altering their policy and system to a „new normal“ business practice, the maritime sector made the workplace a safe environment for the employees, allowing maritime mobility [19] and cross-border trade, and prevented the collapse of economies and societies worldwide.

Ship operators alleviated the early shock and managed restriction in movement and lower levels of demand, as well as ports and landside operations struggled to adjust. Risk-based approach enabled ports to become more resilient and provide both safe and swift cargo handling, as well as insured the smooth transport by maintaining nautical services onshore and backing the ships at sea. Besides, the maritime sector maintained efficiency, precluded the collapse of freight rates and protected business and financial returns, while preventing the quality of services, and contamination of on board and ashore environment. Thus, relevant stakeholders proved that they were capable and willing to solve the main interconnected challenge by finding appropriate solutions aiming to ensure social, economic and environmental sustainability. The industry retained a leading position in international cargo transport and global merchandise trade with participation of more than 80 per cent by volume and 70 per cent by value.

The research also impart critical insight into several aspects, such as a crew crisis, certain imperfections in the maritime transport chain, and a logjam in global logistics, concerning lack of preparedness, capacity management, and regulation [20].

## 4. CONCLUSIONS

Although an end of COVID-19 pandemic as a public health emergency at the global level was declared in the 2023, shipping continues to navigate postpandemic trends, the legacies of the crunch in global supply chains, and extended containment measures which persistently affect the economic and trade performance. Additionally, the maritime industry faced with new challenges of multiple crisis, including the reopening of the world economy, new economic headwinds and commercial policy tensions, geopolitical risks, growing environmental regulation, and a heightened sustainability. Together, these forces are adding complexity, volatility, and uncertainty to the industry's operating landscape. According to systematic review and analysis of available data in this research, there are very few industries capable of doing what maritime has achieved. Mistakes were made,

including a lack of coordination and solidarity, which meant that existing tools and technologies were not best used to combat the crisis. In spite of inconsistencies have been bound to happen in emergencies, situations have been overcome with the right risk management, so that the socioeconomic implications were much less than it was expected.

A few of aspects that have been decisive in navigating crises, and new insights which have given further clarity on the immediate implications on policies and behavior of various stakeholders created the legacy.

Relevant experience in managing recent pandemic crisis refer to:

- the primary role of risk assessments and emergency response planning;
- significant changes in globalization patterns and the spending habits of consumers;
- shifts in geography of trade patterns and global logistic (supply chain reconfiguration and new cargo-forwarding solutions);
- an importance of ship caring capacity management;
- maritime trade facilitations and resilience-building of transport networks (e-commerce opportunities based on digitalization);
- a necessity for a wide range of new skills and knowledge in the shipping community;
- a swift intervention at policies and regulatory developments;
- integrity of standards, interoperability of management requirements, and global interdependency in application;
- connectivity strategies and a systemic response at the global level.

In the context of presented findings, it is substantial to recognize some limitations in this research. The main limitation is the reliance on primary data sources. Existing regulatory framework for pandemic crises may not encompass all relevant problems and topics relating to shipping. Empirical studies which are available to researchers limit their potential to analyze additional aspects of the pandemic's impact on maritime supply chains. Furthermore, research studies may vary in quality and depth of analysis, and the interpretations of their results may be influenced by the researchers perspective and expertise. Nevertheless, systematic analysis of these papers provides valuable insights into the current state, emerging trends, and potential areas for further examination within the field of maritime resilience and sustainability.

An improved understanding of how players in shipping coped with pandemic crisis is decisive for

gaining insight into their readiness for ongoing and perspective shocks. Managing the world economy in the new global context implies higher responsibility of all subjects for broader public targets, including commercial, social and environmental objectives, both inside and outside the core industry. Looking ahead, the maritime sector needs to rethink its role and must continue to monitor trends and assess how these are affecting an increasingly volatile and uncertain operating landscape. Further research is needed to develop holistic approaches that can guide policymakers and industries stakeholders in adopting matching strategies.

