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

DEVELOPING AN EU STANDARDISED APPROACH TO VOCATIONAL QUALI□CATIONS IN HEALTHCARE WASTE

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EACEA Education, Audiovisual & Culture Executive Agency

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CHAPTER 1 EXECUTIVE SUMMARY

During the period April –May 2014, 5 healthcare facilities have been audited by the REC COM. The consultant considered that is important to avoid auditing primary healthcare and cover facilities on secondary and tertiary healthcare level, due to complexity of operations.

In total five healthcare providers were selected for the purpose of the survey for collection of necessary general information for the HCP, the Organization of the HCWM, frequency for collection and disposal, information about the in house treatment and expenses for the HCWM system. The questionnaire was filled in with information from the person that is appointed by the HCP management to coordinate the HCWM or hospital hygiene; the Head nurse, IC Nurse, the sanitary technician or the waste manager were mostly nominated to oversee HCWM practices.

Beside the onsite audit, extensive desk research of available data from previous projects and research in healthcare waste management field was performed. By reviewing of the executed feasibility studies on the set-up of the regional MSW management systems for NE & CE Macedonia (Associated Consultants: DHV Prowa-SWC, EU funded project managed by EAR, Ref. No.: DGIUGLARIS097-CARDS-EAR-SK, 2005) and SW Macedonia (KfW, P1471, Sept. 2002) as well as the set-up of the medical waste management system (Grontmij CarlBro, EU funded project managed by EAR, CARDS Healthcare Risk Waste management, Ref. No. EuropeAid/123728/D/SER/MK, 2007), valuable inputs was brought for development of this report with regard to the establishment of institutional, organisational and technical infrastructure for the Solid and Healthcare waste management. Also the feasibility study for Feasibility Report Proposed Project for Rehabilitation of Health Provider Institutions in Republic of Macedonia, produced with the technical assistance by the EU funded project Infrastructure Project Facility (IPF) implemented by COWI-IPF2 was taken into account due to the fact that it contains complete EIA for the proposed reconstruction activities and Recommendations for the Healthcare waste management plan. It is vice to mention that the Ministry of Health have already considered all Environmental and Waste management recommendations in the ongoing projects for reconstructions of the hospitals in Republic of Macedonia.

CHAPTER 2 OVERVIEW OF THE HEALTH CARE UNITS AUDITING PROCEDURE

2.1 General description of the Health Care Units been audited

By doing the Site visit, the Consultant has visually checked and compared the present practice with the information requested in the questionnaire, namely, a detailed overview of the quality of segregation, sharps management, hygiene conditions and issues, have been assessed, including also the maintenance of infrastructure, conditions of the secondary logistics equipment, function of the internal logistics etc. One of the main objectives of the site visit was to assess the OHS (Occupational Health and Safety) conditions and handling of hazardous materials and wastes. The Consultant established a direct contact with the employees and collected information about the routine and the implementation of the national legislation in practice. During the site visit the Consultant collected data and documents, related with HCWM, from the HCP needed for the data processing.

The Consultant has reviewed and analysed collected data from the visited HCP's on the waste generation quantities and costs incurred for waste management, , including the supply of secondary logistic equipment, transport and waste disposal. The Consultant also reviewed waste collection, transportation and disposal related Contracts which HCPs concluded with the municipal utilities and / or specialised waste handling companies. Apart from the waste generation analyses, and in view of the lack of any measuring of amounts of generated chemical and pharmaceutical waste, the consultant asked for data on supplies concerning photo chemicals, Formaldehyde, Xylol, Toluene, Methyl alcohol etc.

In the process of data assessment, the Consultant also used information provided by the Authorities from mandatory reports from the HCP's and information from previous projects.

