

## Review Article

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## Observance of Health Care Waste Management Performance Standards in Selected Hospitals

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### Introduction

Waste management must be given due priority to address the increase in the generation of hazardous waste, especially infectious waste to ensure the welfare of all users of health facilities. Climate Crisis is a Health Crisis. Our health leaders are continually challenged by the evolving issues and accelerating threats posed by health care waste. Health is everybody's business. Health systems only work when everyone works together to ensure that no one is left behind. It goes then without saying that this stern reminder extends to our responsibility in health care waste management. It is the responsibility of all hospitals and other health facilities, firstly, as providers of accessible, quality health care services, and secondly, as prudent and conscientious managers of the waste that comes from the service provision. We must treat waste management as the urgent and essential public service that it is. "Health Care Waste" (HCW) includes all the solid and liquid waste generated as a result of diagnosis, treatment, immunization of human beings, research, and production of biological products, among many others.

By its nature, health care waste is hazardous. A systematic and coordinated approach is paramount and essential in the management of such waste, which includes proper and safe segregation, collection, storage, treatment, and final disposal. Health care waste as properly managed means the immediate safety as well as the longer-term welfare of our communities. It can be further classified into sharps waste, infectious waste, pathological and anatomical waste, pharmaceutical waste, genotoxic waste, chemical waste, radioactive waste, and pressurized containers. On the other hand, the non-hazardous waste are general wastes that are recyclable, biodegradable, and residual. Segregation is the key to effective waste management and only implementation of proper waste management can ensure all HCWs will be treated according to the hazards. Segregation should be carried out by the producer of the waste as close as possible to its place of generation, which means segregation should take place in a medical area, at a bedside, in an operating theater or laboratory by nurses, physicians,

and technicians Health Care Waste Management (HCWM) must be given due priority to address the increase in the generation of hazardous waste, especially infectious waste related to COVID-19, as well as to ensure the welfare of all users of health facilities. An average of 12.86% monthly decrease, or almost 271 metric tons of general waste, had been observed in the DOH hospitals and an average of 25.22 % monthly increase or nearly 341 metric tons of Infectious waste generated [1]. Waste audits of the 5 pilot DOH hospitals in the Emergency Room, Dietary, ICU, and Medical Ward showed an average weight of 226 kg. of waste produced per day, amounting to 50% infectious and 75% plastic waste with 18% PPEs [2].

### Objectives of the Study

The study aims to describe the Health Care Waste Management (HCWM) practices and adherence to performance standards and to determine the overall compliance rate in hospitals. A cross-sectional study was conducted through the online medium from June 7 to 30, 2021, through the self-assessment survey tool.

With the generation of wastes in the hospital, it is necessary to provide a general description on the identification of Health Care Wastes (HCW) alongside its handling, waste storage before collection, treatment and proper disposal, a system to review their Operations Management and the Risk of the Current Waste Management System. Waste Segregation, On-Site Collection, Transport and Storage, On-Site Treatment, Administrative Policies, and Waste Minimization Practices, are the components that play a key role to determine adherence of Hospitals to the HCWM practices. Hospitals are then categorized to its ownership, service capability and location in order to determine and compare the overall compliance rate to the HCWM performance standards.

### Methodology

With the related studies on health care waste management presented earlier, the methodology of this study is a cross-sectional study design through the online medium that was maximized

to get the desired output and baseline data. Survey Research is the most fundamental tool for all quantitative outcome research methodologies and studies. The Health Facility Development Bureau of the DOH issued the Department Memorandum No. 2021-0271 last June 7, 2021, for the submission of accomplished HCWM self-assessment until June 30, 2021. Thus, this self-assessment tool was based on the annex checklist incorporated in the HCWM Manual 4th edition.

Based on the submission of the participating hospitals, we collated the data and came up with a Microsoft Excel database. In this, we are able to analyze the database by getting the frequency counts of the type of waste generated in hospitals, percentages of their compliance, and the median of each performance indicator through Mann-Whitney U to compare whether there is a difference in the ownership of hospitals and Kruskal-Wallis for comparing the service capacity and location per major island in hospitals.

### Analysis and Result of the Study

Health Care Waste (HCW) can be broadly categorized into “hazardous” and “non-hazardous” waste types. Hazardous HCW refers to waste that may pose a variety of environmental and health risks. It can be further classified into sharps waste, infectious waste, pathological and anatomical waste, pharmaceutical waste, genotoxic waste, chemical waste, radioactive waste, and pressurized containers. HCW is covered in the classification of hazardous wastes under the Department of Environment and Natural Resources Administrative Order 2013-22. The process of waste assessment provides an opportunity to improve current practices, sensitize health workers about waste, and determine the potential for waste minimization. Implementing rigorous segregation can avoid oversizing of equipment and result in cost savings.

