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Embracing the Next Normal of Health and Safety Implementation in Indonesian Companies, a Lesson Learn from Disruption Risk of Covid-19 Pandemic

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Article Info

ABSTRACT

The COVID-19 pandemic impacted the socio-economic sectors since the end of 2019. Indonesian's Government issued the large-scale social restrictions policy to limit the industrial activities. This study aims to investigate the difference of the Health, Safety, and Environment (HSE) implementations among Indonesian companies, before and during the disruption risk of COVID-19 pandemic. It used a random sampling, involved 1,027 workers from various sectors of Indonesian companies. Hypothesis tests used are ANOVA and t-test method. The level of HSE compliance changed quite significantly when the COVID-19 outbreak emerged. The results explained, there is no significant difference in HSE compliance based on company location, company risk level, and position of a respondent in the company. However, there is a significant difference in the increase of HSE compliance between companies that have a HSE division and a HSE Management System certificate with the company who did not have any. The recommendations of HSE improvement formulated using a Safety Model Canvas and a Focus Group Discussion conducted to convey the jazz scenario in the next normal. This study suggests the priority order for HSE improvement strategy in a company is commitment, responsibility, engagement & involvement, leadership, competence, information & communication, to organizational learning.

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1. INTRODUCTION

At the end of 2019, a new pneumonia case emerged from Wuhan in China, which quickly spread to more than 212 countries. This outbreak is called Coronavirus Disease 2019 (COVID-19). In general, it spreads through fluids that come from coughing, sneezing, and kissing [1]. On March 2020, the World Health Organization (WHO) announced COVID-19 as a pandemic [2]. If the COVID-19 pandemic situation continues and deteriorating, the Congressional Research Service estimated that world economic growth in 2020 would decline by 6 - 7.6% [3]. Not only does this impact the economic sector, but this situation also affects the society [4]. In this situation, most countries in the world applied lockdown in their country.

There were 33,076 positive cases of COVID-19 per 9 June 2020 in Indonesia with a mortality rate of 5.81%, which is the second-highest rank in the Asia Pacific [5]. To cope in this situation, Indonesian's Government implement several policies such as the Regulation of the Health Minister of the Republic Indonesian Number 9 of 2020 concerning on large-scale social restrictions. This regulation suspend various sectors of economic activities and freed some sectors from the suspension, such as the health service sector, food needs, and several companies related to other basic needs, to fulfill the basic needs and supply chains for the society [6]. COVID-19 is one of biological hazards in the workplace that can result in threats to the health and safety of workers. Therefore, companies that continue to operate are required to comply with the health protocol recommended by the WHO through the Minister of Industry Circular Number 4 of 2020 as a form of implementing the new normal in avoiding the transmission of COVID-19. The other forms of risk identify [5] in a company are operational risk and disruption risk. Based on the International Labor Organization (ILO), 88% of work accidents caused by unsafe acts, 10% caused by unsafe conditions, and 2% caused by unforeseeable factors [7]. Work accident that occurs caused by the unsafe acts or conditions are related to operational risk, where the accident involves workers and daily operational processes. This operational risk control is the domain of HSE discipline enforcement in a company. Disruption risk can take various forms, such as natural disasters, terrorist attacks, and else which expected to have a negative impact [8]. This term is known-well in the field of supply chain, where while disruption occurs in a part of the chain, the outcome could have a more severe impact on the other parts [9]. Companies need to integrate disruption risk management into operational risk management [8]. Likewise in HSE management in a company. As a result of the COVID-19 that is spread easily and it is assumed as an unforeseeable factor, the disruption risk that occurs due to COVID-19 notables for the HSE division and company workers in addition to existing operational risks. It also could hinder production performance and even disruptively shut down production. Thus, numerous conditions of implementing health and safety in companies in Indonesia is predicted to increase.

