The Evaluation of the Medical Waste Control Regulation of Turkey in Comparison with the E.U. Environmental Directives

B. Aylin Alagöz, Günay Kocasoy, Meltem Kılıç, Boğaziçi University, Institute of Environmental Sciences

CONTACT
B. Aylin Alagöz
Boğaziçi University, Institute of Environmental Sciences
Hisar Campus, Bebek, 34342, İstanbul
Turkey
Phone no: +90 212 359 45 99
Fax no: +90 212 257 50 33
E-mail: aylin.zeren@boun.edu.tr

EXECUTIVE SUMMARY

The management of the health-care wastes in Turkey is one of these environmental subjects to be considered. The amount of waste from health-care facilities in Turkey is a significant portion of the total waste generated and therefore requires efficient management and control systems by a specific Regulation. Turkey, as a candidate State, has to adapt the EU Environmental Directives into its national legislation to get a full membership in the European Union. Within this study; present and previous experiences of several candidate and member states were examined and found that Environment is one of the most challenging topics in negotiations.

Turkish legislators have approached the control of the health-care wastes by publishing a single regulation that deals with the subject in an integrated approach. With this purpose, the “Turkish Medical Wastes Control Regulation (TMWCR)” was adopted in May 20th, 1993 (Ministry of Environment and Forestry, 1993). This Regulation was the basis for improving the healthcare waste practices in the country. It establishes the legal controls and permits concerning the management of these wastes.

Although the “Turkish Medical Waste Control Regulation” had been published more than ten years ago, it was not applied regularly. When the existing Regulation was evaluated, it was found out that the Turkish Medical Waste Control Regulation had insufficient content for an efficient health-care waste management both at the institutional and administrative level and it needed a significant revision.

When the European Union Legislation for the health-care wastes was reviewed, it was observed that there is no single Directive, Decision or Regulation referring to the management and disposal of the health-care wastes. Rather than a single legislative action that directs the handling of wastes from health-care related facilities (producers), there are a number of Directives, Decisions and Regulations that describe the measures to be taken for various types of wastes (municipal, hazardous, dangerous, toxic, infectious, etc.).
For the achievement of a more comprehensive Regulation that will be obtained by the new modification, the EU Directives and Legislations were analyzed and a new, more applicable Regulation was published at 2005 (Ministry of Environment and Forestry, 2005). Within the scope of this study, it is intended to encourage and support the health-care institutions in İstanbul to comply with the revised and published “Turkish Medical Waste Control Regulation” which governs the health-care waste management in Turkey.

In addition to the revised and added new items to comply with the EU Legislation, activities to change the institutional structure in solid waste management in general and consequently in the health-care waste management have been started.

At the end of this study, the review of the Turkish and international institutional and legislative framework was conducted. Present applications, evaluation of the old and the revised Turkish Medical Waste Control Regulation and the comparison with the European Union Legislation and the institutional structure as well as the proposals for the improvement of the health-care waste management were investigated in detail. The proposals for the improvement/revision of the Regulation were developed and submitted to the Ministry of Environment and Forestry and the Ministry of Health. All of the suggestions made in the framework of this study, were taken into consideration in publishing the new Medical Waste Control Regulation.

INTRODUCTION

Health-care wastes are potential sources of risk to public health mostly in the middle and lower-income countries. Although central governments in these middle and low income countries are often keen to legislate against environmental pollution, they can not implement the published legislation because of the lack of financial resources.

The control of the health-care waste management is also one of the most significant environmental problems in Turkey that should be solved. The management of the health-care wastes in Turkey is conducted according to the Turkish Medical Wastes Control Regulation that was adapted in 1993 (Ministry of Environment and Forestry, 1993). In the Regulation, the procedures about the classification of the wastes, collection, transportation, and temporary storage of the wastes within the institutions and the transportation of the wastes to the final disposal area are explained. In the last part of the Regulation, the method of the disposal of the wastes is mentioned. According to the Regulation, the incineration of the health-care wastes is taken as the basis for the final disposal method.

Within the scope of this study, it is intended to create an integrated health-care waste management in Turkey. Therefore, the existing institutional and legislative framework as well as the E.U. Commission Decision and Directives have been analyzed from the point of health-care wastes. In the following sections, the subjects undertaken within the scope of the study, the obtained results as well as the points about the health-care waste management are all summarized. This paper presents guidelines that can be used by the health-care waste authorities to evaluate and assess the existing situation about the health-care wastes.