The following data shows the generated waste storage before collection in hospitals, the general waste 45% use a secured storage area prior to disposing. For Sharps and pharmaceutical waste, 60% of hospitals use concrete vaults and puncture-proof containers. For pathological waste, 91% in the hospitals are using concrete vaults, sealed containers and storage area, thus it is noticeable that 7% of 56 hospitals store their pathological waste to the Material Recovery Facility (MRF) before disposal and 10% of the 30 hospitals used MRF for anatomical waste. Overall it shows that hospital HCWM practices are within the standards but, with proper waste minimization programs this practice is feasible.

For HCWM Treatment and Disposal, 53% are practicing both off-site and on-site waste disposal treatment, 32% of the hospitals have agreements with third-party treaters. While 15% or 8 hospitals only have the full capacity to treat their HCW. In terms of HCWM Disposal at the facility, more than 30% of hospitals do not practice to adopt concrete vaults as final disposal for sharp wastes, disinfection of placenta prior disposal and treats infectious waste and disposed through safe burial. This means that the disposal in a healthy facility needs more attention for proper intervention. For trained personnel for Operations Management of HCWM, there are 1277 personnel who have gone through the training, assigned to 63 hospitals. Even with this number, 7% or 4 hospitals do not conduct training for their personnel. Appropriate HCWM practices depend largely on the administration and organization also, and require adequate legislative and financial support, as well as active participation by trained and informed staff.

With the current HCW practices in hospitals, it shows that 71% of the health facility (HF) management have concerns about

HCW practices and 24% pose a health risk to patients and health care workers, and 34% said that it poses risk to the collectors. In addition, all waste coming from COVID wards and referral hospitals are considered infectious waste. The HCW generated within the Health Care Facility (HCF) follows an appropriate and well-identified stream from the point of generation until its final disposal, which is composed of several steps that includes: waste generation, segregation, collection, transportation (on-site and off-site), storage, treatment, and disposal.

Meanwhile, based on HCF’s adherence to HCWM Program particularly on the performance standards, the following results shows that in hospitals, Waste Minimization Practices are below 50%, the hospitals only reuse/recycle used containers and other materials, and are using environment-friendly products. The critical point in minimizing waste starts from the planning stage of the preparation of the Annual Procurement Plan (APP), which includes the list of items required for HCF activities. When looking at the waste segregation in hospitals, it shows that 23% or 15 hospitals do not practice proper segregation of waste in correct plastic liners. In addition, the use of puncture-resistant containers for sharps is observed with 100% compliance. Overall, it is noted that there is 92.30% compliance for this performance standard. All of the indicators in this performance standard includes waste on-site collection, transport, and storage are above 90% except for the janitorial service, which uses a standard trolley with an enclosure in collecting waste which is 82%.

For waste treatment on-site, the highly infectious waste and chemical disinfection is above 90% except for the validation test for waste treatment technology. Proper collection and transport of HCW is an important component in HCWM. Its implementation requires the commitment and cooperation of the HCF’s maintenance, housekeeping, and motor pool services’ personnel and all the HCF workers. HCW collection and transport practices shall be designed to achieve an efficient movement of waste from the point of generation to storage or treatment while minimizing the risk to the personnel.

In terms of hospital compliance with wastewater management, only 82% of 60 hospitals conduct regular testing of effluents, and 69% of 58 hospitals conduct preventive maintenance. As stipulated in the Philippine Clean Water Act of 2004, all HCFs must have their own wastewater treatment plant or must be connected to a municipal or common wastewater treatment facility or an equivalent system for small HCFs (with a bed capacity of 25 or less). In some cases, the HCF must provide a pretreatment to the wastewater prior to discharge to the municipal sewer.

For administrative control, all indicators of this performance standards show 90% above except for the posters and other IEC materials available on site, which is only 83% of the 65 hospitals. It also shows that there is a need for 100% support from the hospital management to have formal training and education of the personnel and infection prevention control protocol observed, especially during the time of pandemic. With all the performance indicators, only 2 Hospitals have excellent full compliance with the health care waste management performance standard.

Further, finding the median of each performance indicator through Mann-Whitney U shows significance whether the hospital is government or private. Thus, comparing the service capacity and location per major island in hospitals through Kruskal-Wallis showed no significance. In conclusion, overall compliance rates show that 87% or 56 out of 66 hospitals have a Satisfactory with Adequate Compliance rating.

