

**Assessment and national report of R. Macedonia on the existing training provisions of professionals in the Healthcare Waste Management industry**

**REPORT: I**



**DEVELOPING AN EU STANDARDISED APPROACH TO VOCATIONAL QUALIFICATIONS IN HEALTHCARE WASTE**

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**National Report on Training Provisions of Professionals  
in the HWM Industry**

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## National Report on Training Provisions of Professionals in the HWM Industry

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## CHAPTER 1 EXECUTIVE SUMMARY

The present report intends to describe the National scenario related to the healthcare sector, analysing in details the issue of healthcare waste produced taking in the light of current legislation.

In RM the healthcare sector is represented by a multitude of structures, diverging in terms of size and primary health care services provided, that are divided between the public and private sector, almost on equal share.

The secondary and tertiary level of healthcare service and providers belongs mainly to the public healthcare sector, with ongoing trend of increasing number of private specialist practitioners and private healthcare facilities that can provide secondary and tertiary level of healthcare services.

Based on the findings from the audit and desk research, it can be assumed that 1200-1500 T/y of infectious HCW and around 300 T/y of other hazardous waste is generated annually in public healthcare facilities in R. Macedonia

Waste generation rates in each region, based on the above calculations are enclosed in the following table:

Operative Healthcare Regions	Infectious Waste		Other Hazardous waste	
	Infectious Waste Secondary and Tertiary PIH's	Infectious waste Primary PIHs	Other Hazardous Secondary and Tertiary PIH's	Other Hazardous Waste Primary PIHs
Pelagonia Region	515,14	154,54	128,79	38,64
East Region	176,06	52,82	44,02	13,20
South East Region	222,05	66,62	55,51	16,65
UCC Mother Theresa Skopje	514,80	154,44	128,70	38,61
Skopje Region	691,55	207,46	172,89	51,87
Polog Region	219,30	65,79	54,83	16,45
South West Region	310,25	93,08	77,56	23,27
Vardar Region	170,91	51,27	42,73	12,82
North East Region	117,37	35,21	29,34	8,80
<b>TOTAL Waste kg/day</b>	<b>2937,45</b>	<b>881,23</b>	<b>734,36</b>	<b>220,31</b>
<b>TOTAL Waste tons/year</b>	<b>925,30</b>	<b>277,59</b>	<b>231,32</b>	<b>69,40</b>
<b>TOTAL Waste Streams tons/year</b>	<b>1202,89</b>		<b>300,72</b>	

Having in mind the national situation, this report has been prepared based on the audits performed by the consultant.



## CHAPTER 2 OVERVIEW OF THE HEALTH CARE SECTOR

### 2.1 General description of the Health Care System

The existing network of PHIs in Macedonia provides a dispersed healthcare system that appropriately covers the country's territory and population. The size and types of services in specific PHIs reflect mostly the regional needs<sup>1</sup>; in the region of Skopje, as the most densely populated, variety of healthcare services is provided through a number of secondary and tertiary healthcare facilities.

The healthcare system is comprised of public preventive health care which is organized through the following entities:

- The network of Institutes of Public Health,
- 10 public health centres with 21 District Institutes of Occupational Medicine,
- Preventive teams within the 34 health centres,
- the Institute for Health Protection of Mothers and Children and
- the Institutes for Mental Health in Skopje and Bitola .
- 12 institutes at the Medical Faculty,
- Institute of Transfusion Medicine,
- 4 health stations,
- 56 clinics,
- 95 laboratories and
- 843 pharmacies.

There are 3421 registered Healthcare facilities, out of which 2257 in the private sector (leased and/or independent private practice).

The public hospital healthcare sector encompasses 29 university clinics (within the University Clinical Centre), 3 Clinical, 14 General, 12 Specialized hospitals; in addition, there are 6 offices, rehabilitation centres and outpatient facilities, and 9 dispensaries within the healthcare homes. The primary healthcare is provided through a network of PHIs; the public health system is also extended to a network of Institutes for Public Health.

