International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

http://ijpsat.ijsht-journals.org
Vol. 14 No. 1 April 2019, pp. 41-49

Vulnerability of Healthcare Waste Cleaners to Occupational Injuries and Communicable Diseases in West Arsi Zone, Oromia Regional State, Ethiopia

Bewunetu Zewude (MA)
Wolaita Sodo University, Department of Sociology

Abstract - Health care facility cleaners and waste handlers are more vulnerable due to reasons associated to lower educational status, lack of relevant vaccinations and proper personal protective equipments, and most medical wastes commonly being handled and transported by hand. The purpose of the present study was to investigate the prevalence and level of vulnerability of medical waste cleaners in West Arsi zone, Oromia regional state, to various occupational injuries and communicable diseases.

An institutional based cross sectional study was undertaken in which quantitative data were collected from medical waste cleaners working in both public and private healthcare facilities using structured questionnaire. Data were collected from 102 samples by well-trained enumerators and entered in to SPSS version 20 to be analyzed in relation to the objective of the research at hand. Descriptive statistical tools were used to present data and interpreted according to the frequency distribution of cases identified therein. The target of the analysis was geared towards discovering whether occupational injury and related susceptibility prevails or not, as well as to what extent it does.

Findings revealed that medical waste cleaners in the study area are highly vulnerable to occupational injuries and communicable diseases. Blood contaminations, needle prick in the hand, cut by sharp materials and contact with other body fluids have been found to be risky incidents faced by the health care waste cleaners. The main source of susceptibility has also been found to be the failure of the survey population to use various types of occupational safety materials such as safety shoes, protective eye wear, and before and on-job safety trainings.

The exposure of medical waste cleaners to face risky incidents and infectious contaminations is because of institutional factors that are beyond their control; it is the failure of the management of the health care facilities to train their respective waste cleaners about safety measures and provide all the necessary equipments that led them to encounter the problems.

Key words - Cleaners, Injuries, Medical waste, West Arsi, Vulnerability

Corresponding Author: Bewunetu Zewude (MA)

I. Introduction

Most of medical wastes discharged from health care facilities can be hazardous if not properly disposed and carefully managed. Hazardous medical waste includes anatomical and pathological waste, sharps, infectious waste, expired chemical products and pharmaceuticals, and radioactive materials (UN Human Rights Council 2011). USAID (2015) adds a "highly hazardous" category to such medical wastes as stools from cholera patients, bodily fluids with highly infectious diseases, genotoxic wastes, and teratogenic wastes in addition to those mentioned under hazardous wastes above.

According to Caniato, Tudor, and Viccari (2016), not all health care wastes are disposed and managed safely, creating possible risks of injury, infection, and opportunities for even reuse in developing countries. Studies undertaken in Ethiopia by various researchers (e.g. Tadesse & Kumie 2014; Samuel & Wondimagegn 2016; Muluken & Abera 2010; Desta & Abera 2017; Azage, Gebrehiwot, and Molla 2013) indicate that health care facilities generate and dispose significant medical wastes but with poor waste management practices leaving both humans and the physical environment susceptible to various health risks. The types of care the health facility provides, as well as purchasing choices (reusable versus disposable items, packaging), affect the amount and toxicity of the wastes generated (Health care without harm 2000:3). People who come in direct contact with the waste – healthcare workers, cleaning staff, patients, visitors, waste collectors, disposal site staff, waste-pickers, drug addicts, and those who recycle contaminated syringes – are at greatest risk (USAID 2015; United Nations Human Rights Council 2011). The UN Hunan rights council (2011) posits that even though inappropriate disposal and poor management of medical waste is a potential health threat to all health care personnel, health care facility cleaners and waste handlers are more vulnerable due to reasons associated to lower educational status, lack of relevant vaccinations and proper personal protective equipments, and most medical wastes commonly being handled and transported by hand.