During the COVID-19 pandemic, there were several researches about safety published. Haghani *et al* conducted scientific literature on the Coronavirus [10]. The result explains that an interdisciplinary approach and collective scientific efforts are needed to help understanding and reducing the various safety impacts of the COVID-19 pandemic, in addition to an understanding of the biomedical risks that exist in COVID-19. According to Lemke, Apostolopoulos, and Sonmez, COVID-19 triggers multi-level stress for drivers that could form behavioral and psychosocial responses that affect their health and safety [11]. In other research, Adesoye *et al* applied clinical operation learning using teleconference platforms due to the impact of the COVID-19 pandemic [12]. Haghani *et al* also summarize the safety dimensions and show parts of each based on the compilation of research published during the COVID-19 [10]. There are ten dimensions, including blood safety, surgery, occupational safety of healthcare workers, and else. The safety dimensions in previous researches focused more on the medical subject area. There was no research focuses on analyzing the effect of disruption risk of COVID-19 on increasing safety awareness in companies.

With the disruption risk of COVID-19, an unforeseeable factor that can endanger workers, this research focuses on investigating whether there is an increase (or not) in health and safety or HSE implementation in companies in Indonesia using surveys and statistic tests. The measurement used is the HSE implementation, which is not only based on compliance with COVID-19 itself but also related to the compliance concerning operational risk. The recommendations from the results acquired is formulated using the Safety Model Canvas (SMC) through Focus Group Discussion (FGD) with cross-sectoral safety experts, so that lessons learned from the existence of COVID-19 disruption risk are obtained. Suppose this study proves that there has been an increase in HSE compliance in companies in Indonesia, we hope that disruption risk of COVID-19 will become a momentum for "embracing next normal" in the implementation of HSE in companies in Indonesia.

2.   RESEARCH METHOD

This study employed a cross-sectional study method with a random sampling survey technique involved workers from various sectors of companies in 34 provinces in Indonesia. The survey used online questionnaire and spread through social media applications such as Facebook, Instagram, WhatsApp, and Telegram randomly. This study uses primary data obtained from the survey by exploring workers' perceptions of HSE compliance in the company before and during the COVID-19 pandemic, both related to the utilization of PPE to minimize operational risk and disruption risk for COVID-19. Supporting data collected includes the risk level of the company, worker's job title, island/archipelago regions, the ownership of the HSE division, and the ownership of the HSE Management System (HSEMS) certificate in the company. Next, the researchers performed a parametric statistic tests to prove the hypothesis from the data collected using the one-way ANOVA and t-test with a confidence level of 95%. The results of the statistic test then interpreted and analyzed based on literature studies. The recommendations obtained from the survey were formulated into the SMC and

discussed through FGD with cross-sectoral safety experts from academicians, government, and business to get a priority order of health and safety aspects related to forces to improve safety atmosphere in Indonesia.

3. RESULTS AND DISCUSSIONS

3.1. Respondent Demographics

Based on the results of the survey, the amount of respondents obtained is 1,049 respondents. A screening carried out to eliminate the duplication of data and that the results become 1,027 respondents. Table 1 summarizes the demographics of the respondents based on the several categories.

Table 1. Recapitulation of respondents' demographics

No.	Category	Percentage	No.	Category	Percentage
1	Respondent's location			Supervisor	21,20%
	Sumatera Island	8,07%		Manager/general manager	17,35%
	Java Island	68,59%		> General manager	2,77%
	Bali-Nusa Tenggara Arch.	4,71%	4	Respondent's scope of work	
	Kalimantan Island	7,40%		HSE division	21,13%
	Sulawesi Island	8,84%		General division (other than HSE)	78,87%
	Maluku-Papua Archipelago	2,40%	5	Ownership of the HSE division in the company	
2	Risk level of the company			Yes	69,09%
	Low	40,60%		No	30,91%
	Medium	10,60%	6	Ownership of the HSEMS cert. in the company	
	High	48,80%		Yes	68,93%
3	Respondent's job title			No	31,07%
	Staff	58,67%			