METHODOLOGY

Review of the Turkish Institutional and Legislative Framework

When the historical developments in the waste management from the point of legislations in Turkey was evaluated, it was found out that in 1991, the Ministry of Environment in Turkey published the Environmental Law 2872 as the first stage in order to improve the environmental
situations that the country was in. On March 14th of the same year the “Solid Waste Control Regulation” was published in order to extend on the articles of Law 2872 (Lebib Yalkın Publications, 2005). The Regulation presents an integrated approach on solid waste management including criteria on the collection, transportation and final disposal of the solid wastes. Topics such as waste minimization and recycling were covered within the Regulation. However, the management of hazardous as well as medical (health-care) waste was not included.

In addition to these regulations at the same years, Turkey also ratified the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal in 1994 (Basel Convention, 2000). Although the health-care wastes were covered in a Regulation published on March 20th 1993, the hazardous waste was dealt with by the “Hazardous Waste Control Regulation”, published in 1995.

The Turkish Medical Wastes Control Regulation (TMWCR) consists of eight sections. The First Section of the Regulation defines the sources and characteristics of the solid wastes originated from the health-care institutions and related sectors. Following the definitions and other specifications the Second Section of the Regulation indicates the principles of the separate collection, temporary storage, documentation and the transportation of the infected wastes to the final disposal site.

The principles of the separate collection and handling of infected medical wastes, sharps and hazardous chemical wastes are explained in the Third Section of the Regulation while the location and the technical specifications of the temporary storage room and its cleaning principles are explained in the Fourth Section. Rules about the transportation of the infected wastes to the final disposal area, specifications of the trucks and the required training of the personnel working in this field are explained in the Fifth Section.

The Sixth Section gives the technical specifications of the incinerators, the allowable emission standards, procedures for the license of the location and the operation of the incinerators. The control methods and cancellation of the license are also explained in the same section.

The location of the site, technical specification of the preparation of the landfill areas, the drainage systems, operational rules and after care principles are given in the Seventh Section of the Regulation. In the Eight Section the follow up and the control mechanisms of the infected wastes, responsibilities of different institutions such as the municipalities and ministries are explained.

The list of the by-products of non-hazardous chemical compounds, criteria of hazardous chemical wastes, recoverable hazardous wastes, drawings and design of the sanitary landfills for the infected health-care wastes and the documentation and typical tracking forms are given as Annexes in (1 to 8) of the Regulation.

As it has been mentioned previously, Turkish legislators have approached the control of the health-care wastes by a single Regulation. The other standards set by the Turkish Medical Wastes Control Regulation are for the following (Kocasoy, G., et al., 2004):

- requirements to be complied by the producers of the health-care wastes,
- requirements of the segregation procedure of the wastes at the source (use of a various colour bags and their specifications),
- documentation to be used within the facility,
- design criteria of the temporary storage facilities of the various waste streams within the health-care institutions,
- authorities and procedures for licensing the temporary storage facilities,
- operation and control of the temporary waste storage rooms,
• rules of waste transportation and the specifications of the transportation vehicles and the personnel’s apparel.

The Evaluation of the European Union Legislations

When the European Union legislation for the health-care wastes was reviewed, it is observed that there is no single Directive, Decision or Regulation referring to the management and disposal of the health-care wastes. Instead of a single legislative action that directs the handling of wastes from health-care related facilities (producers), there are a number of Directives, Decisions and Regulations that describe the measures to be taken for various types of wastes (municipal, hazardous, dangerous, toxic etc.). The hypothesis made for the collection of the legislative acts is that health care waste is made up by:

• Non hazardous waste
  o Non-risk or “general” health care waste comparable to domestic waste
  o Pressurized containers

• Hazardous waste
  o Infectious waste
  o Pathological waste
  o Pharmaceutical waste
  o Genotoxic waste
  o Chemical waste
  o Heavy metal waste

• Radioactive waste

The investigated European Legislations within the scope of the study for the non-hazardous wastes can be given as follow:

• Commission Decision 2001/118/EC of 16 January 2001 amending Decision 2000/532/EC as regards the list of wastes
The investigated European Legislations related with the hazardous wastes are presented below:

Among these Directives, Council Directive 91/689/EEC is the only Directive which has more clauses about the hazardous health care wastes.

EVALUATION AND COMPARISON OF THE TURKISH AND THE EUROPEAN COMMISSION LEGISLATIVE BODIES

Due to the lack of a single European Directive that deals with the wastes originating from the health-care facilities, the above-mentioned topics covered by the TMWCR cannot constitute a topic of comparison and eventual evaluation. The items examined both by the Turkish and the European Commission legislative bodies and their comparison are given in the following sections (Kocasoy, et al., 2004):

Hazardous Substances

The wastes arising from the health-care facilities have been included in Chapter 18 of the European Waste Catalog (Commission Decision 2001/118/EC) (http://www.europa.eu.int). On the other hand, Turkish Medical Wastes Control Regulation (TMWCR) describes the safe chemical substances, the recoverable dangerous chemicals and the chemicals having potential for dangerous reactions in detail in Annexes. It is observed thus, that the Turkish legislation names specific chemicals while classifying them in various categories of the health-care wastes, whereas the European legislation does not.