Notwithstanding the fact that medical waste cleaners are the most susceptible segments of health facility personnel, studies related to occupational injuries thus far focused either on municipal solid waste collectors (e.g. Daniel, Abera, and Worku 2013) or healthcare professionals per se (e.g. Tadesse, Alemayehu, and Nega 2018; Azage, et al 2013; Eden 2015). Published researches regarding exposure of medical waste collectors to potential health risks due to inappropriate practices of hazardous waste handling and management are hardly found in Ethiopia. The one undertaken by Alemayehu, Taddese, and Nega (2016) in Eastern Ethiopia assessed exposure of medical waste collectors to sharp injury, blood, and body fluid contaminations and found high exposure while handling medical wastes where factors such as not wearing glove, being uneducated, and not taking training were associated to the scenario. No related study, however, has been conducted and published in other parts of Ethiopia that made it difficult to see the replicability of the study's findings. Hence, the present study has aimed at assessing the vulnerability of healthcare waste cleaners in public and private health facilities of West Arsi zone, oromia regional state, Ethiopia.

II. Research Objective

The major objective of the research was to assess the prevalence of vulnerability of medical waste cleaners of healthcare facilities in West Arsi zone, oromia regional state, Ethiopia.

III. Research Methods And Materials

1.1. Study design

An institutional based cross sectional study was undertaken in which quantitative data were collected from medical waste cleaners working in both public and private healthcare facilities of West Arsi zone, Oromia regional state, from October, 2018 to December, 2018.

1.2. Methods

The prevalence and determinants of vulnerability of medical waste cleaners can better be studied using survey research method due to its advantage of enabling the researcher to collect ample data from large sample size and the reliability of the method itself. Accordingly, a structured interviewer administered questionnaire was employed to gather data. Considerable care has been made during question construction after which they were translated in to two local languages- *amaharic and afan oromo*. The questionnaire was filled by trained enumerators to avoid potential competence problems of the respondents. The data collected then were cleaned, organized, and entered in to SPSS version 20 for further processing. Data interpretation and analysis was carried out with descriptive statistical tools and presented using charts, percentages and frequency distributions.

1.3. Sampling

The study was undertaken in West Arsi zone, Oromia regional state, Ethiopia. West Arsi zone reportedly had 83 public health centers, 3 hospitals, and 38 health posts during the time of survey. From these, all the three hospitals and 30 health centers were randomly selected for the survey. In addition, 25 private health facilities were also considered. Ultimately, 102 health care waste cleaners were made to participate in the interviewer-administered survey using probability proportional to size sampling method. In order to avoid bias and give all potential research participants an equal chance of being selected, probability sampling design was used in determining research respondents. The lists and contact addresses of the cleaners were accessed from their respective health facilities. Using that as a sample frame, a systematic sampling technique was applied in selecting the final survey participants. Health posts were excluded from the survey since medical waste cleaners are not allocated to them.

IV. Results And Discussion

1.4. Results

1.4.1. Socio-demographic characteristics of respondents

Table 1. Socio-Demographic Distributions of Respondents

Variables	Categories	Frequencies	Percentages
Sex	Male	13	12.7
	Female	89	87.3
Age	1-20	11	10.8
	21-30	54	52.9
	31-40	26	25.5
	41-50	7	6.9
	51-60	4	3.9
	≥61	0	-
Marital status	Never married	38	37.3
	Married	56	54.9
	Divorced	5	4.9
	Widowed	3	2.9
Education	Never attended school	1	1.0
	1-4	8	7.8
	5-8	19	18.6
	9-10	35	34.3
	11-12	5	4.9
	10+3	31	30.4
	BA/BSC Degree	3	2.9
	MA/MSC & above	0	-
Religion	Orthodox Christian	14	13.7
	Muslim	53	52.0
	Protestant	32	31.4
	Catholic	2	2.0
	Others	1	1.0
	Total	**102**	**100.0**

Source: own survey

Table 1 shows the frequency distribution of the survey respondents in terms of their socio-demographic characteristics. Accordingly, 87.3% of the respondents were females while only 12.7% of them were males. Looking in to age, it has been found that most respondents were within the age category of 21-30, constituting about 53%, and few (3.9%) were found to be in their old age range, i.e. 51-60. Moreover, nearly 55% of respondents have been found to be married where as 37.3% have never married. Widowhood and divorce were almost insignificant occurrences among the participants (3 & 5, respectively). As far as the educational status of the respondents is concerned, respondents can be considered as 'fairly educated', relatively speaking. 30.4% of respondents were 10+3 or diploma certified while 34.3% completed high school education. This is a remarkable achievement when compared to the literacy level of the general population and the type of job in which they have engaged which is commonly perceived by the society as an area of work that requires little or no educational qualification. In the table, distribution of respondents in terms of their religious orientation has also been indicated. In this regard, Muslims have a dominant share (52%), followed by Protestants (31.4%) and orthodox Christians (13.7%).