2.2 Statistical data on the findings of the audits

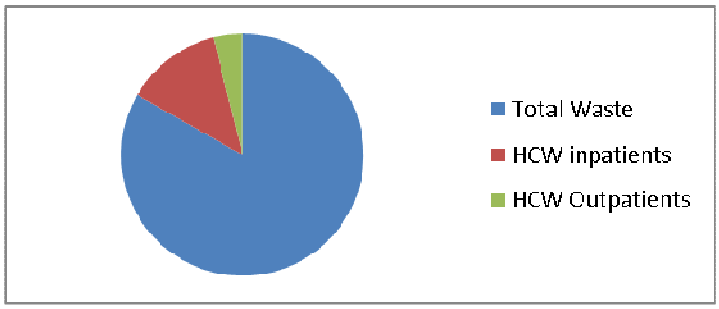
Main focus was on the public healthcare facilities, because public healthcare facilities represent 85% coverage in the country. Primary healthcare facilities were not directly taken into account. All of the audited healthcare facilities have their outpatient service and ambulances, where the number of outpatients can be 3 times higher than the actual number of inpatients per day. For the waste generation calculation, standard WHO approach was used, taking into account total number of beds (inpatients) and increasing it for 30% for the waste generated by outpatient medical service.

The table below summaries the audited facilities (all located in the Capital Skopje), taking into account the Bed Occupancy rate and average length of stay.

	Healthcare Facilities Audited					
No	**Name of HCF**	**Number of Beds**	**Type**	**BOR**	**Avg. LOS**	**HCW per day (kg)**
1	University clinic for gynaecology and obstetrics Centre	194,00	Specialist Clinic and delivery unit with neonatology	85%	4 days	51,99
2	University clinic for children's diseases Centre	240,00	Specialist Clinic	80%	6 days	96,72
3	University clinic for radiotherapy	136,00	Specialist Clinic	80%	5 days	78,18

	and oncology Centre					
4	City hospital "8th September" karposh	285,00	General Hospital	85%	6 days	114,86
5	University clinic for infective diseases and fibril states Centre	129,00	Specialist Clinic	90%	10 days	51,99

As indicated on the graph it is clearly visible that the main waste amounts are generated from the medical services and actions performed on the inpatients.



It is important to mention that all institutions use the service of Public Communal Enterprise (PCE) "Komunalna Higiena" for collection and transport of the HCW; the incineration of the HCW is performed by the PCE "Drisla". It also operates the municipal landfill in Skopje. At the moment the City hospital 8th September is in process of design and erection of a HCW treatment unit that will be donated by the Japanese Government. The waste treatment equipment will be used for treatment of the waste that is generated by the City Hospital only.

2.2.1 Findings from the Questionnaire HCW Manager

All the interviews it was confirmed that the directors are responsible by the law for healthcare waste management in healthcare facilities; at an operational level, though, each facility appoints or delegates to a specific person the management of healthcare waste.

The manager is in charge to manage the waste flow in the facility and to report to the authorities and the Committee for infection control. The manager, together with the infections control nurse are setting and monitoring the health and safety procedures inside the hospital.

Below a summary of the answers to the questionnaire is provided.

Q.1. What qualifications do you currently hold?

All interviewed persons who perform duties of a HCV manager are medical nurses or sanitary technicians. They have been selected from the present staff to take over the HCWM responsibilities.

Q.2. How long has you held the post of healthcare waste manager?

Each hospital that produces over 250kg hazardous waste annually shall appoint a HCW manager. According to the job systematisation of the healthcare facility the head nurse or sanitary technician is usually appointed as a HCW manager.

Q.3. How was your current post advertised and what were the requirements for the post?

The job of a HCW manager is posted through an internal appointment, or a suitable person is simply nominated to replace the previous HCW manager; thus this job is not filled in under any public job announcement. A HCW manager may be a sanitary engineer or can possess similar technical / healthcare knowledge.

Q.4. Do you have a job description and/or contract of employment? May we have a copy of the job description?