## Recommendations

Aligned with the Health Care Waste Management practices, adherence to performance standards, and overall compliance rate in hospitals, the following are being recommended:

Improving waste minimization and segregation at source practices. Also, to have a written policy to establish the vision and mission of the implementation of the Waste Minimization Program (WMP) in hospitals since minimization practices are below 50%. the management of HF must adopt the following strategies to implement waste minimization:

- a. Establish an updated database for the waste generation rates, current hazardous waste management strategies, and current waste management costs;
- b. Institutionalize waste minimization and sustain the program in the long run;
- c. Have a written policy with an established vision and mission to implement the WMP;
- d. Be aware of their specific role in HCWM and be properly trained in waste minimization; and

In addition, for the government hospitals - to improve the HF's management in HCW, and must adopt the Green Procurement Policy (GPP) pursuant to Executive Order No. 301, Series of 2009; GPP contributes to the development objectives of the Philippines; it supports the enforcement of sector policies relevant for sustainable development for waste reduction, pollution and emission prevention others.

An average of 87.03% compliance rate in hospitals is observed for the performance standard on Waste On-Site Collection, Transportation and Storage. With this, a continuous improvement for the HCW collection and storage of all types of HCW in designated on-site storage areas until treated or transported, and on-site treatment of healthcare wastes through appropriate treatment methods to achieve an excellent and full compliance of hospitals.

Participatory learning and action module towards better implementation of HCWM standards. Since 7% of hospitals do not have proper training in HCWM, it is recommended for the development of training and e-learning modules for the HCWM Manual for hospitals specifically for Level 1 and Level 3 hospitals. Also, giving emphasis on the preventive maintenance schedule for wastewater management.

Strengthen the monitoring system and enhance the HCWM Self-Assessment Tool since there is a low submission rate in the hospitals. With this, we encourage all hospitals to submit their HCWM self-assessment tool in exchange for the printed copy of the HCWM Manual 4th edition while supplies last.

Health Care Waste Audit can be performed by an external auditor or by facility staff if staff have the expertise to do so. Waste audits can reveal the knowledge, attitude, and practices of the staff as well as information on actual occupational safety practices. This will help to enhance the current practices in hospitals as it is noted that there is a need for the management to remind the health care workers, patients, and carers. As the health sector reshapes our health care facilities to reduce their environmental footprint and participate in leading the national movement for environmental health and justice through the reduction of waste.

In line with Section 37 of the General Provisions of Republic

Act (RA) No. 11518, or the General Appropriations Act, Fiscal Year 2021, the Department of Health encourages investments in resilience and sustainability that promote greening of hospitals and health facilities, including the improvement of energy and water efficiency and conservation, sustainable cooling systems, and sustainable healthcare waste management in hospitals. (DOH DC 2021-0010). Also, the DOH will be releasing a Green and safe Health Care Facility Manual with one performance indicator being health care waste management. In this regard, capacity building of green building professionals on Green, Safe, and Resilient Health Facilities, to support the uptake of government health facilities of green building certification with the necessary learning and development interventions [3-10].

## References

1. Ruiz J P, Cruz G, Napulan R (2021) Sustainable Design Principles Development and Practices of DOH Hospitals Towards Climate-Smart Health Facility. *Academia Letters* 1222.
2. Department of Health (2020) Health Care Waste Management Manual, Fourth Edition, <https://bit.ly/HCWMmanual4thed>.
3. Department of Environment and Natural Resources (2013) Revised Procedures and Standards for the Management of Hazardous Waste (Revising DAO 2004-36).
4. Department of Health (2021) Incorporation of Disaster Risk Reduction and Climate Change Adaptation and Mitigation Measures in Health Facilities, DOH Department Circular 2021-0010.
5. Department of Health (2021) Submission of Accomplished Hospital Nursing Pharmacy, Finance, and Health Care Waste Management Services Manuals of Standards of Self Assessment Tools, DOH Department Memorandum 2021-0371.
6. Department of Health (2021) Green and Safe Health Facilities Manual, 1st Edition, <https://bit.ly/DOHGreenManual>.
7. Department of Health (2020) Philippine Health Facility Development Plan 2020-2040 [https://bit.ly/PHFDP2020\\_2040](https://bit.ly/PHFDP2020_2040).
8. Department of Health (2018) Revised Licensing Assessment Tools for Hospitals, DOH DC 2018-0131.
9. Republic Act 11518 (2021) Section 37 of the General Provisions of Republic Act (RA) No. 11518, or the General Appropriations Act, Fiscal Year 2021.
10. Ruiz JP (2022) Towards sustainable health facilities: Developing green, safe, and climate-resilient design principles and practices for DOH hospitals in the Philippines. *Journal of Sustainable Energy and Environment* 13: 69-73.

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