The inpatient capacity (both public and private) is presented by 9339 beds, or 4.6 beds per 1000 inhabitants. Out of the total number, 276 beds are available in private hospitals that count for a share of 3.5%.

The total bed occupancy rate is 64%; around 2 / 3 (or 6561 beds) are used for short-term hospitalization of patients with acute conditions. The remaining 1/3 of total

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<sup>1</sup> The country is divided in eight statistical regions. The organization of healthcare services integrates the regional principles.



available beds (2499) are used for longer-term stay, out of which 1163 beds are intended for mentally ill patients, while the rest are used for persons that require an extended treatment.

## 2.2 Current Organization of the HCWM System and statistical data

The current practices do not incorporate to a full extent the main principles, and they are not supported with adequate protocols and Standard Operating Procedures (SOP's). The HCWM in all visited hospitals is not based on operative plans, and consequently there isn't any specific responsibility allocated to the staff that gets into contact with the hazardous stream of the healthcare waste. HCW is usually managed by the operative personnel who are primarily engaged in performing healthcare services. All issues that are arising from the poor waste management are resolved with ad hoc solutions, and there are no sustainable solutions either, preventive or proactive measures or practices.

The segregation on a basic level exists; however, all waste streams are mixed during the collection, and disposed off without any treatment at the municipal non-compliant landfills.

Three basic waste streams are segregated: hazardous (mainly infectious) waste sharps and non-hazardous. The law, however, requires waste segregation as per the streams defined in the List of Wastes and their further packing and labelling. During the site visits, it was noticed that during the segregation, non-hazardous streams ended up in the containers intended for the collection of infectious waste, and vice versa.

There are poor practices for spillages management, and no SOP's or spillages kits. Almost all PHIs have problems with disposal of the mercury from broken thermometers. The mercury is improperly collected from the spillage, and then disposed in either the sewerage or communal or healthcare waste stream. Somewhere it is kept in small bottles with water without having solution for collection or disposal. There are no standard operating procedures, no spillages are reported, and spillage kits are not available.

Improvisations are common, especially with regard to the sharps management, which increases the risk of injuries and contamination. The recapping is a standard procedure and there are no proper sharps containers. Sharps accidents are present, but not reported properly. Although all healthcare workers and managers are aware of this problem, there is no standard protocol for reporting of sharps accidents, and there is no programme for replacement of the currently used sharps with safe sharps, designed items or proper sharps containers. According to ROSA<sup>2</sup> analysis report 2008 (Healthcare Waste Management Training – REC Project funded by DEFRA) the healthcare workers reported an average of 1,42 accidents per person in four hospitals, in 340 returned questionnaires out of 400 distributed. It is vice to mention that the healthcare workers are basically more exposed to the sharp injuries because

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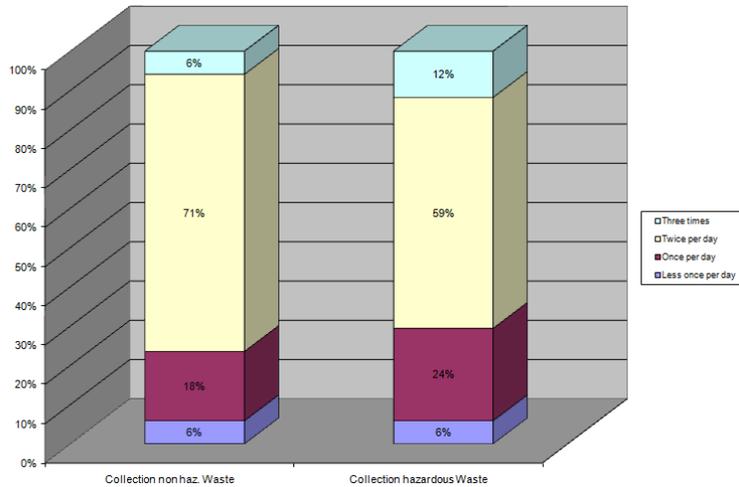
<sup>2</sup> Rapid Onsite Assessment Tool for obtaining information about the HCWM situation in the PHI from the employees (healthcare and non-healthcare) workers from different vocations

of their occupational activities, but significant amount of sharps injuries were reported by Cleaners (11%). This may be prevented only by introduction of safe sharps management system.