The other relevant socio-demographic variable worth to mention here, though has not been included in table 1 above, is the household size of respondents. Statistical results from the survey showed that the mean/average household size was 4.9. Furthermore, the minimum and the maximum household size of the respondents have been found to be 1 and 10 respectively. In addition, the differential distribution of work experiences across the respondents has also been calculated in which 53.9% of them worked for 1-5 years as medical waste cleaners, 24.5% revealed to have worked for less than a year. Nevertheless, only 1 respondent had 21 and more years work experience. Results of descriptive statistics showed that the mean work experience of the respondents was 2 years.

1.5. Vulnerability of Medical waste cleaners

Table 2. Frequency Distribution of Respondents In Terms of Vulnerability to Occupational Diseases and Injuries

Description	Response	Frequency	Percentage
Respondents who took occupational Safety training before starting job	YES	39	38.2
	NO	63	61.8
Respondents who took on-job occupational safety trainings	YES	43	42.2
	NO	59	57.8
Reasons for not taking occupational safety trainings	**Not available**	**58**	**98.3**
	Was not interested	**1**	**1.7**
	Total	59	100
Respondents who wear safety shoes during waste cleaning	YES	37	36.3
	NO	65	63.7
Reasons for not wearing safety shoes	Not available	63	95.5
	Carelessness	2	3.0
	Not comfortable	1	1.5
	Total	66	100.0
Respondents who wear hand gloves during waste cleaning	YES	87	85.3
	NO	15	14.7
Respondents who wear protective mouth/nose wear during waste cleaning	YES	77	75.5
	NO	25	24.5
Respondents who wear protective eye wear during waste cleaning	YES	12	11.8
	NO	90	88.2
Respondents' Reason for not wearing protective eye wear	Not available	84	**91.3**
	Carelessness	4	4.3

	Forgetting	2	2.2
	Not comfortable	1	1.1
	For unknown reason	1	1.1
	Total	92	100.0
Total		**102**	**100.0**

Source: own survey

Table 2 shows the frequency distribution of survey respondents in terms of vulnerability to occupational disease and injury, and the circumstances under which such vulnerability prevailed. It has been found that 61.8% of respondents have not taken occupational safety trainings before starting their job, while 57.8% of them replied that they have never been provided with occupational safety trainings during the course of doing their job (on-job training). In the table, the reasons explaining failure of the indicated percentage of respondents to take safety trainings before starting job have also been indicated. Accordingly, out of the respondents who replied that they didn't get such trainings, 98.3% of them answered that it was because of the lack of such trainings, while only 1.7% of them were 'not interested' to do so in case the opportunity was available.

Data in table 2 above also reveals how the practice of wearing safety shoes while cleaning medical waste is very low among the respondents. It has been shown that 63.7% of respondents do not wear safety shoes at all. Once again, the absence of such safety material in their respective health care facilities has been mentioned as a reason for most respondents (95.5%). Carelessness (3%) and feelings of discomfort when wearing the shoe (1.5%) have also been presented as the other reasons for respondents not to wear safety shoes when cleaning medical wastes. On the other hand, positive scenarios have been observed from data in the table as far as the practices of wearing hand gloves and protective mouth/nose wear during cleaning health care waste is concerned. It has been observed that 85.3% of respondents use hand gloves as safety measures during work. Furthermore, 75.5% of them replied that they use mouth/nose wear while cleaning medical wastes.

Looking in to the frequency distribution of respondents in terms of wearing protective eye wear, 90 of 102 respondents disclosed that they do not use such devices at all. As shown in the table, the main reason for the 91.3% of respondents has been the failure of their health care facility to supply such safety materials, followed by carelessness, forgetting, discomfort, and unknown reason (4.3%, 2.2%, 1.1.%, & 1.1% respectively). The overall picture in the data presented in table 2 above can lead one to generalize that health care waste cleaners in the study area are vulnerable to occupational diseases and injuries mainly because of the fact that safety devices and measures that otherwise could have been used to minimize such vulnerabilities could not be provided by the respective health care facilities for which the cleaners work.