For the category of respondent's location based on island/archipelago, that Java Island has the highest number of respondents, namely 68.59%. It is because Java Island is the center of Indonesia's economy. In 2019, around 59% of Indonesia's GDP was a contribution from Java Island [13]. The majority of respondents came from companies with a high-risk level, amounting to 48.80%, namely the corporate sector such as hospitals and medical services, power plants, construction industry, to manufacture company. Respondents are workers in companies with various job titles, ranging from staff to the above of general manager. The highest percentage is at the middle-low management level, namely staff and supervisors. Next is the respondent's scope of work that came from the HSE field for 21.13%. It resulted in 69.09% of the respondent's workplace already have a HSE division and 68.93% of the companies where the respondents worked already have a HSEMS certificate.

3.2. Distribution of Health and Safety Compliance

The main variable used in measuring change in the level of HSE implementation before and during the COVID-19 pandemic is HSE compliance. Before the COVID-19 pandemic, workers' HSE compliance identified from the use of standard PPEs such as safety shoes, safety helmets, and safety gloves. Whereas during this pandemic, other than the use of standard PPE, the compliance also be seen from adherence to COVID-19 health protocols such as washing hands with soap regularly, wearing masks to prevent the spread of COVID-19, and maintaining the distance between workers. The distribution of HSE compliance before and during the COVID-19 pandemic is presented in the table 2.

Table 2. Distribution and test of difference in HSE compliance levels in the company

Survey Results						
	Respondent's level of compliance					
Category	Very Obidient	Obidient	Quiet Obidient	Disobedient	Very Disobedient	Mean
Before the COVID-19 pandemic	10,81%	30,09%	36,71%*	19,28%	3,12%	3,26
During the COVID-19 pandemic	44,89%*	44,79%	8,76%	1,46%	0,10%	4,33
Delta	34,08% ↑	14,70% ↑	27,95% ↓	17,82% ↓	3,02% ↓	
Note:	*Modus					

Paired Samples t-Test with confidence level of 95%						
	Paired Differences					
Pair	Mean	Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Before-during the COVID-19 pandemic	-1,067	,981	,0306	-34,845	1026	,000

Based on the result above, there was an increase in the category of very obedient and obedient, and a decrease in the other categories. The highest increase occurred at the very obedient, namely 34.08%. The result of hypothesis testing using paired t-test carried out with the initial hypothesis that the level of HSE compliance before and during the COVID-19 pandemic has no significant difference with confidence level of 95%. The result shows that the Sig. (2-tailed) is less than 0.05 (error rate), so the initial hypothesis is rejected. It assumed that there is a significant difference between the levels of compliance in HSE implementation at various companies in Indonesia when the COVID-19 emerged. Before the COVID-19 pandemic, the majority respondents said they were quite obedient. During the COVID-19 pandemic, the result became very obedient. This indicates the workers are becoming more aware of the importance of implementing HSE during the COVID-19 pandemic occurred in Indonesia. This awareness triggered by the existence of COVID-19 disruption risk, which is an unforeseeable factor related to the risk at the company. The result of this study is in line with the research conducted by Cook, who succeeded in proving that the proper and correct use of PPEs could reduce the possibility of COVID-19 transmission in the workplace [14]. Thus, the existence of disruption risk makes workers more aware and obedient in implementing health and safety to minimize operational risk and reduce the risk of the possibility of contracting the disease.

3.3. Health and Safety Increase in Compliance Based on Respondent Category

The survey results are being analyzed further after being tested in the hypothesis testing using the one-way ANOVA and the independent t-test. The hypothesis test used the increase in HSE compliance in the company as the dependent variable and the respondent category as the independent variable. The ANOVA method used for data that had more than two samples, while the independent t-test for data that had two not-related samples. The results for ANOVA is shown in the table 3 and for independent t-test is in the table 4.

