

## The Compliance Status of Chemical Management among Industries in Malaysia: The USECHH after 20 years

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### Abstract

Chemical management plays an important role in the protection of human health and environment. Malaysia through the Department of Occupational Safety and Health (DOSH) developed chemical related legislations under the Occupational Safety and Health Act (OSHA) 1994 upon tripartite and stakeholder consultation. Effective law enforcement by DOSH is important to ensure compliance to occupational health legislations in order to meet the objectives of OSHA 1994. This paper presents the status of chemical management compliance in Malaysia pertaining to compliance to the Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) (USECHH) Regulations 2000 among the industries in various economic sectors twenty years after its inception. This paper proposes four steps for investigating the compliance status. The four steps are overview of chemical legislations, enforcement strategies, data analysis and recommendations. There was a total of 9712 workplaces inspected by DOSH officers during the enforcement activities. About 54% workplaces received satisfactory grades while 46% were non satisfactory. USECHH operations for the last five years (2016-2020) revealed that 70% of the total workplaces inspected received satisfactory compliance while another 30% portrayed otherwise. These positive results show significant improvement in the status of compliance of chemical management as compared to the beginning of its introduction in year 2000 where majority of the grades are unsatisfactory. Analysis of each elements found that the worst compliance comes from elements such as medical surveillance, health surveillance, exposure monitoring and chemical health risk assessment. The research also prescribes strategies and methods taken by DOSH Malaysia in ensuring chemical management compliance at the workplace. This paper shows an insight of chemical management in Malaysia briefly and provides suggestions and recommendations, measures and outcomes of enforcement. Future measures to be taken by DOSH is also suggested to boost compliance.

Keywords: USECHH compliance, self-assessment, checklist, enforcement, punitive actions, chemical management, MyKKP.

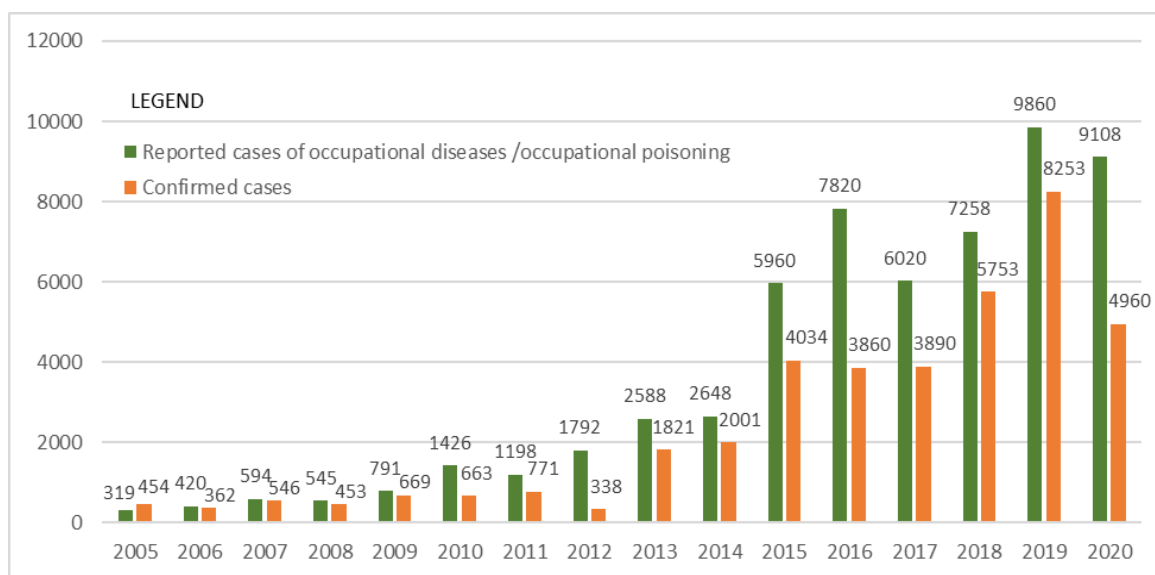
### 1.0 INTRODUCTION

Sound chemical management plays an important role in the implementation of sustainable development goals in terms of protection of human health and environment. Malaysia emphasizes on sound management of chemicals through promulgations of numerous chemical legislations, guidelines, industry code of practice, ratifications of various chemical conventions and through some international obligations since the introduction of the self-regulating act which is the Occupational Safety and Health Act (OSHA) in 1994. Malaysia through the Department of Occupational Safety and Health (DOSH) developed chemical related legislations under OSHA 1994 upon tripartite and stakeholder consultation. OSHA 1994 emphasises on sound management of chemicals through promulgations of four regulations, one prohibition order and one industry code of practice and fourteen guidelines related to chemicals. Effective law enforcement by DOSH is important to ensure compliance to these occupational health legislations to meet the objectives of OSHA 1994 or its amendment. The challenges faced by DOSH currently is compliance among the small and medium enterprises as compared to multinational companies.

Chemical management has been promoted by various international organisation globally. Examples of these organisations are the United Nation Environmental Programme (UNEP) through Strategic Approach to International Chemicals Management (SAICM), the International Labor Organization (ILO) through its various chemical conventions and the Asia-Pacific Economic Cooperation (APEC) Chemical Dialogue for regional cooperation on chemical management in the Asia-Pacific region (Ying W. et. al, 2016).

According to the ILO (ILO, 2020), over 20 million workers employed in the chemical industries. Improper use of chemicals can cause adverse health effects to its users. The ILO estimates that yearly there is around 2.3 million men and women around the world give way to work-related accidents and diseases; and these accidents and diseases increased annually (ILO, 2020).

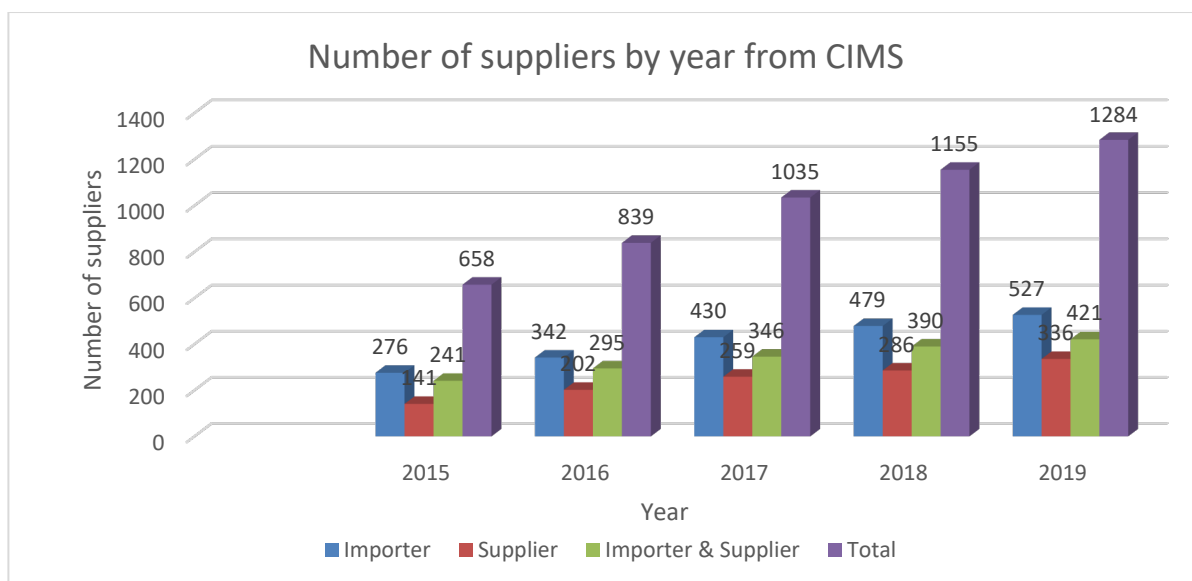
Statistics from the Social Security Organization (SOCSO) Malaysia indicated an increase in the number of occupational diseases associated with chemical exposures from 64 to 93 cases between the year 2016 and 2018. Occupational cancer in Malaysia also shows an increment of 200% from the year 2017 as compared to year 2018 while the increment in the number of respiratory diseases and skin diseases appeared to be insignificant between the same years (SOCSO, 2016-2018). Occupational poisoning figures from DOSH Malaysia indicated an increased figure from 26 to 141 between the year 2015 to 2018 (DOSH, 2021) while the total number of confirmed occupational diseases and occupational poisoning cases in Malaysia show an increasing trend from 2005 till 2019 as depicted in Figure 1 (BDAPP, DOSH Malaysia, 2021).



