

CURRENT STATUS ON THE HEALTHCARE WASTE MANAGEMENT OF SELECTED HOSPITALS IN THE PHILIPPINES: AN ASSESSMENT

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Abstract

Healthcare waste management has been more critical during the outbreak of the Covid-19 pandemic. Healthcare waste (HCW) not only poses serious environmental and human health risks, but it can also cause death. The problem of how to manage HCW is extremely important to prevent widespread disease transmission and environmental degradation. A descriptive survey study assessing the implementation of the healthcare waste management on storage, pre-treatment, collection and disposal of all private and public hospitals in the Municipality of Camiling, Tarlac, Philippines was determined. A mixed method research was adopted by conducting semi-structured interviews with the Head of the Waste Management Division, Pollution Control Officers, Sanitary Inspector, and other employees involved in waste disposal in private and public hospitals, clinics, and rural health units. A survey was used as a quantitative tool for data collection from respondents involved in healthcare waste management. Data were gathered using questionnaires and interviews with respondents and key informants, respectively. Data were analyzed and interpreted using frequency count and percentage. Findings revealed that 80% of the respondents used a color coding scheme while 20% used labeling as means of waste segregation. It also showed that 60% of both private and public hospitals has conformed to the waste management standards set by the Department of Health (DOH), Republic Act 9003, and World Health Organization 2009. Moreover, a clinic has conformed only to the DOH standards in terms of segregation, pre-treatment, storage, and disposal of wastes generated. However, the rural healthcare unit used labeling in segregating its wastes instead of a color coding scheme. In addition, segregation of waste was done only in its T and B DOTS and Laboratory. Further, hospital wastes were mixed with municipal wastes and disposed of in a dumpsite. Treated hazardous and infectious wastes were disposed of using burial method. The system of handling, storage, treatment, and disposal of the hazardous wastes of the healthcare units was different from each other.

Keywords: Hospital waste, waste segregation, healthcare waste management, solid and hazardous waste, waste disposal and treatment

INTRODUCTION

The management of hospitals and healthcare units has the responsibility of ensuring that hospital wastes have no adverse health and environmental consequences in their handling, storage, treatment, and disposal. Improper management of healthcare waste aids in the transmission of diseases even the Covid-19 virus. Hospital wastes or biomedical wastes consist of solid, liquid, sharps, genotoxic, pharmaceutical, infectious, chemical, risk, and non-risk. and laboratory wastes that are potentially infectious and dangerous to health care, sanitation workers, patients who are regularly exposed to these wastes, the people who will also be exposed to it, and the environment (soil, air, water) when improperly handled (Das et al., 2021, Gassemi et al., 2016. Hossain et al., 2011, and Patwary et al., 2011, and Rao, 2008). These wastes have to be properly managed to protect public health otherwise they can pose serious risks of disease transmission to waste pickers, waste workers, patients, and the public in general upon exposure to infectious agents (Das, et al., 2021). Moreover, its causing disease is not only

the problem but if it contains hazardous wastes or radioactive wastes, it cannot be mixed with other non-hazardous solid wastes in the sanitary landfill. Proper waste management practices, safety measures for waste workers, and sanitation are crucial strategies for combating further spread of infectious diseases and landfill issues (Das et al., 2021).

On the other hand, not all hospital wastes are dangerous because there are wastes generated from its offices, cafeteria, and patient cares which does not pose a threat to landfills and public health.

With this environmental concern, government agencies such as DOH and DENR have set quality standards as well as regulations and programs so that occupational hazards of the health care workers will be avoided; the use of toxic chemicals and mixtures will be regulated; and solid and hazardous waste disposal will be managed from generation to final disposal.