Staff	Number of Questionnaires	Total Accidents	Accidents per Staff	%
Student Doctor	3	9	3,00	2%
Doctor	11	25	2,27	6%
Specialist Doctor	46	29	0,63	7%
Nurse	154	188	1,22	46%
Nursing staff	41	69	1,68	17%
Main Nurse	24	12	0,50	3%
Midwife	13	6	0,46	1%
Cleaning	23	43	1,87	11%
Med/Lab Technician	20	23	1,15	6%
Tech. Dept	1	1	1,00	0%
Administration	4	1	0,25	0%

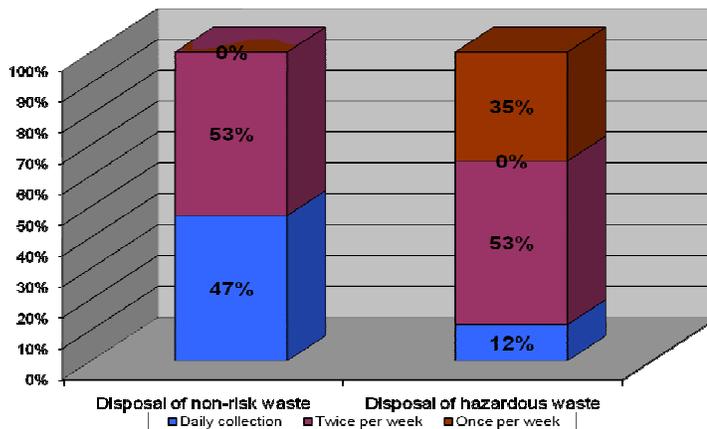
Also, internal movement of waste is performed using improvised trolleys, sometimes it is transported in elevators used also for transportation of food; the conditions in internal storage areas are often inappropriate. At the central storage points, there is a clear division on hazardous and non-hazardous; the technical standards are, however, not adequate.

Internal waste collection practices differ throughout the visited HPIs. In the figure below some statistics of the collection frequency are presented.



In some visited HPIs, the HCW is kept at the generation and/or storage points longer than required. All these practices will have to change and harmonize once a common national system is in place.

The external transport for disposal is performed by public companies; however, the vehicles do not fulfil the basic requirements for transport of hazardous materials. In the figure below, some statistics on the external collection frequency are highlighted.



The HCW is usually disposed in regional dumpsites or landfills without proper treatment. It poses potential hazard for the waste scavengers and landfill workers. In Skopje, the HCW is incinerated in an old and improper incinerator. The HCW that is incinerated is from all PHIs in Skopje and some PHIs from Kumanovo.

According to the National legislation, record keeping and reporting procedures on waste management by all is covered by the “Regulation on the format and content of the journal for records keeping on waste handling etc.”, No. 07/2006. The authorities receive constant updates and reports from PHIs from Skopje and Kumanovo, due to the reason that only in these two cities the HCWM system is managed, including final treatment and disposal. Other PHIs have not submitted to the authorities reports on waste generation and management.

In overall, the HCWM poses significant risk for the healthcare workers, patients and visitors of the PHIs in the first line. There is lack of awareness of the risk of improper HCWM between the healthcare workers, especially in consequences for the environment that may derive from poor disposal practices of hazardous materials.

### 2.3 HCWM Stakeholders

Healthcare waste management in Macedonia falls within the remit of three ministries, Health, Environment and Agriculture (for the veterinary waste which has similar properties as the healthcare waste).

The development and formulation of policies, drafting and law enforcement in the area of the HCWM is shared between several ministries: Ministry of Environment and Physical Planning (MOEPP), Ministry of Health (MOH), Ministry of Agriculture, Forestry and Water Economy (MAFWE) and the Ministry of Transport and Communications (MTC).