**Figure 1:** Statistic of Occupational Poisoning and Occupational Diseases from 2005-2020

Statistics from DOSH through Chemical Information Management System (CIMS) shows that the total quantity of chemicals in 2019 dropped by almost 50% from the total quantity of chemicals in 2018 i.e., from 602 million tonne to 297 million tonne (Chemical Management Division, 2019). However, the total number of accounts in the submission platform and the number of chemical suppliers in Malaysia show an increasing trend from 2015 to 2019 as shown in Figure 2. These data further emphasizes the influx of chemicals into Malaysia is dynamic and also largely depends on inventory submission from suppliers into the CIMS platform.

Due to the increasing number of occupational diseases, occupational poisoning, the increasing number of chemical suppliers and the large target audiences where chemicals usage covers in Malaysia, compliance status in chemical management is crucial to be determined. This is to anticipate whether current enforcement strategies adopted by DOSH is sufficient to minimize the risk of chemicals hazardous to health at workplace and whether each Malaysian workers are protected from the health risk of chemicals hazardous to health they are exposed to.



**Figure 2:** Total number of CIMS accounts submitted by chemical suppliers.

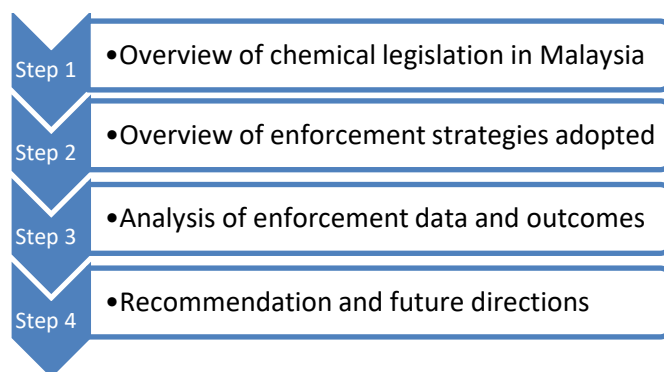
There are limited studies on chemical compliance using USECHH Regulations 2000 as a parameter to determine compliance level in Malaysia. Few studies among industrial chemical laboratories in Klang Valley and universities conducted revealed that training, awareness, knowledge and management commitment play a major role in the compliance status (Aznan, N., Jusoh, M., Zakaria, Z.Y., 2019).

This paper presents the status of chemical management compliance in Malaysia particularly pertaining to compliance to the USECHH regulations twenty years after its inception among the industries in various economic sectors. This research also prescribes strategies and methods taken by the law enforcement authority i.e. DOSH Malaysia in ensuring chemical management compliance at the workplace. Based on the research findings, this paper shows an insight of chemical management in Malaysia at a glance and provides suggestions, recommendations, measures and outcomes of enforcement. Future measures to be taken by DOSH is also suggested to boost compliance. At the same time, the outcomes and implications of this study on chemical management and chemical safety status in Malaysia can also be used as a reference to other developing countries in improving their chemical management.

## 2.0 MATERIALS AND METHODS

### 2.1 Aims and Objectives

The significance of this paper is to contribute an added knowledge to the occupational safety and health practitioners, DOSH officers, academia, the public at large and other developing countries about the status of chemical management compliance in Malaysia. The proposed methodology covers an overview of chemical legislations enforced by DOSH, overview of enforcement strategies adopted by DOSH, analysis of enforcement data and outcomes of enforcement from 2010 to 2020 for compliance with the USECHH Regulations 2000 and finally proposes future recommendations and suggestions based on the research findings as illustrated in Figure 3.



**Figure 3:** Steps of methodology of the study.

## **2.2 Step 1: Overview of chemical legislations in Malaysia enforced by DOSH**

Under this step, an overview of chemical legislations in Malaysia enforced by the authority who is enforcing occupational safety and health (OSH) in the country will be investigated. This step aims to probe into OSH law, regulations, guidelines or code of practices related to chemical management. Most of the data for this step are taken from the authority's official website and personal communications with the OSH officers. Since this study covers chemical management, only specific legislation pertaining to chemical management at the workplace will be explored.

## **2.3 Step 2: Overview of Enforcement Strategies Adopted**

This step aims to analyse the enforcement strategies adopted by the authority in charge of OSH to ensure compliance with specific chemical legislations identified in Step 1. The strategies adopted and their manuals are gathered from the interviews with OSH technical committees and from the published open accessed reports.

## **2.4 Step 3: Analysis of Enforcement Data and Outcomes**

Step 3 aims to explore further results of enforcement data compiled by the osh enforcement authority. Each element or each provisions of the USECHH Regulations with the highest compliance and the least compliance will be analysed using Microsoft Excel. Punitive and persuasive actions taken by the authority will be probed further.

## **2.5 Step 4: Recommendations and Future Directions**

Step 4 is the most important section of this study since it will critically discuss the findings from Step 1 to Step 3 and propose future recommendations to boost compliance of the regulations. Any limitation or challenges faced during the USECHH Regulations enforcement will be explored in this step.