The waste management programs of both public and private hospitals, clinics, and rural health units in Camiling Tarlac were determined to validate if they are conforming to the standard rules set by DOH in terms of waste management and the RA 9003 or the Ecological Solid Waste Management Act of 2000. Following the rules set indicates their ability and active responsiveness in ensuring the health and welfare of the community as well as performing their social responsibility in preserving the integrity of the environment. Some of the problems identified were mostly due to non – segregation processes, unsecured dumpsites, and landfill. Moreover, the poor implementation of some healthcare institutions regarding waste management systems was observed. This will most likely result in land degradation and a threat to human health.

On the other hand, some of the most common problems identified are inadequate waste management, lack of awareness about health hazards, insufficient financial and human resources, and poor control of waste disposal. To be able to minimize these consequences, proper implementation of rules and policies should be practiced by the management of hospitals and health care units. A framework for healthcare waste management should always consider health and occupational safety. Hence, this study on assessing the implementation of waste management in the healthcare sectors was conducted to determine the practices and conformity to ambient standards of public and private hospitals and other healthcare units in the Municipality of Camiling from generation, segregation, handling, storage, treatment, and disposal of their wastes. Moreover, the solid and hazardous wastes generated by the hospitals, clinics, and health care units were identified. The waste management programs implemented were described and further assessed on their level of conformity to the guidelines set out by the Department of Health.

The data generated from this study can be used for policy formulation of the Local Government Unit in reviewing the prevailing policies, mechanisms, programs, and facilities on segregating, storing, handling, disposing, and treating hazardous and infectious hospital wastes. Findings can also provide salient information to the local concerned authority to identify numerous issues in healthcare waste management and find opportunities to devise systems and the best solution to each.

METHODS AND PROCEDURES

This study was carried out in a descriptive survey research design to describe the waste management practices of the premier health care units in Camiling, Tarlac, Philippines. The Head of the Waste Management Division, Pollution Control Officers, Sanitary Inspector, and other employees involved in the waste disposal of 2 private hospitals, 1 private clinic, and 1 rural health unit. To protect the reputation of these premiere healthcare providers and ensure the confidentiality of the information divulged to the researchers, the identity name was not mentioned throughout the discussion. Instead, an alternative nomenclature was used namely: Private hospitals 1 and 2, public hospital, clinic, and health center.

Questionnaires were used to determine the waste management disposal practices of the private and public hospitals, clinics, and health care units while structured interview guides for the key informants to triangulate the information provided by the respondents. The premier private and public hospitals and health care units in Camiling, Tarlac were identified. Permission to administer the questionnaires and conduct interviews with employees involved in healthcare waste management from the Heads and/or owners of the healthcare units was secured. The questionnaire was given to each of the personnel of the said institution and they were further interviewed to validate the data gathered. The gathered data were analyzed through the use of quantitative analysis. The quantitative data were tabulated and analyzed using descriptive statistics such as frequency counts, mean, and percentages.

RESULTS AND DISCUSSION

Solid Infectious and Hazardous Hospital Wastes

Data on the healthcare solid and hazardous wastes generated by the hospitals and other health care providers in Camiling, Tarlac are shown in Table 1.

Table 1: Summary of solid infectious and hazardous wastes generated by the hospitals and health care units

Hospitals and Health Care Units	Solid Wastes Generated	Infectious or Hazardous Wastes Generated
Clinic	<ul style="list-style-type: none"> • Papers • Cartons • Plastics • Cans • Styropor containers 	<ul style="list-style-type: none"> • Sharps • Blood • Chemical waste from the laboratory • Cotton swabs • Used facemasks • Used bandages • Used tubing IV • Specimen container of blood and fluids
Public Health Unit	<ul style="list-style-type: none"> • Glass • Slides • Papers • Cartoons • Used cans • Styropor 	<ul style="list-style-type: none"> • Used syringes • Blood • Urinals • Blood lancets • Phlegm • Cotton swabs • Facemasks
Private hospital 1	<ul style="list-style-type: none"> • Empty medical bottles • Empty tetra pack containers • IVF container • Plastics, can, soft drinks, straws, wrapper, styropor containers • Waste from the offices 	<ul style="list-style-type: none"> • Disposal materials • Used for collection of body fluid • Dressing bandages • Used folly catheters • Used cotton falls • Used gloves • Used facemasks
Private hospital 2	<ul style="list-style-type: none"> • Waste from the offices- paper, cans, cartoon styropor containers 	<ul style="list-style-type: none"> • Empty vials • Sharps • Needles • Used gloves • Used cotton, pharmaceutical waste • Facemask • Radioactive waste
Public hospital	<ul style="list-style-type: none"> • Paper products • bottles • Packaging materials • Waste from offices 	<ul style="list-style-type: none"> • Pharmaceutical waste • pathological waste • radioactive waste • sharps • chemical waste • used foley catheters • used blood product bags or tubing • used gloves • specimen container of blood and fluids • used suction tubes • cotton applicator soaked with blood • body fluids from dressing of infected wound and post operative cases • waste from isolation room • Facemask