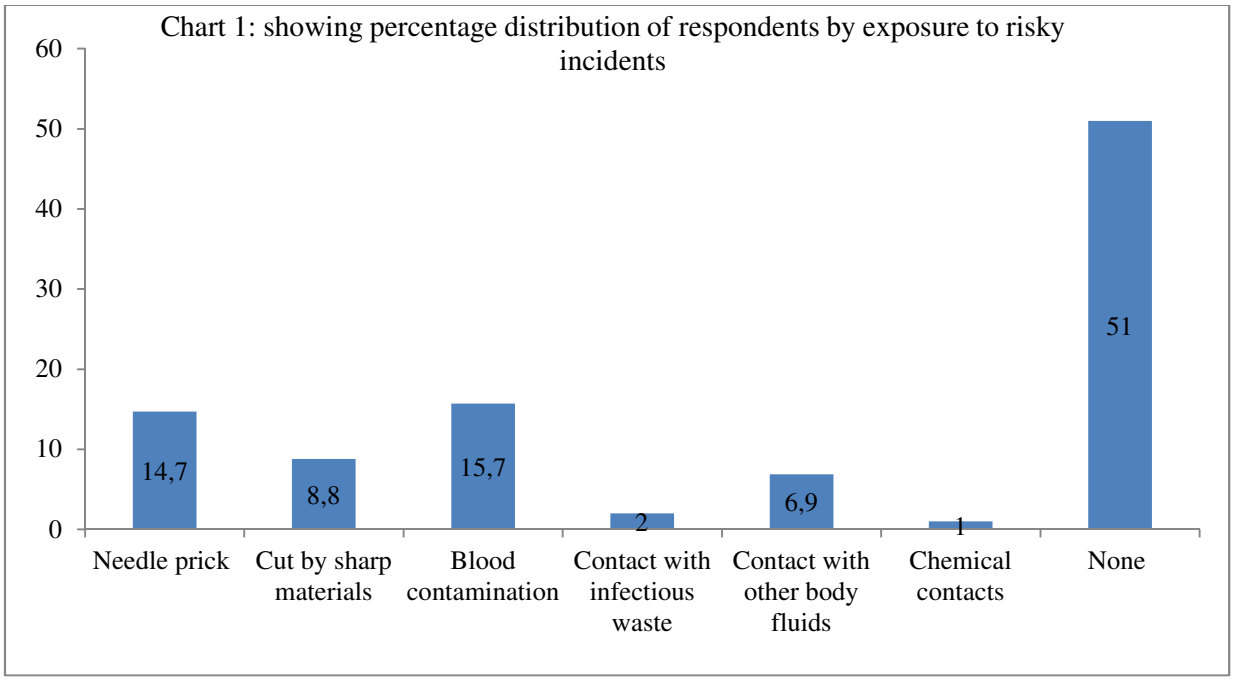

Chart 1 above displays the frequency distribution of respondents in terms of their exposure to various kinds of risky incidents related to their job. Accordingly, 15.7% of respondents have ever faced blood contaminations, 14.7% have ever been exposed to needle prick, 8.8% have encountered incidents of being cut by sharp materials, and about 7% of them replied to have had contact with other infectious body fluids of patients. Most importantly, 51% of respondents replied to have never faced any risky incidents to the date of data collection.

Table 3. Showing the Distribution of Respondents by the Frequency of Occupational Injuries/Infectious Contaminations Faced During the Last 12 Months

Frequency of injuries/risky contaminations faced		Frequency	Percent
	1	33	32.4
	2	24	23.5
	3	11	10.8
	4	1	1.0
	5	2	2.0
	0	31	30.4
	Total	102	100.0

Source: own survey

In table 3 above, it has been shown that 32.4% of respondents encountered occupational injury or infectious fluid contaminations once during the past 12 months of the survey. Furthermore, 10.8% replied to have faced 3 injuries or risky contaminations during the specified period. It has also been found that 23.5% of them faced 2 risky patient body fluid contaminations or injuries. Above all, it has also been indicated in the table that 30.4% of respondents faced no such contaminations or injuries for the last twelve months.