Even the short-term economic outlook is positive, the mid-term and longer-term cares of the world recovery remain. Perspectives for future research studies in industries refer to the arising question of whether the pandemic's experience will accelerate the existing tendencies, such as growing geo-economic fragmentation and threats to multilateralism and the global trading system, or attenuate them, by encouraging progress towards sustainable development and abandoning the „self-sufficiency“ concept, which both request an adequate response in maritime supply-chain design. Additional efforts have to be made in improving risk assessment, better preparedness and opportunely planning, strong organization and robust governance with flexible future-ready systems supported by relevant policies and decision-making processes. Also, improved shipping response to potential shocks requires the development of coping strategies based on coordinated public policy initiatives for:

- better cargo holding, higher operational efficiency and resilience of logistic chains;
- accelerated use of IT solutions;
- strengthening competitiveness and widening the scope of competition;
- improving monitoring and transparency;
- long-term financing;
- extended investments in industry's capacity (ships, infrastructure and competencies);
- innovative and greener shipping industry;
- stricter standards throughout the workforce, quality, safety and security.

The efficient use of the whole marine personnel potential, together with proper distribution of staff strengths in terms of combining with other resources, would be a part of building the value of shipping companies and further development of the whole maritime industry, contributing successfully to deal with multiple generated crises. In addition, broader participation and collaboration across the maritime supply chain calls for stronger public-private-partnership platforms. Despite stakeholders in maritime transport

chain have different interests, key maritime players (shipping companies and ports) have to make permanent progress in cooperating and finding ways of engaging the wider industry.

In parallel, the other maritime participants (particularly producers and the cargo owners, charterers and distributors, investors and creditors, as well as national authorities) have to be encouraged to involve more forceful and with more commitment, and cooperate (not to compete toward own interests) both individually and collectively in solving arising problems [21]. One voice of the entire shipping community in addressing challenges related to occupational health, quality and safety, leads to greater elasticity and sustainability in the post-pandemic world.

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## REZIME

### UPRAVLJANJE PANDEMIJSKIM KRIZAMA U BRODARSTVU: ISKUSTVO I LEKCIJE

*Rad analizira različite aspekte upravljačkog odgovora na pandemijsku krizu u brodarstvu, kao deo zajedničkog napora u traženju najbolje prakse za osiguranje zdravog i bezbednog socijalnog i radnog ponašanja. Glavni cilj bio je istražiti međusobno povezani izazov, kako balansirati između odvijanja globalne logistike i održavanja zdravlja brodarskog osoblja. Metodologija je uključivala detaljno ispitivanje trenutno raspoložive regulative i postojećih istraživačkih studija. Kvalitativnom deskriptivnom analizom seta podataka, rad nudi uvid u rizike i izazove upavljanja potrebama u pandemiji, osvetljava teme specifične za odgovarajuće rizike u brodarstvu, te pruža evaluaciju primenjenih mera za ublažavanje rizika. U kontekstu COVID-19 infekcije, empirijski nalazi su otkrili da su implikacije pandemije bile široko rasprostranjene, ali da su se pomorski lanci snabdevanja, u velikoj meri, prilagodili novonastalim uslovima primenom sveobuhvatnog mehanizma za reagovanje u vanrednim situacijama. Ključni nalazi u radu pocrtavaju značajan napredak u pristupu brodarske industrije, tako da se krizni menadžment može okarakterisati kao blagovremen i efektivan. Nasleđe pandemije, kao i preporuke za dalja unapređivanja, prezentovani su u zaključcima. Rad, takođe, identifikuje potrebu dugročnih razmatranja održivog razvoja pomorskog sektora u post-pandemijskom svetu.*

**Ključne reči:** *pandemija, korespondentne mere, zdravlje zaposlenih, menadžment rizikom, brodarstvo*