The positive aspect of this is that the officers dealing with the management of the chemicals in the health-care facilities have a thorough knowledge of what chemicals are considered hazardous and can deal with them in the most appropriate manner. On the other hand, there is no provision on the management of the new chemicals or chemicals of similar origin that have similar applications to the ones that are classified as hazardous chemical. The latter fact creates a potential for the mismanagement of the new hazardous substances. The Regulation should be reviewed and updated periodically by the Turkish authorities in order to keep up with the changes in technology. It is advised that the new categories should be generated for all the hazardous chemicals handled in the health-care units.

Annex 2 of the TMWCR sets the criteria for the classification of the wastes as dangerous substances. The criteria set by the European legislation and in particular by the Directive 91/689/EC are more strict and updated. It is suggested that the Annexes of the European Directive should be used in order to set the criteria for classifying a substance as hazardous.

Incineration of Wastes

Section 6 of the TMWCR refers to the incineration of wastes, criteria for licensing and control of the incineration plants (articles 25 to 31). The incinerators constructed for the domestic nature wastes cannot be used for the health-care wastes. The temperature at the pre-combustion chamber should be at 900°C and the combustion gases should pass through the secondary chamber at 1200°C and have a residence time of a minimum 1.5 seconds. The European Directive 2000/76/EC “on the incineration of waste” states that the combustion gas should be raised to a temperature of 850°C for two seconds (http://www.europa.eu.int). If the halogenated organic substances of the waste exceed 1% (expressed as chlorine), then the temperature has to be raised to 1100°C while the residence time remains constant at 2 seconds.

According to the TMWCR, improperly incinerated material should not exceed 2% of the total mass by weight while the Directive 2000/76/EC calls for a maximum loss of 5% of the dry weight of the material.
The emission levels set by the above mentioned legislative actions are identical for the parameters such as total dust, HCl, HF, SO₂, TOC and furans. The Turkish legislation though is stricter on the VOₓ emissions; the European legislation has lower limits for the concentration of heavy metals at the effluent gas.

The EC Directives includes the provisions for the start-up and shut-down as well as for an auxiliary burner that switches on and off automatically in order to avoid a drop at the set temperature.

Both legislations require a permit for the operation of an incinerator and state that a competent authority will have the supervision of such plants (Turkish Legislation names the Ministry of Environment and Forestry as the relevant authority. The Metropolitan Municipality controls the plants within the metropolitan areas, while the provincial governors responsible are for the areas outside the metropolitan areas and suburban areas). In case of the facilities which are not complying with the Regulation, the competent authority shall take the action to enforce the compliance both in TMWCR and the European Directives.

Additional provisions of the 2000/76/EC Directive are directions on the procedures to be followed during the delivery and reception of the wastes to be incinerated as well as the analysis requirements, access to information and public participation, abnormal operating conditions and review clauses. These provisions along with the stricter limit values on the concentration of the heavy metals in the effluent gas and the auxiliary burner should be taken into consideration in future legislative efforts for the TMWCR.

**Landfilling of Wastes**

Both legislations, TMWCR and Council Directive 99/31/EC on the land filling of the wastes, set similar location requirements for landfills as well as the minimum distance to the groundwater table. In particular, they stress the significance of considering the requirements relating to the geological and hydrogeological conditions of the site, its proximity to residential and recreational areas as well as surface waters, waterways, etc (http://www.europa.eu.int).

The foundation of the disposal site specifications set by the 99/31/EC Directive is a stricter one (mineral layer of 5 meters in thickness compared to 2.5 meters). The drainage layer in the European Legislation is also stricter (0.5 meters compared to 0.3 meters).

As far as the top cover of the landfill site, both legislative actions call for the installation of an artificial and a mineral layer. While the TMWCR specifies the thickness of the artificial and the mineral layer (top soil cover of 1 meter in thickness), the European Directive does not.

Application for a landfill permit includes minimum specifications such as the id of the applicant, type and quantity of the waste to be disposed of, proposed operation, monitoring and control plan as well as the plan for the closure and aftercare procedures etc.