Table 1 shows that the solid wastes in the three hospitals, one public healthcare center, and one clinic are mostly similar. Most solid wastes were generated from their offices. Hazardous wastes on the other hand are mostly similar among the healthcare providers except for the presence of radioactive wastes in private hospital 2 and public hospital. Its presence can be attributed to the great number of patients either as out-patients or in-patients in these two hospitals. Many patients may mean different medical cases that will be needing low-level to high-level radioactive wastes. The influx of patients in public hospital is high due to cheaper medical expenses. However, premier private hospitals are also preferred due to the availability of comfortable facilities, sensitive and state-of-the-art diagnostic tests, and updated and advanced medical equipment (Al-Balushi et al., 2017 Meddedu et al., 2020).

In the Philippines, the Department of Health has set a standard color coding scheme for the disposal of healthcare waste. This coding scheme will be used in the health care facility as follows: Black for non-infectious dry waste, Green for non-infectious wet waste, Yellow for infectious and pathological waste, Yellow with Black Band for chemical waste including heavy metals, Orange for radioactive waste, and red for sharps and pressurized containers (Joson, 2012). The use of a color coding scheme as means to segregate hospital wastes is depicted in the table below.

Table 2: The use of color coding as a means of waste segregation of the health care units in the Municipality of Camiling

Use color coding scheme for waste segregation	Frequency (n=5)	Percentage (%)
Yes	4	80
No	1	20

Table 2 shows that the majority (80%) of the respondents were using a color coding scheme for waste segregation. These are private hospitals 1 and 2, public hospital, and clinic. However, 20% (Health Care Center) was using labeling instead of the color coding scheme in waste segregation. This color coding of the containers of the hospital wastes was set by DOH that is aligned with the UNEP/WHO 2009).

The conformity of these health care units to the standard rules set by DOH and according to RA 9003 is shown in Table 3.

Table 3: Summary of color coding scheme as means of waste segregation of the Hospitals and Healthcare Units in compliance to the Department of Health and RA 9003

Color Code	DOH Standards		Hospitals and Health Care Units				
			Clinic	Public Health Center	Private Hospital 1	Private Hospital 2	Public Hospital
For non-infectious dry waste or biodegradable waste							
Black	✓		✓	---	✓	✓	✓
Green							
Yellow							
For noninfectious wet waste or non-biodegradable waste							
Black				---			
Green	✓		✓		✓	✓	✓
Red							
For infectious waste and pathological waste							
Green							
Yellow	✓		✓	x	✓	✓	✓
Blue							
For chemical waste including those with heavy metal							
Yellow with black band	✓		x	x	x	✓	✓
Red							
Green							
For radioactive waste							
Green							
Black							
Orange	✓		x	x	✓	✓	✓
For sharps and pressurized container							
Red (puncture proof container)	✓		✓	x	✓	✓	✓
Yellow							
Black							

The result in Table 3 reveals that 80% of the health care units were using black color coding in segregating their non-infectious dry solid wastes or biodegradable wastes; green for non-infectious wet solid waste or non-biodegradable wastes; and yellow for infectious and pathological wastes. The public health center is the only unit that did not use color coding. However, in terms of segregating chemical waste including heavy metals, 60% (Private Hospital 2 and Public Hospital) were using black bands as indicators. For segregating radioactive wastes, 60% (Private Hospitals 1& 2 and Public Hospital) were using the orange indicator while 80% of the healthcare providers were using red puncture-proof containers.