Table 3. Recapitulation of ANOVA test results for HSE compliance

No.	Respondent's Category	Sum of Square	df	Mean Square	F	Sig.
1	Respondent's location based on the island/archipelago*					
	Between groups	3,939	5	,790	,819	,536
	Within groups	982,401	1018	,965		
	Total	986,351	1023			
2	Risk level of company**					
	Between groups	2,862	2	1,431	1,487	,227
	Within groups	985,503	1024	,962		
	Total	988,364	1026			
3	Respondent's job title***					
	Between groups	6,954	4	1,739	1,790	,128
	Within groups	1014,730	1045	,971		
	Total	1021,685	1049			

Note of the samples group in the test:
*Sumatera Island, Java Island, Bali-Nusa Tenggara Archipelago, Kalimantan Island, Sulawesi Island, and Maluku-Papua Archipelago
**Low, medium, high
***staff, supervisor, manager/general manager, and above the general manager

In the ANOVA hypothesis test, the confidence level used was 95% with the initial hypothesis that there is no significant difference in the increase in HSE compliance between more than two samples tested. When the data has a Sig. value that is greater than the error level or 0.05, the initial hypothesis is accepted and vice versa. Table 3 shows that Sig. value is greater than 0.05 for all respondent's categories. It concluded that there is no significant difference in the increase in HSE compliance of the various companies surveyed based island/archipelago location, company risk level, and respondent's job title. Companies in the islands of Sumatra, Java, Bali-Nusa Tenggara, Kalimantan, Sulawesi, and Maluku-Papua Islands are aware that the COVID-19 pandemic can spread to all locations in Indonesia so that workers from various companies are motivated to improve the compliance in HSE implementation. Companies at any risk levels, such as low, medium, and high, are showed an increase in the implementation of HSE in the same margin because they are aware that the disruption risk they face during the COVID-19 pandemic can be risky for all workers in the company regardless of the level of risk in each industry. In normal conditions, usually HSE compliance only increasing for certain positions such as staff or supervisors. Those positions assigned to a work environment that is more dangerous than the managerial level, and according to Zacharatos et al, a hazardous work environment can affect workers' conditions so that the company proceeded to implement a more disciplined HSE [15]. However, the results of this study indicated that workers from low-middle management to top management level experienced an increase in compliance in HSE implementation during the COVID-19 pandemic. The results are in line with Donthu and Gustafsson, who stated that the risks caused by the pandemic disease are not only applied to certain positions, but any job title could receive various impacts [16].

Table 4. Recapitulation of independent t-test results for HSE compliance

Category	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Ownership of the HSE division							
Equal variances assumed	8,062	,005	3,700	851	,000	,306	,083
Equal variances not assumed			3,454	245,905	,001	,306	,089
Ownership of the HSE Management System certificate							
Equal variances assumed	21,387	,000	2,725	481	,007	,123	,045
Equal variances not assumed			2,679	364,028	,008	,123	,045

Note of the samples in the test: yes and no

The independent t-test used a 95% confidence level. The initial hypothesis is that there is no significant difference in the increase of HSE compliance in the two samples tested. In table 4, it presents the data based on the ownership of the HSE division and HSEMS certificate. In the third column, the Sig. value is smaller than 0.05. It shows that both data were not homogeneous. To find out the results of hypothesis testing, referred to the Sig. (2-tailed) or sixth column in the row of equal variances not assumed. Both data categories had a Sig. (2-tailed) below 0.05, so the initial hypothesis was rejected. It indicated that there is a significant difference in the increase of HSE compliance in companies that already have a HSE division or HSEMS certificate compared to companies that did not have any. Based on the survey results, it concluded that the average percentage of increase in HSE compliance in companies that already have a HSE division was only 25%, while in companies that did not have it was 32.66%. The average percentage of increase in HSE compliance in companies that have a HSEMS certificate was 24.45% and companies that did not have it was 33.23%. It proved that companies which did not have a HSE division or HSEMS certificate had an increase in HSE compliance during the COVID-19 pandemic better than companies that already have any. It is a positive finding because there is a phenomenon that during the COVID-19 pandemic, many companies are starting to realize the importance of the HSE division and HSEMS certification. The projected benefits of this finding are that the number of companies that have HSE division and HSEMS certificate is also estimated to increase. According to research by Umugwaneza, Nkechi, and Mugabe, companies that did not have proper HSE management could effect on decreasing the worker's productivity [17]. The increased of compliance in HSE implementation in companies that did not have a HSE division or HSEMS certificate during COVID-19 also explained that the company was trying to maintain the workers' productivity during a pandemic.