A number of inspection units, operating under the mentioned Ministries (State Sanitary Inspectorate - Ministry of Health, State Environmental Inspectorate - Ministry of Environment and Physical Planning, State Veterinary Inspectorate - Ministry of Agriculture, Forestry and Water Economy, also conducts supervision / inspection.

Public communal companies in accordance with signed agreements usually collect the waste from all PHIs. The public communal enterprises do not possess sufficient capacities for separate collection, transportation, treatment and disposal of communal and hazardous wastes. As a result, the hazardous waste is usually improperly disposed.

An exception is the system that functions in Skopje: the HCW is collected separately, and incinerated at the “Drisla<sup>3</sup>” incinerator.

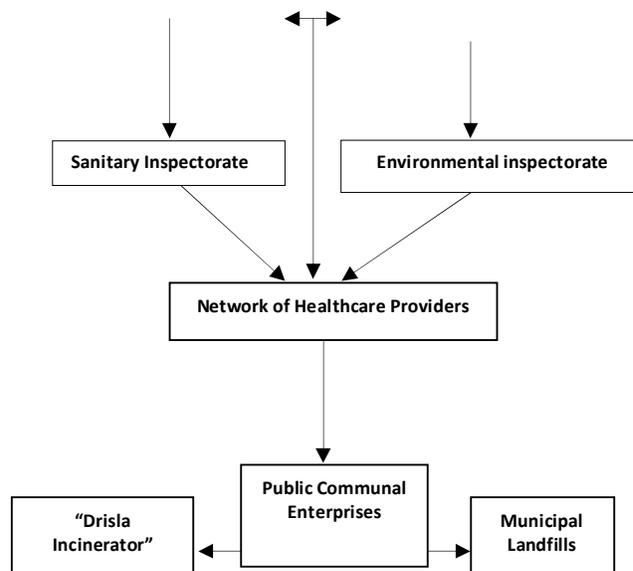
The present organization of the HCWM is given in the following diagram.

Ministry of Health

Ministry of Environment  
and Physical Planning

<sup>3</sup> “Drisla” is the name of the regional landfill that serves the disposal of wastes collected in the Skopje region.





The present institutional capacity for performing policy formulation, monitoring / inspection, record keeping, reporting and enforcement of the legislation is relatively low at this point of time. There is a need for improvement of communication between the mentioned supervising bodies, due to the split of responsibilities in the laws. In order to enforce the existing legal responsibilities, there must be solid cooperation.

### 2.3 Legislation Applicable to HCWM

The transposition of the EU requirements in the National legislation on waste management in Macedonia is progressing well. The implementation and enforcement of laws is however, lagging behind.

Although, the legal framework that regulates the waste management, including hazardous waste management, is fairly developed, there is insufficient capacity among the management of the PHIs and healthcare workers for its practical implementation.

Waste generators on one hand, and waste management service providers, on the other, do not implement sound planning with the aim of improved practices.

In general, the waste management in the PHIs is on basic level and it is not seen a priority. The HCWM is usually considered as part of the infection control and general hygiene, and not as an important everyday practice. There are few PHIs where the main principles of waste management (Reduction, Reusing and Recycling) are implemented for particular waste streams, however further improvement in the organization is required.

To this end, the waste management should strengthen for all operational chains such as the segregation, transportation, treatment and disposal. Particularly, the improvements are required with regard to implementing the waste hierarchy principles.

Health-care waste includes all the wastes generated by medical activities. It embraces activities of diagnosis as well as preventive, curative and palliative treatments in the field of human and veterinary medicine. In other words, health-care waste is all the waste produced by a medical institution (public or private), a medical research facility or a laboratory.

The National legislation (OGRM No. 100/05; OGRM No. 146/07) is defining the waste streams arising in the Healthcare sector, and is in accordance with the Basel Convention on the Control of Trans-boundary Movements of Hazardous Waste and their Disposal (December 2002).