V. Discussion

Findings revealed that medical waste cleaners in the study area are highly vulnerable to occupational injuries and

communicable diseases. Blood contaminations, needle prick in the hand, cut by sharp materials and contact with other body fluids have been found to be risky incidents faced by the health care waste cleaners. The main source of susceptibility has also been found to be the failure of the survey population to use various types of occupational safety materials such as safety shoes, protective eye wear, and before and on-job safety trainings. The finding of the study is consistent with the one found by Tadesse, et al (2016) in their study of the exposure of medical waste collectors to hazardous wastes and occupational accidents in Eastern Ethiopia. According to their research, 30% and 43.8% of medical waste collectors were exposed to any sharp materials and blood and other body fluids respectively. In addition, they have also stated factors such as not wearing glove, being uneducated and not taking trainings to have been associated with the scenario. In selected cases nevertheless, some findings of their study contradict to the one found by the present research. For example, they found that 95.7% of their respondents wear masks and 54.4% of them had some trainings regarding waste management. In the present study however, only 38.2% of respondents received some trainings and 90 of 102 respondents disclosed that they do not wear protective eye wear while cleaning medical waste. Medicines waste management and disposal directives of Ethiopian food, medicine and health care administration and control authority (2011) dictates that all workers who are involved in a disposal process shall wear appropriate personal protective equipment such as overalls, boots, gloves, safety glasses/goggles, masks, and caps. The law under proclamation No. 300/2002, clearly stipulated that any person engaged in the collection, recycling, transportation, treatment or disposal of any hazardous waste shall take appropriate precaution to prevent any damage to the environment or to human health or well-being (article 4/2).

These findings are also parallel to findings of studies undertaken in other parts, especially in the developing regions of the world. For instance, a research conducted in Dhaka, Bangladesh, by Masum, William, & Mosharraf (2011) revealed medical waste operatives to be untrained that are left with no understanding of the hazards involved. Moreover, they found personal protective equipments were inadequate which led the workers to face frequent accidental injuries. Another study undertaken in Kenya by Moses (2017) found biomedical waste handlers to be at high risk of communicable diseases and including exposure to risks of injuries from pricks in the hands and potential contaminations. The study further argued that the failure of employers to comply with the statutory laws, regulatory requirements and the lack of reliable accident management best practices to safeguard bio-medical waste handlers to have contributed for the vulnerability of the waste handlers to risks of injuries. The UN Hunan rights council (2011) posits that even though inappropriate disposal and poor management of medical waste is a potential health threat to all health care personnel, health care facility cleaners and waste handlers are more vulnerable due to reasons associated to lower educational status, lack of relevant vaccinations and proper personal protective equipment's, and most medical wastes commonly being handled and transported by hand.

Furthermore, it has also been revealed that the health care cleaners are victims of the inability of health facility owners or administrators to provide all the necessary proactive safety measures against potential risks. For instance, it has been shown that out of the 66 respondents who hadn't received safety trainings, 95% of them replied that it was due to the absence of such trainings that they didn't do so. Such findings brings us to the statement that medical waste cleaners have become vulnerable to and have encountered occupational injuries because of institutional circumstances that are beyond their control. In other words, the vulnerability of the study population has not emanated from factors inside of the victims themselves, including lack of awareness and reluctance.

Table 4. Knowledge Of Respondents About Disease Transmission By Contaminations

Do you know that disease can be transmitted by contaminations with infectious medical wastes?		Frequency	Percent
	yes	98	96.1
	no	4	3.9
	Total	102	100.0

The finding indicated in table 4 above confirms the above argument. There, it has been shown that 96.1% of respondents have the awareness that disease can be transmitted via contaminations of infectious medical wastes. This might be related to the fact that most respondents are fairly educated, as shown in table 1 above. This finding is very interesting in the sense that it takes us away from the commonly held "blaming the victim" generalizations. The finding of Alok, Varsha, Swati, et al (2013), though their study was done on a different population, i.e. health care personnel, contradicts with the one found in this study. They found that the health care personnel studied had a poor level of knowledge and awareness of biomedical waste generation hazards.

VI. Conclusion

The purpose of the present study was to investigate the prevalence and level of vulnerability of medical waste cleaners in West Arsi zone, Oromia regional state, to various occupational injuries and communicable diseases. Quantitative data were collected from 102 samples by well-trained enumerators and entered in to SPSS version 20 to be analyzed in relation to the objective of the research at hand. Descriptive statistical tools were used to present data and interpreted according to the frequency distribution of cases identified therein. The target of the analysis was geared towards discovering whether occupational injury and related susceptibility prevails or not, as well as to what extent it does.