The color coding scheme was set by DOH. Results show that 80% have conformed to DOH standards and RA 9003 in using a color coding scheme in segregating hospital infectious and non-infectious wastes. Only 20% had not used such a scheme because according to them, labeling is their means of waste segregation.

The provision of using a black band for chemical waste with heavy metals has not been followed by Private Hospital 2 and the Clinic (40%) because according to them they have not

used heavy metals in their hospital/clinic. The provision for segregating wastes with radionuclides was not also followed by Dr. John Iglesia Clinic due to the non-usage of such chemicals

Segregation

Table 4: Segregation system of hospital wastes of the five healthcare Units in Camiling, Tarlac

Health Care Units (Hospitals, Health Center and Clinic)	Waste Segregation System
Public Hospital	– The hospital was implementing RA 9003 in full and was using color coding
Private Hospital 1	– The hospital was implementing RA 9003 in full and was using color coding
Private Hospital 2	– The hospital was implementing RA 9003 in full and was using color coding
Public Healthcare Center	<ul style="list-style-type: none"> – The center was implementing RA 9003 in full and was using labeling instead of color coding – Only Laboratory and the T and B DOTS sections were observing waste segregation – Infectious and non-infectious wastes were separated
Clinic	– The clinic was implementing RA 9003 in full and was using color coding

Data in Table 4 reveals how the 5 healthcare units segregate their wastes. All units except the Public Healthcare Center exercised full implementation of RA 9003 or known as the Ecological Solid Waste Management Act of 2000 and adhered to DOH standards in waste segregation.

Segregation of hospital wastes in Public Hospital is done by separating the different types of wastes and placed in corresponding bins. Containers are properly marked as compostable waste, non-compostable table waste, infectious waste, chemical waste, pharmaceutical waste, pathological waste, radioactive waste, sharp waste and pressurized waste.

The Private Hospitals 1 and 2 have the same way of segregating their wastes through color coding scheme. The black container is for non-infectious dry waste, green bag is for non-infectious wet waste, yellow bag is for infectious and pathological waste, orange container is for radioactive waste and red container is for the sharps and pressurized container. The green plastic lined bin is for the biodegradable waste which includes empty cartoons, empty medicine boxes, and kitchen waste, left over foods, newspapers, papers, and vegetable peelings and fruit skins. Black plastic lined bin is for inorganic waste. Each room has different containers for the various kinds of waste. The segregation of waste done at the Salvador General Hospital is in compliance to the DOH standards and RA 9003.

The Public Health Center did not fully implement waste segregation. The laboratory room and the T and B DOTS are the only rooms that implement waste segregation. Waste segregation was through the labeling of the trash can. The infectious waste and general waste were separated.

Segregation of wastes in the Clinic is done through a color coding scheme. The color yellow container is for infectious waste, the black container was for non-infectious dry waste or inorganic waste, the red container is for sharp waste and the green container is for biodegradable waste. Each room has its trash can. The Clinic adhered the RA 9003. The institution used it as their guide in segregating waste.

Storage

On-site storage is the beginning of waste disposal because unkept waste or simple dumps are sources of nuisance, flies, smells, and other hazards (Takele, 2009). Infectious and pathological wastes however need to be treated while storing them before disposing of it properly.