## **3.0 RESULTS**

### **3.1 Overview of chemical legislations in Malaysia enforced by DOSH**

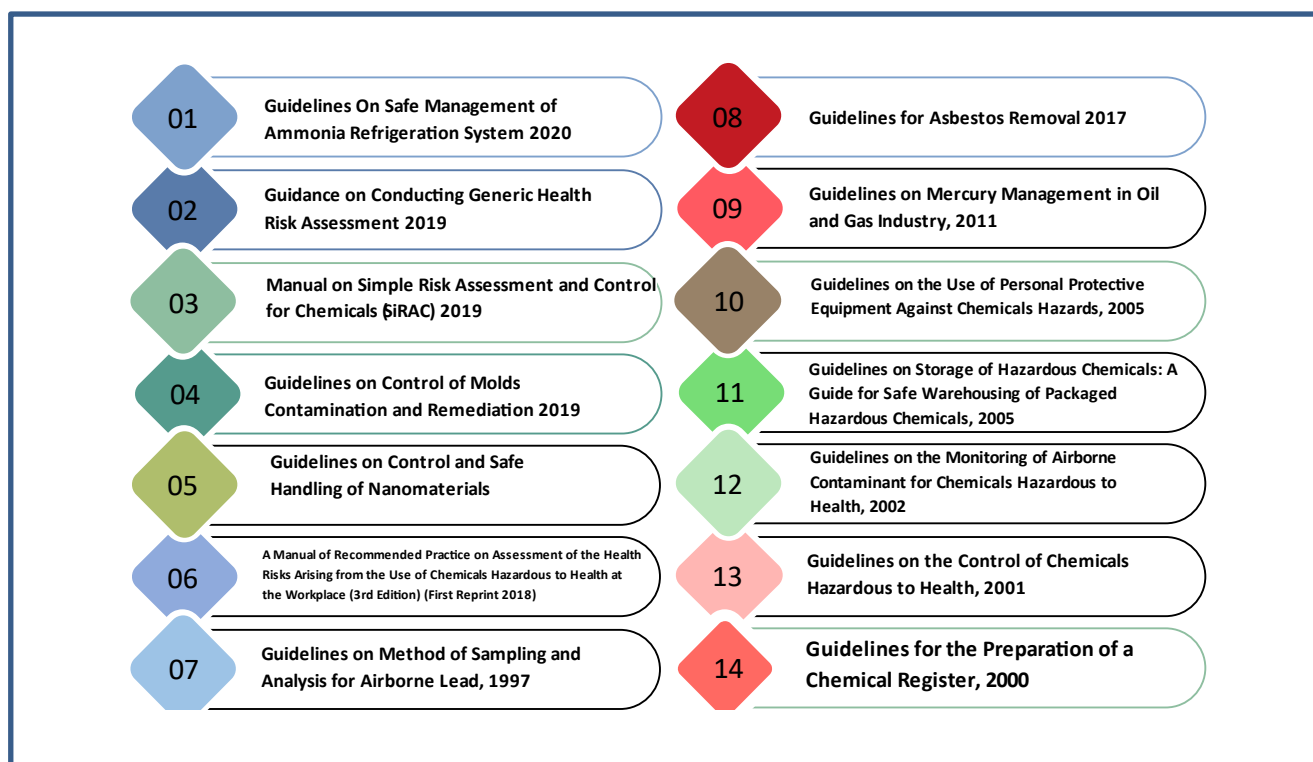
DOSH, formerly known as the Factories and Machinery Department is a department under the Ministry of Human Resources, responsible for ensuring the safety, health and welfare of people at work as well as protecting other people from the safety and health hazards arising from the activities of all economic sectors. DOSH is enforcing two acts pertaining to chemical management. They are the Factories and Machinery Act (FMA) 1967 and the OSHA 1994. Legislations related to chemical management under the FMA 1967 are:

- i. Factories and Machinery (Leads) Regulations 1984
- ii. Factories and Machinery (Asbestos) Regulations 1986
- iii. Factories and Machinery (Mineral Dust) Regulations 1989

In 1994, OSHA was gazetted and the name of the Factories and Machinery Department also changed to DOSH. Parallel with the international programmes or movements towards enhancement of chemical management at that time, chemical legislations in Malaysia were also enhanced and expanded by promulgations of new chemical legislations. The legislations are as the following:

- i. Occupational Safety and Health (Control of Industrial Major Accident Hazards) (CIMA) Regulations 1996
- ii. Occupational Safety and Health (Classification, Packaging and Labelling of Hazardous Chemicals) (CPL) Regulations 1997 (revoked in 2013)
- iii. Occupational Safety and Health (Prohibition of Use of Substances) Order 1999
- iv. Occupational Safety and Health (Use and Standards of Exposure of Chemicals Hazardous to Health) (USECHH) Regulations 2000
- v. Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) (CLASS) Regulations 2013
- vi. Industry Code of Practice (ICOP) on Chemicals Classification and Hazard Communication 2014

Many chemical related guidelines have been published by DOSH to assist industries in complying to these regulations (DOSH, 2022). The guidelines are illustrated in Figure 4.



**Figure 4:** Chemical related guidelines published by DOSH.

Only the provisions of the USECHH Regulations 2000 will be elaborated in detail since the scope of chemical management in this study is referred to as compliance with the USECHH Regulations 2000. However, the CLASS Regulations 2013 is also briefly explained.

The CLASS Regulations 2013 stipulates duties of chemical suppliers to provide sufficient information on hazards of chemicals that they supply, so as to mitigate the risk of accidents happening in the workplace, thus providing a safe and healthy working environment and condition. The responsibilities of suppliers as stated in the CLASS Regulations are to classify hazardous chemicals, label and prepare Safety Data Sheet of hazardous chemicals, to do proper packaging and to submit chemicals inventory to the authority. In this regulation, suppliers are defined as persons who supply hazardous chemicals, and include principal suppliers (that is, suppliers who formulate, manufacture, import, recycle or reformulate hazardous chemical chemicals) and subsidiary suppliers (that is, suppliers who repack, distribute or retail hazardous chemicals) (Department of Occupational Safety and Health, 2021). Breach of each provision of the regulation by a supplier is a crime and punishable with a fine of maximum ten thousand ringgit or to imprisonment for a term not exceeding one year or to both.

On the other hand, the USECHH Regulations was gazetted in 2000 to provide a legal framework to control exposure of chemical hazardous to health at the workplace, to set workplace exposure standard in order to protect the health of the employees and others at the place of work and to promote excellence in management chemicals hazardous to health at all workplaces in Malaysia. The regulations applies only to workplaces where chemicals hazardous to health are being used at the place of work. Chemicals hazardous to health are defined as those chemicals with Permissible Exposure Limits listed in Schedule I or II of the regulations, chemicals classified under health hazard of CLASS Regulations, pesticides under Pesticides Act 1974, and scheduled wastes under Scheduled Waste Regulations 2005.

However, certain places of work are excluded from application of USECHH Regulations if the chemical substances used are radioactive materials, foodstuff, pharmaceutical products, or they are hazardous to health solely by virtue of their explosive or flammable properties, or solely because they are at a high temperature or pressure. If chemical is not listed in schedule I or II but was classified as hazardous under CLASS Regulations, this chemical will be covered under USECHH Regulations if it is used at workplace. The main provisions under the USECHH regulations are compulsory duties of employers at the place of work. The duties of employers are the following:

- a. Identification of chemicals hazardous to health;
- b. Ensuring workers exposed to chemicals well below permissible exposure limits;
- c. Conducting assessment of risk to health;
- d. Take action to control exposure upon receiving the risk assessment report;

- e. Labelling and Relabelling
- f. Provide information, instruction and training
- g. Conduct monitoring of the exposure at the workplace
- h. Conduct health surveillance;
- i. Conduct medical removal protection
- j. Putting up warning Sign
- k. Record keeping

Breach of each the provisions of the USECHH Regulations 2000 warranted for a maximum penalty of ten thousand ringgit or to imprisonment for a term not exceeding one year or to both. The place of work governed by OSHA 1994 are all economic sectors as illustrated in Figure 5, while the term” used” at work covers the use of chemicals during all processes from cradle to grave in the production, processing, handling, transport, storage, disposal and treatment. The place of work not covered by OSHA 1994 are those workers working on board ships governed by the Merchant Shipping Ordinance 1952, and the Merchant Shipping Ordinance 1960 of Sabah or Sarawak and the armed forces (Department of Occupational Safety and Health, 2021).