Due to the fact that the national legislation is in coordination with EU recommendations, the above mentioned waste streams are regulated and categorized in accordance with section 18 from the European Waste List.

Radioactive waste is regulated with the National Law for protection from ionising sources and radiation safety (OGRM 48/02, 135/07 and 154/10), and numerous sublegal acts and directives. The National Agency for Radiation Safety has the jurisdiction for supervision and approval of all activities related with radioactive materials.

## 2.4 Hospital Waste Management – Risks from the Healthcare waste

All individuals exposed to hazardous HCW are potentially at risk of being injured or infected. They include:

- *Medical staff:* doctors, nurses, sanitary staff and hospital maintenance personnel;
- *In- and out-patients* receiving treatment in health-care facilities as well as their visitors;
- *Workers in support services* linked to health-care facilities such as laundries, waste handling and transportation services;
- *Workers in waste disposal facilities*, including scavengers;
- *The general public and more specifically the children* playing with the items they can find in the waste outside the health-care facilities, when it is directly accessible to them.

The Authorities and PHI Management show commitment in the implementation of adequate procedures, to minimise the overall risks associated with HCW management. The recommended waste management and treatment options should have the main goal to protect the health-care workers and the population, and in the same time minimise indirect impacts from environmental exposures to HCW.

It is a constant risk during handling of the wastes; the medical and non-medical staff as well as the hygiene workers can be injured if the waste has not been packed and transported properly. In that respect, sharps are considered as one of the most dangerous categories of waste. Many injuries occur because syringe needles or other sharps have not been collected in sharp containers, or because these have been improvised. It is important to know that the sharp does not need to be infected by pathogens to act as direct vector for infection, because the sharps accident (needle sticks, cuts, scratches...etc) are destroying natural barrier, and open up an access for the pathogens to enter the organism indirectly. It is imperative to handle (collect, pack, label, treat, transport and dispose) the sharps with great care, because scavengers are exposed to sharps accident during their recycling activities in the landfills, and can get infected or harm their health indirectly.

The public can be infected from HCW either directly or indirectly, through several routes of contamination. Disposal of HCW in open dumpsites can have major adverse effects on the population and the environment. Waste scavengers, animals, rodents, birds and insects may also be considered as potential vectors for transmission of diseases. Usually, it is very difficult for the epidemiologists to find the source of infection transmitted through the waste, especially if the origin of the waste cannot be identified. Improper disposal of cytotoxic and cytostatic materials with confirmed multiple hazards (teratogenic, mutagenic, carcinogenic, toxic...) can be considered as very dangerous for the human health and environment, and may result with huge impacts. There is also a risk for public health as regards the resale of recovered obsolete or outdated pharmaceuticals in the black markets. The improper disposal of obsolete or not used pharmaceutical waste in waste or sewerage can have severe impact on the environment, especially the release of antibiotics in the environment. The disposal of pharmaceutical waste from the public may be a serious issue. The release of materials with heavy metals content (photo chemicals from X-Ray departments) can have huge environmental impact. Release of mercury into the waste water system can result with huge and long lasting impacts on the environment and health. The release of other chemicals used in the PHI for their daily procedures and services may also present huge impact on human health and environment, if the disposal is not performed in accordance with the actual legislation and prescribed MSDS (Material Safety Data Sheet) by the manufacturer. Mercury, or its compounds as one of the most toxic substance, if released improperly, especially in the water stream, ultimately accumulates in lake or river bottom sediments. There it is transformed into its more toxic organic form by effect of microorganisms, methyl mercury, which accumulates in fish tissue, and can cause significant impact with long lasting effects on the complete bio system. If mercury spillage is not properly contained, it has severe and very long lasting impact on human health.

By reducing or eliminating the improper disposal of chemical waste through sewerage, the impact of the corrosive effect on the sewerage pipes and infrastructure will be significantly reduced.