3.4. Health and Safety Recommendations

The existence of disruption risk of COVID-19, as an unforeseeable factor, concluded to be able to provide a positive benefit in the increase in HSE compliance. The shifting in the HSE implementation that occurred in companies in Indonesia indicates an increase in the safety atmosphere. It described by the application of health protocols and the proper use of COVID-19 PPEs in addition to the use of standard PPEs. Before the COVID-19 pandemic, companies tended to implement HSE stagnant or inconsistently. According to Jilcha, Kitaw, and Beshah, continuous improvement in the company (workplace innovation) in response to a challenge/problematic production process influences the HSE implementation [18]. Companies that carry out innovations will tend to be consistent in implementing HSE because they always make improvements to the work system. Meanwhile, companies without innovation will be more stagnant in implementing HSE. Recommendations for improvement on seven aspects of health and safety are needed to support the increase in safety atmosphere in the next normal in companies in Indonesia. Based on the survey results the priority order of health and safety aspects that need to be improved is the aspect of commitment with a percentage of 22.67% followed by responsibility for 19.78%, engagement & involvement namely 18.70%, leadership as much as 15.31%, competence for 10.84%, information & communication for 9.30%, and in the last priority is organizational learning with a percentage of 3.40%.

It could not be denied that the safety atmosphere in Indonesia is increasing due to the disruption risk of COVID-19. Although this disruption risk will decrease along with the discovery of the COVID-19 vaccine, there are several possible conditions for HSE compliance in the period of the next normal. The following figure is a brief illustration of the possibilities that will occur in the next normal.
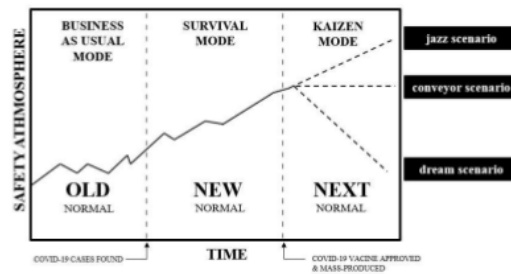
Figure 1. Scenarios of HSE implementation based on COVID-19 pandemic period

There are three possible scenarios for the safety atmosphere condition in the next normal, namely jazz scenario where the safety atmosphere continues to increase significantly, the conveyor scenario where the safety atmosphere is stay the same in the next normal, and the last is the dream scenario where the safety atmosphere is decrease significantly. It is necessary to formulate a general strategy to continuously improve the HSE implementation in various companies in Indonesia to pursue the jazz scenario. Several cross-sectoral safety experts from academicians, government, and businesses have conducted FGD with researchers to formulate general strategies then the results transformed into the Safety Model Canvas (SMC).

SMC is a template developed for safety engineers to formulate a strategy to increase the safety atmosphere regarding the existing conditions of each company. It used the same approach as the business model canvas framework of mind by mapping a condition within the company, which is written on a canvas to conceptualize the right business model for the company [19, 20]. SMC consists of seven building blocks, in this study is the same as the health and safety aspects, which can be the main aspects of improvement to increase the safety atmosphere in the next normal. The strategy formulation for SMC is based on perceived risk as an input and risk controlled as the output of the canvassing process. Each company has different characteristics that makes the canvassing process vary for each company. To carry out the canvassing process, it could refer to the priority aspects obtained from the results of field observations or assessments. The following figure shows the SMC formulated through FGD with safety experts by considering the priority aspects of health and safety in supporting the next normal, which becomes a stage or path in the formulation of improvement strategies at SMC. Generic recommendations to improve the safety atmosphere in Indonesia are designed with consideration to various input during surveys and based on the professional experience of the safety experts.