ECONOMIC SECTORS
Manufacturing
Agriculture, forestry and fishing
Utilities - electricity, gas, water, and sanitary services
Hotels and restaurants
Finance, insurance, real estate and business services
Public services and statutory authorities
Transport, storage and communication
Wholesale and retail traders
Mining and quarrying
Construction

**Figure 5:** List of ten economics sectors which OSHA 1994 covers.

### 3.2 Overview of Enforcement Strategies Adopted

For the first time in history in 2001, DOSH was entrusted with the task of coming up with an effective strategy to enforce the newly gazetted USECHH Regulations. Industries were given a time frame of one year from the gazetted date to implement the main provisions highlighted in the regulation. There are two types of enforcement for the USECHH compliance. The first type of enforcement is called USECHH Routine enforcement while the second type is called USECHH Operation. Enforcement strategies for the first group of operation was based on the economics sectors of the highest risk from the SOCSO’s latest yearly report. Highest risk here refers to the highest number of accidents, or highest cases of occupational diseases or occupational poisonings (Personal Communications, 2021). For example, top three sectors of highest risk in Malaysia according to SOCSO’s report for 2002 are manufacturing, agriculture and construction. The enforcement strategy for USECHH Operation for that year would be based on those three sectors.

A committee comprising of DOSH representatives from three states such as Selangor, Wilayah Persekutuan, Negeri Sembilan and representatives from the Chemical Management Division is formed to discuss on the enforcement strategies for the nationwide operations. The dates are normally fixed within a range of two weeks to complete the operations. Operations are conducted twice a year while routine enforcements can be conducted throughout the year. Results of the nationwide operations need to be submitted to Chemical Management Division for analysis. Each DOSH state office is also expected to do her own state analysis.

Content of the enforcement strategy for USECHH Operations is outlined in Figure 6 and will be disseminated to all state offices by January each year. The enforcement kit contains USECHH checklist and list of notices to be issued for non compliance. These checklists will be analysed for USECHH compliance. The mechanism of operations and follow-up is illustrated in Figure 7 to emphasize that those poor gradings need to be enhanced to a better grading before year end. Follow up enforcements’ visits will be conducted to those workplaces of poor gradings. Subsequently, those with poor gradings will also be invited for engagement sessions to discuss on how to boost compliance.



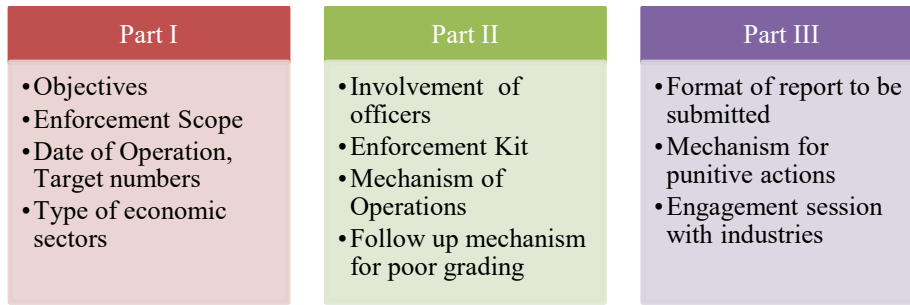


Figure 6: Content of the USECHH Operations Enforcement strategy

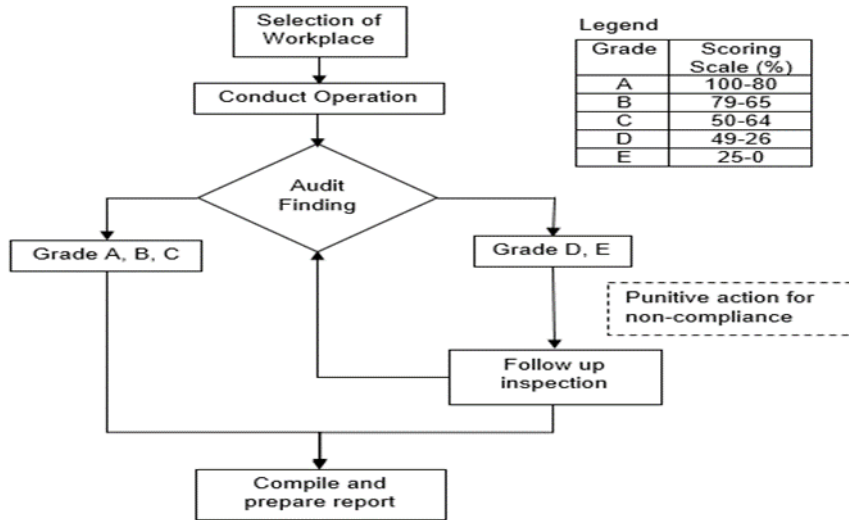


Figure 7: Mechanisms of USECHH Operations and Follow-up enforcement

Alternatively, the strategy for USECHH Routine enforcement, is based on the respective states directors' prerogative. In Malaysia, there are 15 DOSH state offices and different states would have different economic resources. Hence, the USECHH Routine enforcement's strategy varies from one state to another. The routine enforcement is done regularly throughout the year by DOSH officers from the Industrial Hygiene Section of each state and DOSH officers from the DOSH Headquarters. Figure 8 demonstrates the economic sectors selected for the USECHH Operations' enforcement strategy from the year 2016 till 2019.

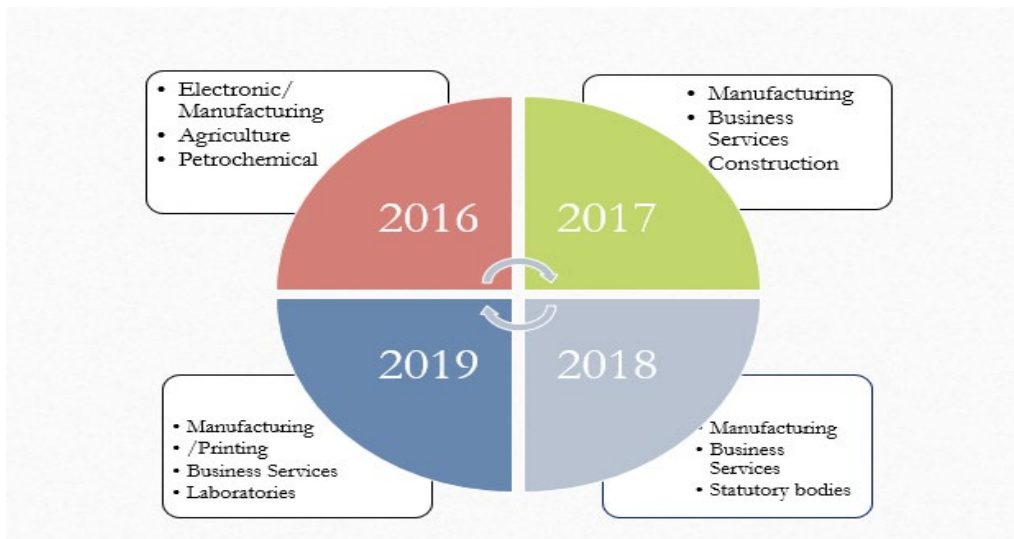


Figure 8: Economic sectors selected for USECHH Operations from 2016-2019.