## CHAPTER 3 SKILLS, COMPETENCES AND TRAINING OF INVOLVED PERSONNEL IN HEALTH CARE WASTE MANAGEMENT

### 3.1 Required Skills & Competences

The Consultant contacted and appointed meetings with the Authorities and responsible persons for healthcare waste management in selected healthcare facilities in R. Macedonia. They have been informed about the project and project purpose. At the meetings the respondents provided information on the current HCWM system in their facilities and answered the project questionnaire. They all showed interest in future cooperation and offered their support for the project. They also agreed that all of the topics that were presented are of significant value and they should all be taken into account in the development of the future training programs.

### 3.2 Training Programmes Available for Health Care Waste Managers

According to the National Legislation, each legal entity that generates more than 200kg of hazardous waste or more than 150 tons of non-hazardous waste is obliged to prepare a waste management programme and nominate or contract out a certified waste manager. The waste manager should hold a certificate for a passed training course and a certificate for a passed exam in order to be able to perform the duties as a waste manager.

Based on the above requirement, the healthcare facilities are in a need to establish a waste management program and to have a waste manager in their facilities. There isn't any requirement to employ permanently a waste manager; however, most institutions have already nominated persons who are acting as waste managers. It is important to mention that the waste management position is not official, but rather appointed as new duties to the existing employee. There are few examples where the healthcare institutions have outsourced a licensed waste manager to prepare a waste management program and to take over the waste-related data collection and reporting responsibilities.

### 3.3 National Qualification Framework – Nationally Accepted Qualifications for Waste Managers

In 2012 the Ministry of Environmental protection and physical planning of the Republic of Macedonia has selected and permitted four training centres that can organize and provide training for waste managers. The training program for waste management is realized in a total of 50 training hours. During the training the Laws for waste management, packaging waste, batteries, WEEE and accompanying sub-legal acts are considered and worked through. Besides mentioned, a lot of attention is focused on the Environmental legislation, in particular the IPPC licensing. All training is supported by some practical examples, relevant for the candidates, and special attention is given on the preparation of reports and reports forms as well as the preparation of waste management programs and plans.



At the end of the training the candidates are obligated to do the exams, which are evaluated by nominated commission by the Authorities and Regulatory bodies, and if passed the candidate are awarded with certificate for waste manager approved by the Ministry of Environment. The certificate is valid for candidate to perform the duties of waste manager for all waste streams (solid, liquid, hazardous and non hazardous) and is valid for all waste management operations (collection, transport, transfer, treatment and land filling).

### **3.4 National Occupational Standards for Waste Management Qualifications (Healthcare Waste)**

The healthcare waste management as topic is included in the training programme with few classes, as elaborated before, just taking into account the existing legislation. The training materials for Healthcare waste management do not have examples for practical implementation.

The training is directly focused on legislative requirements for Healthcare waste management on segregation, packing, storage, treatment and disposal. Colour coding is regulated within the legislation as well as the packing and labelling. Transfer and treatment options are also regulated as well as the disposal options.

Beside the legislation, the trainings do not include in particular practical recommendations on setting up of sustainable HCW management plans. The training does not go into the details of the practice, since these training materials are used for candidates from different industries.

## **CHAPTER 4 REMARKS – CONCLUSIONS**

In addition to the above presented situation and organization of the healthcare waste management in the country, the overall opinion is that the situation has been improved in the last 5 years, however it still poses variety of challenges on all levels. It is necessary to mention that the Authorities and the Regulators have realized the need and accepted to support the project, based on the actual need for improvement of the healthcare waste management.

Based on the fact that waste management cannot be observed as a single discipline that gathers all industries, due to the complexity and variety of waste types that are generated and it is obvious that specific or precise approach for facing the challenges in the waste management sector will be needed in the near future. It is also necessary to take into account the parallel development of technologies for recycling, recovery, treatment and disposal of the waste.

In order to face the challenges and to improve overall waste management system, beside appropriate technology and logistics, human resources are recognized as crucial and mandatory requirement. This project may set up the platform for future development of waste management professionals and professional network on national and international scale.