Figure 2. Safety Model Canvas for improvement recommendation of the safety atmosphere in next normal

The first aspect that need to be strengthened is commitment. It can be improved through reengineering the company's business model to implement health and safety as an integral part of the company's vision and mission. According to Baryram, strengthening HSE commitment in a company creates a positive effect on worker satisfaction and HSE implementation [21]. Thus, it is not surprising that commitment is the first priority aspect that needs to be improved on efforts to improve the safety atmosphere in Indonesia. The second priority, according to the results, is the aspect of responsibility that can be improved by increasing all employee responsibilities in all managerial lines. In previous references written by Kaynak *et al*, it stated that several large companies had not prioritize health and safety, even though the issue of HSE is a shared responsibility for everyone [22]. The third aspect is engagement & involvement, which can be improved by increasing the spirit of collaboration among all elements of the division in the company. This recommendation is supported by the research from Wachter and Yorio, that to reduce the level of work accidents, the cooperation between all parties and engagement between all workers is needed [23, 22]. The fourth priority based on the results of

the survey and FGD is the aspect of leadership that can be improved through efforts to strengthen the role of top management to provide a good example and supervise the implementation of HSE rules. According to Tappura, Syvänen, and Saarela and research conducted by Ndegwa *et al*, providing support and supervision can be done from top to low management to improve the safety atmosphere in the company [25, 24]. The fifth aspect is competence that can be improved through continuous and structured HSE training activities. Based on Bayram's research, efforts to increase competence through safety training can directly affect the performance of HSE implementation [26]. Next is the information & communication aspect, which can be improved through the development of a centralized HSE database. Best practices for implementing health and safety in several companies in Europe, according to Gerard *et al*, shows that a centralized HSE information & communication channel can facilitate access to information to pursue the better HSE in their companies [27]. The last aspect of the priority for improving safety atmosphere scale is organizational learning. It can be improved through the provision of facilities that make the sharing knowledge from the successful HSE implementation in the company. Through this aspect, according to Nathai-Balkissoon, companies can learn from experiences of success and mistakes and adapt and develop better health and safety methods [28].

3.5. Limitation

This study used an online questionnaire spread through social media applications. 1,027 respondents were obtained randomly and scattered from all over Indonesia. Nevertheless, this study has several limitations that should be understood. It was a cross-sectional study conducted online to explore workers' perceptions of HSE compliance at the beginning of the COVID-19 pandemic in Indonesia. There were no data could be obtained regarding accident rate and COVID-19 victims from each company surveyed. The data presented was self-reported depending on the respondents' honesty and objectivity to give feedback. This condition may result in information bias. Despite that, this study provided valuable information regarding the risk disruption presence toward HSE compliance and the strategy to maintain the safety atmosphere in the next normal.

4. CONCLUSION

The COVID-19 pandemic has impacted the world, including Indonesia. Generally, HSE implementation in various companies in Indonesia has been increasing in compliance between before and during the COVID-19 pandemic. It is proved from the results of the t-test statistic test. Whereas in HSE compliance related to the company location, company risk level, and worker's position level, based on the ANOVA statistic tests, there were no significant differences, means the increases that occurred in each category were on the same margin. Based on the t-test statistic test, there was a significant difference in which companies that did not have a HSE division or a HSEMS certificate experienced a higher increase than companies that already have any. This increase indicates that the safety atmosphere is increasing due to the disruption risk of the COVID-19 pandemic as an unforeseeable factor. It allowed several scenarios to occur in the next normal, where the ideal condition is the jazz scenario. Based on the survey data and FGD with cross-sectoral safety experts, the recommendation to maintain the safety atmosphere increasing is obtained by employed the SMC. The priority order of aspects that need to be improved starts from the commitment, responsibility, engagement & involvement, leadership, competence, information & communication, to organizational learning.

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