For the subsequent year, the enforcement strategy for USECHH operations is normally initiated at the end of the year before the upcoming year. Postmortem of the previous operations will be carried out and will be considered for the next year enforcement strategy. Lessons learnt and feedback from the field enforcement will be scrutinized and integrated in the new upcoming strategy. From time to time, the strategy will be reviewed based on the highest risk economic sectors, other persistent factors and based on feedback from DOSH officers during their field enforcement.

However, in 2020, a new mechanism was introduced for those two types of USECHH enforcements due to the Movement Control Order (MCO) declared by the government. Self-assessment checklist was drafted and piloted by the OSH practitioners to test its reliability. This new innovation which comes with guidance notes for each element of USECHH provisions has been incorporated into the existing USECHH enforcement checklist. In April 2020, DOSH started to circulate this self-assessment checklist to the industries. Initially, selected industries were asked to fill up the self-assessment checklist and submit it upon completion with proof to the authority within stipulated time frame of two weeks to one month. Verification sampling is conducted upon receiving the results during the MCO by visiting the workplaces. This new norm checklist has been uploaded to the DOSH’s website for industries to use after few pilots testing for reliability.

### 3.3 Analysis of Enforcement Data and Outcomes

DOSH is currently using an online developed system named as MyKKP to provide online services to its clients such as registration and renewal of machineries, registration and renewal of competent persons, notification of accidents and also as data compilation for audits or enforcement activities conducted by DOSH (Department of Occupational Safety and Health, 2021). It is not feasible to gather USECHH enforcement data from 2001 till 2009 since this online system is only available in 2015. However, due to unforeseen circumstances, data entry for using the system was not made compulsory until April 2021. Hence, it should be expected that USECHH data gathered from MyKKP will not reflect the actual enforcement data.

For this study, data over the span of ten years from 2010 till 2020 was gathered from the Mykkp and yearly performance indicator by fifteen state offices throughout Malaysia. The compliance to USECHH 2000 regulation is graded by criteria such as A (100% - 80%), B (79 - 65%), C (64% - 50%), D (49% - 26%) and E (25% - 0%). During the MCO, USECHH enforcement activities are still conducted using the new innovation self-assessment checklist. Figure 9 shows the trend of grading obtained for the ten years enforcement of USECHH Regulations for both types of enforcements.

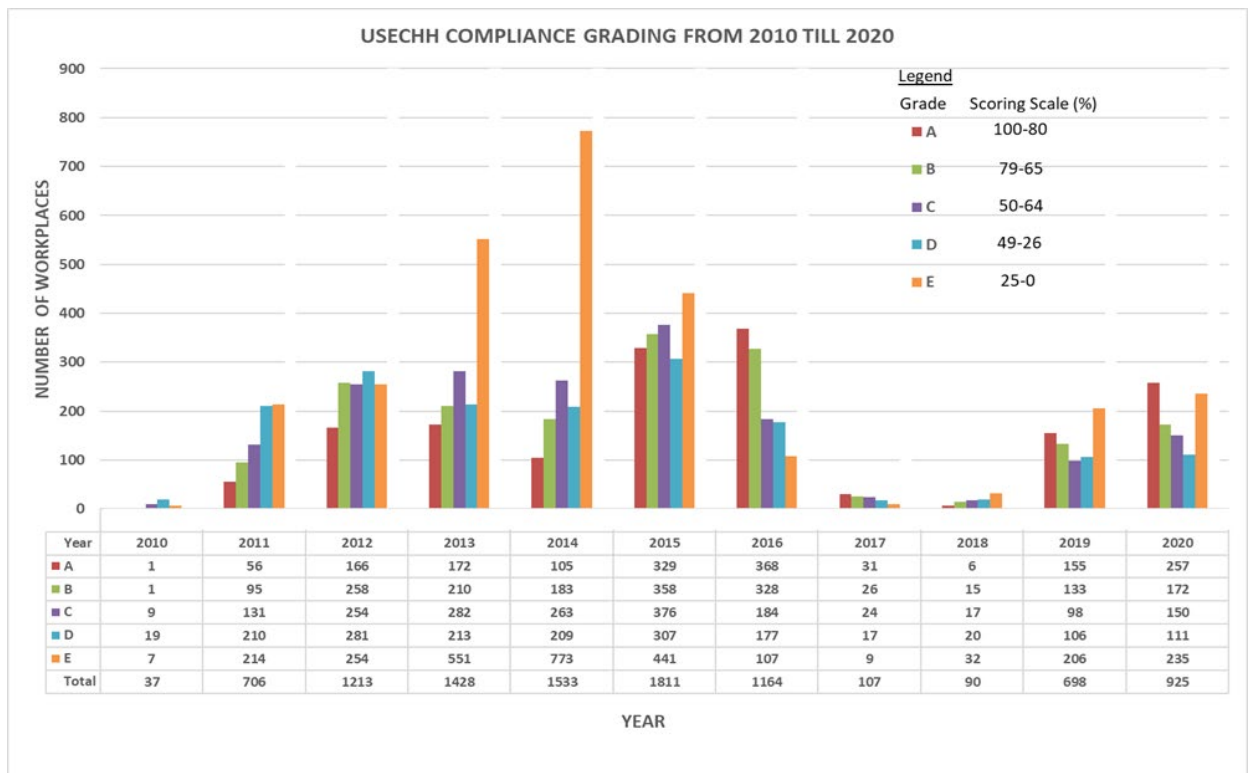


Figure 9: USECHH Compliance results from 2010 to 2020 for both types of enforcements- Data from MyKKP

Data from MYKKP shows that there was a total of 9712 workplaces inspected during USECHH enforcements from year 2010 to 2020 while 2530 out of 9712 workplaces were recorded for USECHH Operations from 2016 to 2020. The



compliance to the USECHH 2000 regulation is satisfactory if the workplace obtained at least grade C during the enforcement. About 54% workplaces were graded A to C and 46% were graded D to E during routine enforcement as tabulated in Table 1. These data is tabulated to emphasize the trend of grading.

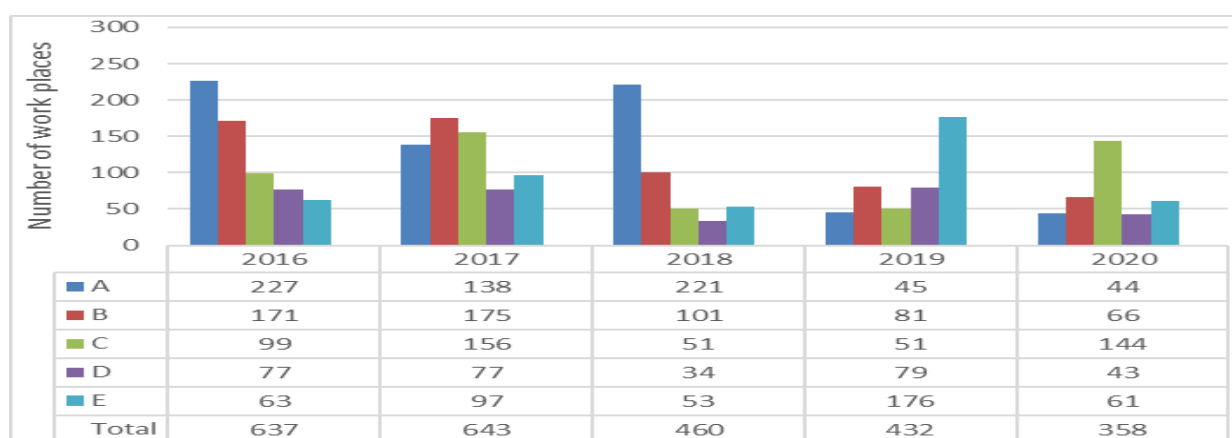
**Table 1:** Compliance versus number of workplaces audited for for both type of enforcements.