Table 5: Storage of hospital wastes of the five health care units in Camiling, Tarlac

Health Care Units (Hospitals, Health Center and Clinic)	Storage System
Public Hospital	– Had Health Care Waste Management System (HCWMS)
Private Hospital 1	– Had Material Recovery Facility (MRF) for solid wastes – Solid wastes were stored for not more than 2 days
Private Hospital 2	– Had Material Recovery Facility for solid waste – Had concrete vault for temporarily storing hazardous and infectious wastes
Public Healthcare Center	– Stored infectious wastes in the drum for 1 year before disposal – Pre-treated hazardous and infectious wastes while reused and recycled solid wastes
Dr. John Iglesia Clinic	– Stored solid wastes for not more than 2 days and collected by Municipal truck every Tuesday – Available and visible waste containers

Table 5 shows that Public Hospital followed the Health Care Waste Management System (HCWM) of their institution. This is a systematic activity of the administration that provides policy on segregation at source, transport, storage, transfer, processing, treatment, and disposal of health care waste that does not harm the environment. This system is also in compliance with the DOH Standards.

Private Hospital 1 had its own Material Recovery Facility (MRF) which they use to temporarily store their waste – residual, recyclables and treated infectious waste. The wastes were stored

for not more than 2 days before disposing to the dump site.

Private Hospital 2 had its own Material Recovery Facility which they use to temporarily store their waste for the proper segregation and inspection of solid waste. They also use concrete vaults to momentarily store the treated hazardous and infectious waste for the security of the people and the environment before finally disposing of it in San Clemente, Tarlac.

The infectious or hazardous wastes generated by Public Healthcare Center are stored in a big drum. These wastes underwent pre-treatment before storing. It takes a year before the drum is buried in Camiling cemetery. The drum should be full before they bury it.

Pre-treatment

Table 6: Pre-treatment of hospital wastes of the five healthcare Units in Camiling, Tarlac

Health Care Units (Hospitals, Health Center and Clinic)	Pre-treatment System
Public Hospital	– The hospital was using autoclaving machine to disinfect infectious and hazardous wastes
Private Hospital 1	– The hospital was using antiseptic reagents for infectious and hazardous wastes and soaked before burying – The hospital was using septic tanks for infectious wastes
Private Hospital 2	– The hospital was storing pathological wastes in a secured bottle and was using formalin to preserve it before placing it in concrete vault – The hospital was using Lysol to disinfect hazardous wastes – The hospital was using needle burner for needle and syringes
Public Healthcare Center	– The center was using safety box for used syringe before disposal to drums – The center was using chlorine to disinfect
Clinic	– The clinic had no pre-treatment system

Table 6 reveals that the Public Hospital pre-treated its infectious and hazardous wastes through autoclaving the infectious wastes.

The Private Hospital 1 however was using Chlorox and Syndex for the pre-treatment of infectious and hazardous wastes. These are soaked for 1 week before they bury it. They also were using autoclaves to disinfect the containers of these wastes before disposing of them. The laboratory room has a septic tank for hazardous and infectious waste. A needle destroyer is used before disposing of the syringes and needles. The pathological wastes of Private Hospital 2 are stored in a secured bottle with formalin to preserve them before they are put in a concrete vault and finally bury it. Infectious and hazardous wastes undergo different treatment processes

before disposal. In disposing of blood and other pathological waste, they often use Lysol to disinfect or lessen and kill harmful bacteria while sharps like needles are burned in the needle burner. The Public Healthcare Center uses a safety box for the syringes which were chlorinated before disposing it to drum. All other infectious and hazardous wastes were pre-treated with chlorine before disposing of them. The clinic on the other hand had no pre-treatment system for its hazardous and infectious wastes.

Collection and Disposal

Collection is the removal of refuse from collection points to the final disposal site. It is the most expensive as compared with other operation and management procedures, because it demands special vehicles, experienced people to manage, more manpower, hand tools, and more funds for fuel, salary, maintenance, gathering or picking up of solid waste from the various sources, taking the collected wastes to the location where it is emptied, and unloading of the collection vehicle (Takele, 2009).