Medical waste cleaners in Waste Arsi zone, Oromia regional state, are highly vulnerable to occupational injuries and communicable diseases potentially acquired through contaminations with infectious health care wastes. The inability of the health care waste cleaners to obtain safety trainings both before starting the job and in the course of doing it, not using safety shoes, and protective eye wear have contributed for the vulnerability situations of the study population. Above all, the exposure of medical waste cleaners to face risky incidents and infectious contaminations is because of institutional factors that are beyond their control; it is the failure of the management of the health care facilities to train their respective waste cleaners about safety measures and provide all the necessary equipments that led them to encounter the problems.

References

[1] Alemayehu T, Worku A, Assefa N. Medical Waste Collectors in Eastern Ethiopia are Exposed to High Sharp Injury and Blood and Body Fluids Contamination. Prev Inf Cntrl. 2016, 2:2.

[2] Alok Sharma, Varsha Sharma, Swati Sharma, & Prabhat Singh. Awareness of Biomedical Waste Management Among Health Care Personnel in Jaipur, India. OHDM - Vol. 12 - No. 1- March, 2013

[3] Azage Muluken, Gebrehiwot, and Molla Mesafint. Healthcare waste management practices among healthcare workers in healthcare facilities of Gondar town, Northwest Ethiopia. Health science journal, Vol. 7 (2013), issue 3

[4] Caniato, M.; Tudor, T.L.; Vaccari, M. Assessment of health-care waste management in a humanitarian crisis: A case study of the Gaza Strip. Waste Manage. 2016, 58, 386- 396.

[5] Daniel Bogale, Abera Kumie and Worku Tefera. Assessment of occupational injurie among Addis Ababa city municipal solid waste collectors: a cross-sectional study. BMC Public Health 2014 14:169.

[6] Desta Debalke & Abera Kumie. Healthcare waste management: the current issue in Menelik II referral hospital, Ethiopia. Current world environment, Vol. 12(1), 42-52 2017

[7] Eden Girmaye. Assessment of percutaneous exposure incidents and associated factors among health care personnel at Gandhi memorial hospital, Addis Ababa. Unpublished thesis submitted to the school of graduate studies, Addis Ababa University, 2015.

[8] Federal Negarit Gazeta . (2002). Environmental Pollution Control Proclamation, Proclamation No. 300/2002. Addis Ababa : Ethiopia

[9] Food, Medicine and Healthcare Administration and Control Authority of Ethiopia. (2011). Medicines Waste Management and Disposal Directive. Addis Ababa:

i. Ethiopia

[10] Health care without harm. 2000. Medical Waste Treatment Technologies: evaluating non-incineration alternatives, a tool for health care staff and concerned community members

[11] Moses Nguthu Mburu. (2017). Occupational Safety and Health Accidents among Biomedical Waste Handlers in Nairobi City County, A thesis submitted to Jomo Kenyatta University in partial fulfillment for

the requirements of Masters Degree in Occupational Safety and Health

[12] Masum. Patway, William Thomas O'Hare, Mosharraf H. Sarker. Assessment of occupational and environmental safety associated with medical waste disposal in developing countries: A qualitative approach. Safety Science 49 (2011) 1200–1207

[13] Muluken Azege & Abera Kumie. Health care waste generation and its management system: the case of health centers in West Gojjam zone, Amahara region, Ethiopia. *Ethiop. J. Health Dev.* 2010;24 (2):119-126

[14] Samuel Fikadu Haileyesus & Wondimagegn Cherinete. Health Care Waste generation and Management in Public health care facilities in Adama, Ethiopia. Journal of Health and Pollution 2016 Vol.6, No. 10

[15] Tadesse Alemayehu, Alemayehu Worku, and Nega Assea. Knowledge and practice of healthcare workers about standard precaution: special emphasis on medical waste management in Ethiopia. International Journal of Infection Control 2018, v14:i2

[16] Tadesse and Kumie: Healthcare waste generation and management practice in government health centers of Addis Ababa, Ethiopia. BMC Public Health 2014 14:1221.

[17] United Nations Human Rights Council. 2011. Report of the Special Rapporteur on the adverse effects of the movement and dumping of toxic and dangerous products and wastes on the enjoyment of human rights, Calin Georgescu

[18] USAID. 2015. Health care waste: sector environmental guidelines. Accessedfromwww.usaidgems.org/bestPractice.htm