Year	Grade Satisfactory (A to C)	Grades Unsatisfactory (D and E)
2010	11	26
2011	282	424
2012	678	535
2013	664	764
2014	551	982
2015	1063	748
2016	880	284
2017	81	26
2018	38	52
2019	386	312
2020	579	346
Total	5213	4499

Source: MyKKP, DOSH

From Table 1, low compliance data was observed for the year 2010, 2017 and 2018. This could be due to lack of data entry into the MyKKP system since USECHH data entry into the system was only made compulsory in 2021. Data gathered for all USECHH operations prior to April 2021 was from manual submission from all state offices. Data gathered was then analysed and tabulated for yearly reports. For this study, USECHH Operations data for 2016 till 2020 will be discussed in detail.

Figure 10 shows data gathered manually from all states offices during USECHH Operations for a span of five years (Chemical Management Division, 2020). The data from Figure 10 are for USECHH Operations alone while the tabulated data in Table 1 are for both type of enforcements. On the other hand, Figure 11 shows percentage compliance of USECHH Operations from data gathered in 2016 till 2020 from various state offices. The total number of workplace varies by year depending on the number of workforce for enforcement as well as the current priorities at that time. Year 2020 marked a reduction in workplaces visited physically due to the MCO even though self-assessment checklists were distributed. Data in 2020 was gathered from self-assessment checklists filled and returned which have been verified by DOSH officers. Feedback from industries varies during the MCO; this could be due to shortage of manpower and closure of the industries.



**Figure 10:** Number of workplaces audited vs grades for USECHH Operations 2016-2020

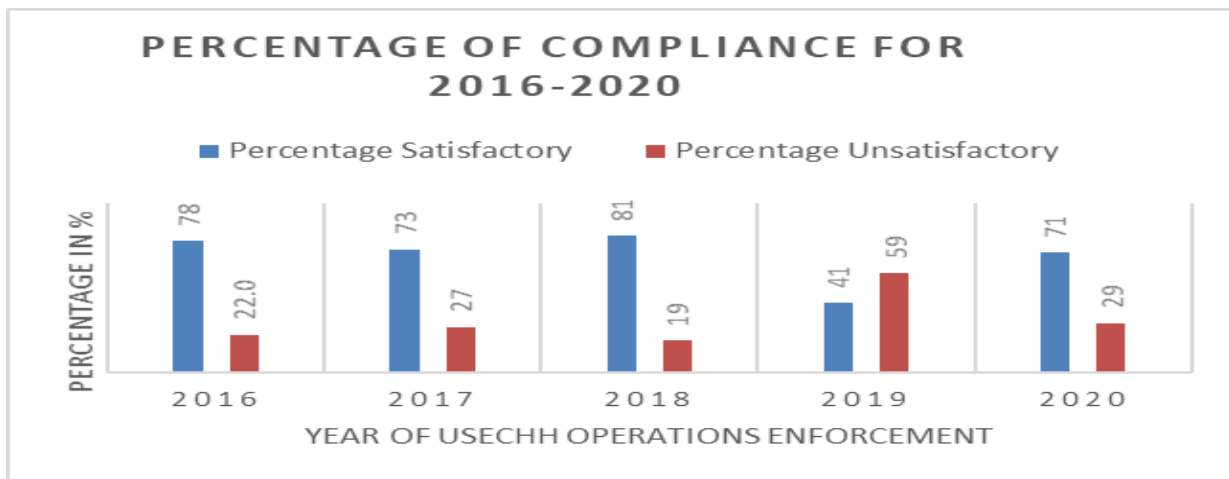


Figure 11: Percentage of Compliance from 2016-2020 for USECHH Operations

About 70% (1770) of the total workplaces inspected were graded A to C and 30 percent (760 workplaces) were graded D to E during the USECHH Operations enforcement from the year 2016 to 2020. Figure 11 shows that yearly average percentage of satisfactory compliance is higher than the percentage of unsatisfactory compliance over the span of five years. These results show significant improvement in the status of compliance of chemical management as compared to the beginning of its introduction in year 2000 where majority of the grades are unsatisfactory (Supoh, 2021).

Since each operation differed by sectors selected yearly, analysis by elements are done separately by sectors audited. For element analysis, data operation in 2019 was selected due to the repetitive sectors covered for this operation. Analysis of USECHH enforcement data specifies lack of compliance in the medical surveillance upon recommendations by chemical risk assessor. The results also show that noncompliance is common among the small and medium enterprises (SME). Analysis also show that elements which are commonly easier to comply are as depicted in Figure 12 and Figure 13. The elements are recordkeeping, labelling and relabelling, warning sign and training. The most difficult elements to comply by percentage are medical surveillance, health surveillance, exposure monitoring and chemical health risk assessment. It is found that chemical hazard identification via preparation of chemical register is lacking (47.7%) among these industries even though it is one of most important and the most inexpensive element to comply with. It can be emphasized that “information, instruction and training” element shows moderate results similar to preparation of chemical register. However, it incurs cost to employers as compared to preparation of chemical register.