Table 7: Collection and disposal of hospital wastes of the five health care units in Camiling, Tarlac

Health Care Units (Hospitals, Health Center and Clinic)	Collection and Disposal System
Public Hospital	<ul style="list-style-type: none"> – Solid wastes were collected daily – Waste bags were labeled – Residual wastes were hauled using PEO dump truck in landfills at Matubog dumpsite – Infectious and hazardous wastes were transported using closed van
Private Hospital1	<ul style="list-style-type: none"> – Solid wastes were collected every morning and disposed at the sanitary landfills at Matubog dumpsite – Infectious wastes were disposed in burial pits
Private Hospital 2	<ul style="list-style-type: none"> – Solid wastes were collected in black bag and disposed at the sanitary landfill in Matubog dumpsite every day – Hazardous and infectious wastes underwent pre-treatment and collected using yellow bag; transported in a closed van and disposed in San Clemente, Tarlac.
Public Healthcare Center	<ul style="list-style-type: none"> – Solid wastes were collected everyday, collected by the municipal dump truck and disposed at Matubog dumpsite
Clinic	<ul style="list-style-type: none"> – Solid wastes were collected by on-site waste collectors and collected by municipal dump truck every Tuesday morning – Infectious and hazardous waste were pre-treated and dump at the back of the clinic

Collection of waste in Public Hospital is done in a manner that prevents damage to the container. It is collected daily or as frequently as required. No bags are removed unless they are labeled with their point of production (hospital ward and department) and contents.

Collection of waste from the room is done every morning and afternoon. The solid wastes are collected by the municipal garbage collector truck. These are transported and disposed of in the Matubog dumpsite of Camiling while the infectious and hazardous wastes are disposed in burial pits.

Collection of waste in Private Hospital 2 is done using a black container for the general non-biodegradable waste which is collected every day at 8 am by the municipal garbage collector truck of Camiling and disposed it to Matubog dumpsite. The collection of garbage in each room in the hospital is made 3x a day or as needed. Yellow container or infectious and hazardous waste like body parts is collected every morning if ever the patient will not claim it. Their pathological wastes are stored in a secured bottle with formalin to preserve them before they are put in a concrete vault and finally bury it. A closed van is used to transport hazardous and infectious wastes in the disposal area at San Clemente, Tarlac. The municipal garbage collector truck of Camiling is used to transport all the solid wastes they generate in the Matubog dumpsite.

The general solid wastes in Public Healthcare Center are collected every morning by the municipal garbage truck. These are disposed of in Matubog dumpsite at Camiling, Tarlac.

The waste collector collects the waste in the room once a day every afternoon at the Clinic. The general wastes are collected by the municipal garbage truck every Tuesday morning. The syringes and other infectious and hazardous wastes are treated first before putting on a safety box (biohazard). All the hazardous and infectious wastes are buried behind the clinic.

Reuse and Recycle

Not all solid wastes are disposed. There are hospital wastes that are reused and recycled. The different ways of the health care units in Camiling are shown and described below.

Table 8: Reuse and recycle of hospital wastes of the five health care units in Camiling, Tarlac

Health Care Units (Hospitals, Health Center and Clinic)	Reuse and Recycle System
Public Hospital	- Practiced recycling
Private Hospital 1	- Practiced recycling - Treated material before reusing it
Private Hospital 2	- Did not practice recycling - Treated material before reusing it
Public Healthcare Center	- Did not practice recycling - Treated material before reusing it
Clinic	- Did not practice recycling - Treated material before reusing it

The Public Hospital practiced recycling. Solid wastes like plastic and glass, syringes, cartons, and vials are cleaned and transformed into decorations.

Private Hospital 1 treats the materials before reusing them. Wastes that were reused are gloves with no punctures or tears; those that were strong enough to be autoclaved; bonnets used during surgeries; left-over sutures at the operating room or delivery room; breakable bottles used with CTT; rubber-tubing used with suction machines; and CTT drainage. The hospital also recycles materials such as newspapers, cartons, empty water bottles, and IV plastic bottles. These recyclable wastes are sold by the maintenance personnel to junkshops.