Waste acceptance procedures, such as checking of the documentation and visual inspection are covered by both the Turkish Medical Wastes Control Regulation and the European Directive 2000/76/EC; but the European Legislation requires the sampling and analyses of the waste in certain cases, as well as the existence of a receipt that needs to be kept updated with information about the origin, quantities and the date of delivery of the wastes.
PROPOSALS FOR THE IMPROVEMENT OF THE TURKISH LEGISLATION ON THE HEALTH-CARE WASTES

Since there is no single European legislation allocated for the health care waste management, the guidelines of the World Health Organization for the minimum requirements of health care waste management legislation have been used as indicative broad guidelines, in order to make proposals for the improvement of the Turkish legislation and the compliance with the EU standards.

The results of this study are presented in the following items (Kocasoy, et al., 2004; Zeren, 2004; Kılıç, 2004):

- For the clear definition of hazardous health-care waste and of its various categories in TMCWR, the wastes should be classified according to the EC Directive 91/689 and the European Waste Catalogue.
- For the precise indication of the legal obligations of the health-care waste producer regarding safe handling and disposal; the obligations of each party should be clarified to a further extent.
- The statement in Article 25 should be changed with the new statement as: “Before the final disposal of the health-care wastes; source reduction, segregation and reuse should be the initial alternatives to be considered. After these stages, sterilization, incineration and the landfilling should be considered as the disposal methods”
- There is no provision in the Regulation for the designation of courts responsible for handling disputes arising from enforcement or of non-compliance with the law. The issue should be clarified.
- For the specifications for an inspection system to ensure enforcement of the law, penalties to be imposed for contravention and the inspection procedures should be clarified. During the research it had been observed that the institutions which are aware of the legislation requirements about the health-care waste management were 36.3 per cent. This was 13.7 per cent when the Hazardous Waste Control Regulation of Turkey was questioned. The situation is worse especially at the state and the research hospitals, which are the largest and the most crowded ones. This is mostly because of the inefficient control and enforcement of the Municipality and the Ministry of Environment and Forestry. It should be realized that all the health-care institutions should be enforced to be aware of the existing Regulation and accomplish the requirements by the routine and systematic inspections of the authorities.

In addition to these, also the following provisions should be taken into account. The provisions that the European Directive has but the TMWCR does not are the following ones:

- the installation of a drainage system for the top cover of the sanitary landfills,
- measures to minimize hazards arising from noise and traffic, birds, vermin and insects, formation of aerosols, fires, emissions of odours and dust etc.,
- barriers to prevent free access to the site,
- guidelines for the acceptance criteria and procedures to be followed for the received wastes (although TMWCR refers to the checking of the waste upon receipt in order to verify the correctness of the description of the waste given on the official reporting form),
- control and monitoring procedures in the operation and after-care phases.
TMWCR calls only for the authorized agents who are responsible for controlling the received waste and the operation of the landfill; it also requires testing of the quantity and quality of the generated leachate starting at the first day of operation and continuing till 10 years after the closure of the disposal area.

TMWCR does not specify the data to be collected. Directive 99/31/EC requires data collection on:

- the meteorology of the area that the landfill is located at (volume of precipitation, temperature, evaporation, humidity, etc.),
- leachate (quantity and quality),
- surface water (quality and quantity),
- groundwater (level and composition),
- topography of the site (data on the structure/composition of landfill body, settling behavior),
- specifications of the landfill permit,
- cost of the landfilling of the waste.

After these suggestions about the legislative items as well as the recommendations related to the management procedures in and outside of the health-care institutions are discussed with the Ministry of Environment and Forestry; the existing Regulation is revised and by taking the revealed deficiencies and the suggested solutions into considerations; a new Medical Waste Control Regulation has been adapted and published (Ministry of Environment and Forestry, 2005).

**CONCLUSION**

In the scope of this study, the review of the Turkish and international institutional and legislative framework was conducted. When the Turkish Medical Wastes Control Regulation was examined, it was determined that the current Regulation did not have sufficient information about the management of the health-care wastes. For the achievement of a more comprehensive Regulation that will be obtained by the new modifications, the EU Directives and Legislations were analyzed.

The suggestions for the determined deficiencies are submitted to the Ministry of Environment and Forestry. These proposals as the result of this study are accepted by the Authorities of the Ministry and a more applicable Medical Waste Control Regulation has been adapted and published at 2005.

In addition to the revised and added new items to the Regulation to comply with the EU Legislation, suggestions about the institutional structure in solid waste management in general and consequently in the health-care waste management was also proposed and accepted by the related authorities. Due to the page limitation, this part of the research is not included in the manuscript.

Finally, this study had pointed out the significant points to be corrected on and it has achieved its purpose/target by the cooperation of the related Ministries and the authorities in the management of the health-care wastes. During the monitoring of the implementation of the results of the research, it was observed that the management of the health-care wastes in many institutions has been tremendously improved. It is believed that in the near future, the management of the health-care wastes will be much better in all the cities of Turkey.

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