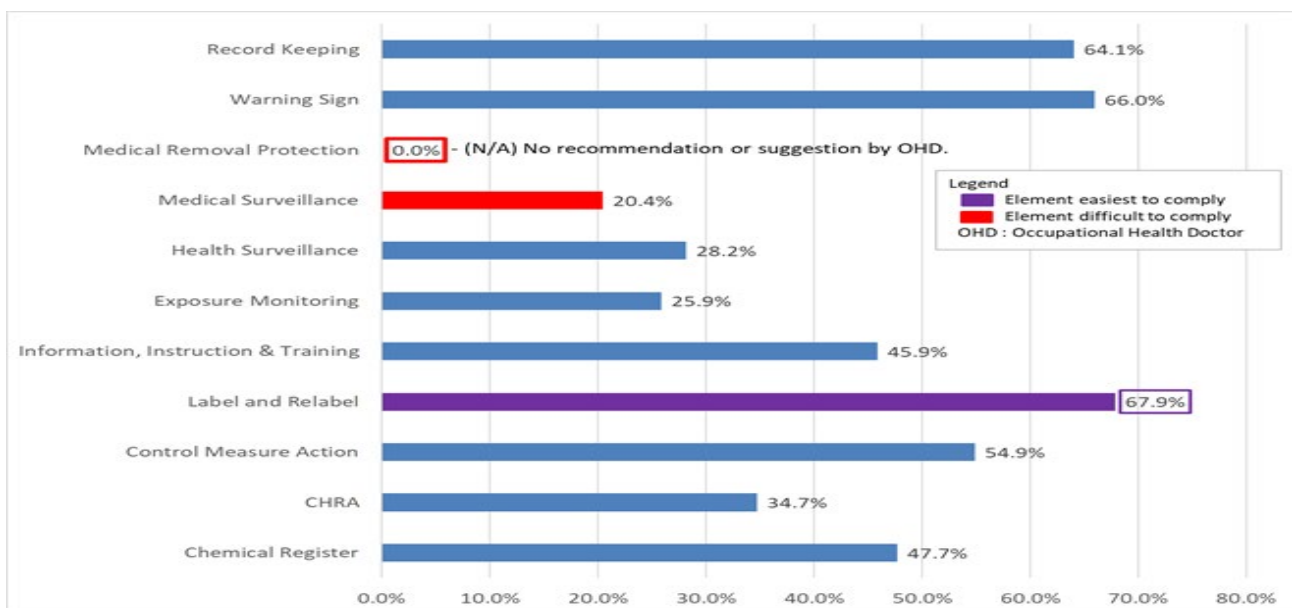


Figure 12: Analysis by element for overall USECHH Operation No. 2 in 2019 (for laboratories and service sectors)

It is envisaged that the four worst compliance in both Figure 12 and Figure 13 could possibly be due to the cost incurred to engage competent persons to conduct chemical health risk assessment (CHRA), medical surveillance, health surveillance and chemical exposure monitoring at the workplace upon receiving the CHRA report from the chemical risk assessor. It was expected that there should be an improvement in compliance for these two sectors i.e service sector and laboratories, since these were two repetitive sectors covered in 2015 and 2018. The four worst compliances remained the same in 2019.

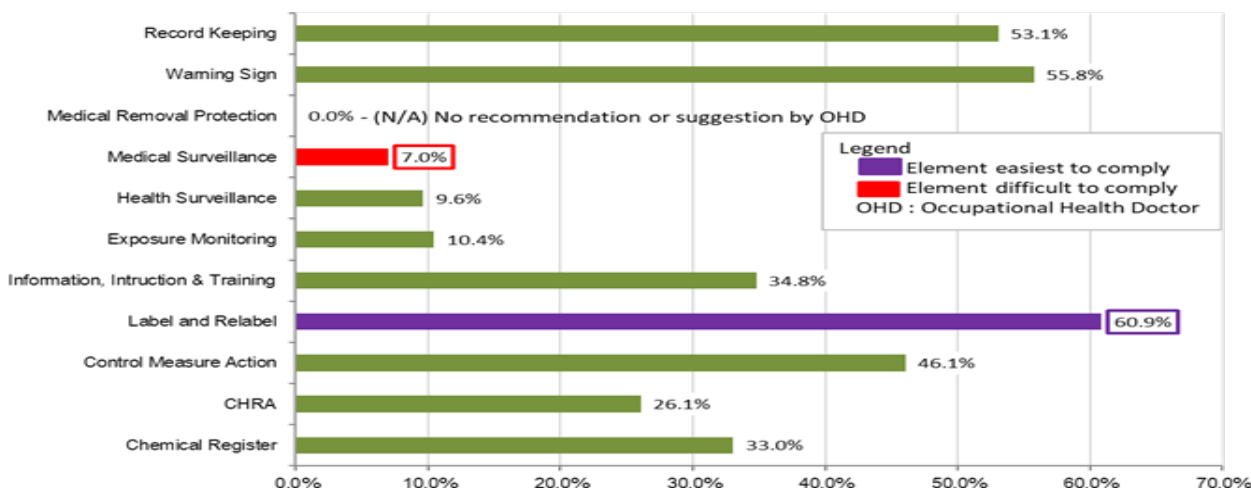


Figure 13: Analysis by element for USECHH Operation No. 2 in 2019 (service sector only)

### 3.4 Analysis of Punitive Actions Imposed on Organisations

In the strategies adopted by DOSH as outlined in Figure 6, punitive actions are imposed to those who breached any of the elements in the USECHH Regulations. Types of actions taken by DOSH for breaches of the USECHH Regulations provisions are issuance of instructions letters, issuance of improvement notices which need to be complied with within stipulated timeframe, issuance of prohibition notices and legal prosecution. It was found that most of the improvement notices issued were for failure to prepare chemical register and failure to perform CHRA at the workplace. The number of punitive actions taken during enforcement of USECHH Regulations shows an irregular trend as depicted in Table 2. Most numbers of punitive actions taken was in 2019 with 47 court cases. Table 3 reveals top ten worst compliance elements with the number of punitive actions issued during the USECHH Operations in 2019 (Chemical Management Division, 2019). A study on OSH Officers’ perception towards imposing punitive actions against errand employers in manufacturing settings in Malaysia revealed that OSH Officers were keen on imposing persuasive actions (issue directive letters, issue notices) rather than taking punitive actions (offering compounds and bring to court) (R. Hasan et. al, 2020).

Table 2: Number of punitive actions taken against USECHH enforcement year

Year	2015	2016	2017	2018	2019	2020
No of punitive actions	16	15	9	18	47	12

In Malaysia, for the manufacturing sector, SMEs are defined as firms with sales turnover not exceeding RM50 million or number of full-time employees not exceeding 200. For the services and other sectors, SMEs are defined as firms with sales turnover not exceeding RM20 million or number of full-time employees not exceeding 75 (SME Corporation, 2021).

Table 3: Top ten worst compliance elements with number of notices issued

Type of non compliance element	Number of Notices Issued	Percentage
Prepare chemical register	39	29%

CHRA	40	29.9%
Exposure Monitoring	6	4.5%
Warning sign	8	5.9%
Training	6	4.48%
Reassessment	3	2.24%
OSHA 1994	7	5.22%
Maintenance of Engineering Control Equipment	9	6.72%
Medical surveillance programme	3	2.24%
Others	32	9.7%
<b>Total</b>	<b>153</b>	<b>100%</b>

For USECHH Operation No. 2 in 2019, the number of workplaces audited was 197. Analysis of the size of industries involved in the 2019 operations revealed that satisfactory grades (A, B or C) are higher in percentage in industries which employ more than 400 workers while unsatisfactory grades (D or E) can be found mostly in industries having less than 40 workers as tabulated in Table 4 and as illustrated in pie charts in Figure 14.

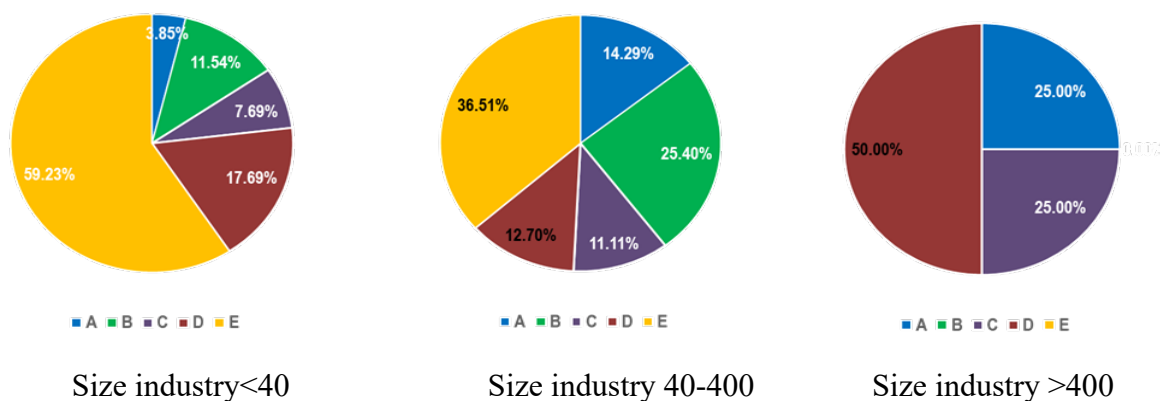


Figure 14: Pie charts of industry size and compliance.