Supplies used by Private Hospital 2 are disposable for the safety of people around including patients except their medical instruments used. Medical instruments went through a process of treatment with the use of autoclave machines before they are reused. Recycling of waste is not practiced in Public Healthcare Center. Materials being reused are treated and autoclaved before reusing them. The Clinic did not practice recycling waste generated. Some of the materials were put into the autoclave for treatment before reusing it.

Strategies in Implementing Waste Management Program

The Public Hospital followed the Health Care Waste Management System or HCWM of its institution. This is the systematic administration of activities that provide for segregation at source, segregated transportation, storage, transfer, processing, treatment, and disposal of healthcare waste that do not harm the environment. This complies with the DOH Standards.

The Private Hospital 1 Waste Management Program focused on source reduction by proper waste segregation, recycling, treatment, and residual disposal. Health Care Waste Minimization centered on how to reduce waste. This was done through reduction at source, which involved complete elimination of waste or lessening the waste generated. Reuse, recycling, and segregation of waste using the color coding scheme were done. To reduce waste at source the hospital purchased/selected supplies that were less wasteful and less hazardous. They used less hazardous methods in cleaning. To make their waste management program effective, they launched a massive educational and communication program for their staff. Periodic monitoring and evaluation of the program is done.

No strategies or specific program in support of waste management program was provided by 60% of the healthcare provider (Private Hospital 2, Public Healthcare Center, and the Clinic). But their segregation, storage, collection, and disposal of their wastes show that they adhere to the RA 9003 and DOH standards.

CONCLUSIONS

The adherence of the healthcare providers in Camiling, Tarlac to RA 9003 or the Ecological Solid Waste Management Act of 2000 and the DOH standards had fully prevented human health deterioration in the community but not land degradation. Their responsibility of ensuring that there is no adverse health in their management of healthcare wastes was because they consider first the health and occupational safety of the people.

Proper collection and disposal of solid wastes in the health care units have greatly helped in the control of insects, rodents, and filth-borne diseases and prevented fire-caused hazards by instantaneous combustion in the dumpsite. Proper treatment and disposal however of hazardous and infectious wastes have prevented the short and long-term irreversible health risks.

The off-site disposal of general residuals of the health care units in the Matubog dumpsite was along the stream of the household and commercial wastes of the Municipality. The infectious and hazardous wastes were treated and disposed of properly. However, burial as a means of disposing of infectious wastes is not sustainable and the lack of a common disposal system of infectious and hazardous wastes was practiced by the hospitals.

Between private and public health care units, the private hospitals were more conscientious in implementing their waste management program. The limited resources, facilities, and manpower while catering to more number of patients may be the reasons for the poor implementation of public hospitals in private hospitals.

RECOMMENDATIONS

Big or small institutions should have waste management written policies for the proper disposal of healthcare waste and strictly follow them. The Camiling Health Center should have concrete rules and regulations regarding healthcare waste management. Each unit should have a waste minimization written policy with specific goals, objectives, and timeliness to have a successful and sustainable waste management program.

The health care owners/administrators should not only consider burial ways of disposing of infectious wastes. Less permeable material should cover the burial pits to avoid seepage of liquid infectious wastes to the groundwater table and other run-offs. They should also consider other treatment methods such as radiation technology, encapsulation, inertization, etc. aside from the usual chlorination process that they employ to ensure the minimization of infection or widespread disease.

The Municipality of Camiling should allocate financial resources for the proper collection of hospital wastes. They have to ensure that hospital waste bags are properly labeled before collecting by their dump trucks. Healthcare wastes should be separately collected and disposed of from the residuals generated by the community. The Municipality should design and build a sanitary landfill, unlike the open dumping at Brgy. Matubog. Relocation of the dumpsite is worth reconsidering.

Government hospitals should allocate bigger funds for their waste management program. A stricter policy should be drafted and followed. It should also be part of their mission and goals. It should be a way of life for the healthcare providers. They have to be competitive with the private hospitals in implementing waste minimization programs.

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