Table 4: Size of industry versus Percentage Compliance for USECHH Operations No. 2 in 2019.

Percentage	Size of Industry	A	B	C	D	E
	<40	3.85%	11.54%	7.69%	17.69%	59.23%
40 - 400	14.29%	25.40%	11.11%	12.70%	36.51%	
>400	25.00%	0.00%	25.00%	50.00%	0.00%	

### 3.5 Analysis Of Activities Introduced By DOSH To Increase Compliance

Over the span of twenty years, DOSH enforcement strategies have undergone the twist and turns of changes in policies, new introduction of circular for noncompliance elements and the introduction of Enforcement Uniformity Model, innovative mechanisms, and tools such as guided checklist with infographic, promotional materials, and the introduction of smart digital technology through Industry Revolution 4.0 such as MyKKP in order to boost productivity growth in daily enforcement activities. Various methods of enforcement have been developed to cater for these changes. Method of enforcements implemented by DOSH are:

- a. Nationwide operations within stipulated timeframe, use of checklist which summarizes all the main USECHH provisions
- b. Focus on economic sectors of highest risk
- c. Engagement sessions with industries before and after operations
- d. Follow-up audits for those with unsatisfactory grades
- e. Issue instruction letters and notices (improvement or prohibition) for poor compliance
- f. Impose punitive actions on non-compliance or errand employers
- g. Self-assessment checklist with infographic and guidance notes introduced during MCO
- h. Use of online developed system i.e., MyKKP to capture all enforcement data starting from year 2015 and for monitoring of enforcement activities.

Repeat offenders are prosecuted or compounded while first timers would normally be given improvement notices or directive letters.

#### **4.0 DISCUSSIONS AND RECOMMENDATIONS**

The findings of this study for five years (2016-2020) from Figure 11 revealed that USECHH compliance during enforcements shows higher satisfactory grades (70%) than the unsatisfactory grades (30%). The compliance has transformed into a positive phase over the years since its first inception even though in 2019 unsatisfactory grades are higher. Both types of enforcements portrayed a slightly higher satisfactory compliance than the non satisfactory compliance as depicted in Table 1. Analysis of data from various operations of five years also depict similar trend. It is not feasible to actually compare the compliance trend yearly because the economic sectors selected for enforcement varies by states and by the risk priorities. However, comparing the gradings within each year shows that percentage of satisfactory grades are mostly higher than the unsatisfactory grades. Both results show significant improvement in the status of compliance with chemical management legislation in the country as compared to the beginning of its introduction in year 2000.

The USECHH Regulations require employer to assess the risks to health arising from chemical hazardous to health used at the workplace. Unfortunately, this is one of the worst least complied with by the industries. Without risk assessment, majority of the USECHH provisions could not be implemented at the workplace. Hazard identification is one of the first step in any chemical organisation. Chemicals hazards need to be identified and rated before any risk assessment can be conducted. This will eventually lead to unsatisfactory compliance status.

The mechanism and strategies of USECHH enforcements adopted by DOSH have been reviewed over the years and the follow-up visits seem to have an impact on the improvement of compliance. It was found that those industries issued with persuasive actions or punitive actions coupled with follow-up audits show an improvement in compliance. Data for 2020 is an indicator of enhanced compliance since enforcement in year 2020 only covered follow-up visits. From Table 2, it was found that punitive actions taken by DOSH is too small i.e., four percent (101/2530) if compared to the numbers of workplaces audited during the range of 2016 to 2020.

It was observed that the method of enforcement adopted by DOSH varies from the soft approach of having engagement sessions before and after each operation, guiding industries on documentations required before the enforcements during engagements down to taking persuasive actions and punitive actions against errand employers or organisations. Repeat offenders are found to be prosecuted or compounded while first timers were given improvement notices or directive letters. However, the percentage of punitive actions taken by DOSH is too small as compared to the number of workplaces audited. Research on OSH officers' perception that punitive actions are cumbersome which require expertise, knowledge and experience to open investigation papers to court confirmed this finding (Hasan, R, et. al, 2020).

Through enforcement activities among SMEs conducted by the DOSH, SMEs are found to be lacking in occupational safety and health (OSH) knowledge, lacking in financial support to implement OSH programmes as well as lack of proper coordination on OSH (DOSH, 2020). This is consistent with the findings of this study as illustrated in Figure 14. Unsatisfactory percentage is higher in companies with less than 400 workers. Hence, it is imperative for the tripartite organisations such as government, employers' associations and employees, to work together to assist SMEs.

With the online developed system available to capture all enforcement data, DOSH would be able to prepare data profiling for each economic sectors and workplaces. However, human intervention is still required to anticipate and plan for future changes in the system. The system might not be fully utilised as can be observed from the data prior to 2015 due to certain unforeseen circumstances and limited budget. Future direction introduced as in 2021 is for all OSH activities in the online system to be fully utilised and will be subsequently linked to department's key performance indicators.

Analysis by elements for enforcement data in 2019 found that the worst compliance comes from four provisions i.e. medical surveillance, health surveillance, exposure monitoring and chemical health risk assessment while the best compliance comes from recordkeeping, labelling and relabelling, warning sign and training. One common requirement for the four worst compliance provision (medical surveillance, health surveillance, exposure monitoring and chemical health risk assessment) is the activities need to be conducted by competent personnel appointed by the employer. Medical surveillance is conducted to monitor employees' health and the cost for each employee in the work unit assessed could be exorbitant. Chemical exposure monitoring is conducted to measure the airborne released chemicals which might cause health risk to the employees. Generally, an employee whose results of chemical monitoring equal or exceed Action Level of chemicals should be subjected to medical surveillance. These three worst compliance elements can only be done after the CHRA has been conducted.

A study on USECHH Compliance in laboratories (Aznan, N., Jusoh, M., Zakaria, Z.Y., 2019) discovered that there are seven critical success factors to ensure USECHH implementation at workplace. Some of the factors are commitment from the top management, strengthening roles and responsibilities of safety committee, establishment, and development of online system for information dissemination to ensure successful implementation of USECHH. These factors might assist industries of poor compliance especially the SMEs to boost their compliance at their workplaces.

## 5.0 CONCLUSION

The objective to investigate compliance level using USECHH Regulations 2000 as a parameter to determine compliance after twenty years of its inception in Malaysia through this research has been achieved. Both types of enforcement activities in the selected economic sectors audited by DOSH has shown an improvement in compliance over the years. Those workplaces graded as satisfactory are at slightly higher percentage than those graded as unsatisfactory. The developed online tool i.e. MyKKP for enforcement data compilation and storage has greatly assist DOSH in her monitoring enforcement activities. Data collected is useful for further profile studies and for improvement of enforcement strategies to boost compliance in chemical management throughout the country.

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