Specific duties of a HCW manager are:

- Main activities are: waste management, disinfection, pest control, clean water, wastewater, hospital external space management, and cleaning and transport system. In addition, the HCW manager will take over the following duties:
- Cooperation with the infection control committee in setting of guidelines for waste segregation / collection / temporary storage, before wastes are taken over by the licensed contractors;
- Organisation of trainings of other staff involved in HCWM as well as monitoring and developing suitable guidelines;
- Organisation of supplies of material for waste collection/ logistics.
- Preparation of reports on waste generation and handling as well as reporting to the Authorities.

Q.5. What type of training, if any, did you receive from the hospital when you first started in this job as healthcare waste manager?

Since 2007 waste managers are certified by the MOEPP after attending training provided by an authorised training centre and successfully passing an exam. Interviewees attended different courses and some of them were trained by an authorised training centre. Regardless of the type of received training, HCW managers also receive in-house training which is provided or organized by the head nurse:

- Infection control and hand hygiene
- Professional hygiene (personal, patient and environmental)
- Segregation, labelling and packing of the waste
- Occupational Health and safety

Q.6. Does your employer provide training opportunities for you and if so in what subject areas and how often do these training events occur?

Training opportunities are supported and allowed by the management of the healthcare facility. In last few years an effort has been made for provision of continuous training for infection control, sterilization and disinfection that are performed at least 4 times per year. Trainings for introduction of new technologies and practice are not a part of any continuous learning programme.

Q.7. Do you provide training or awareness raising in regard to healthcare waste management issues at your healthcare facility and if so to whom, on what subject areas and how often does such sessions take place?

The HCW manager works on awareness raising by delivering various trainings and developing specific guidelines, in tandem with the committee for infection control and head nurse. They target the medical and support staff.

Additionally, trainings are done for new employees or when some problems/issues are noticed in the practice. Refreshing trainings are organized from time to time (not scheduled).

Q.8. Do you follow a formal Continuous Professional Development (CPD) programme? If yes, when did you last formally update your skills and knowledge in terms of that CPD programme?

Due to the fact that majority of the HCW managers have a medical background, while the HCWM constitutes only part of their job description, they are more often following CPD in accordance with their main profession. There are no CPD in waste management established in the country

Q.9. Please take a look at the list of units that are proposed in Appendix 1 for a new EU-HCWM VET (Vocational Education and Training) Award. Please indicate the units which are most relevant in your opinion to the post of healthcare waste manager.

The interviewers considered that the list of units covers overall waste management.

Q.10. Are there any areas of your role as healthcare waste manager which are not addressed by the list of units? If yes what areas are they?

- Practical guidelines,
- Standard operating procedures
- Accidents management

2.3 Hospital Waste Management of specific materials

Infectious waste

Beside the actual audit the consultant has also performed desk study of available documents and data related with the HCWM in the country.

It is estimated that about 35% of the total amount of hazardous waste from healthcare institutions in Macedonia is incinerated, according to the NWMP 2009-2015 and the assumption is that the total amount of HCW in Macedonia is around 1200 Tonnes per year that corresponds with figures from the National Survey.

The situation is very different from Skopje and Kumanovo and the rest of the country where the HCWM system is on lower level. That is due to the fact that the HCP form this cities have signed contract for incineration of the generated HCW at the Drisla landfill in Skopje.

None of the assessment and analysis includes amounts that are generated in the private healthcare sector. In Macedonia there are 167 public HCP's and 3254 private HCP's. It is necessary to mention that the private healthcare is not consisted out of big HCP, but rather small healthcare service organisations and accordingly the amounts of HCW are far smaller than in the public healthcare sector.

The waste that is generated in the Veterinary healthcare is also not part of this assessment. For the analysis and assessment of the veterinary healthcare, more detailed analysis will need to be performed in the future and must establish direct compliance with national regulations for HCW management.

Lately there is indicative by MOH to establish 8 Regional Healthcare waste treatment centres that will be responsible to treat the infectious waste from the regional healthcare facilities. Beside that setting up of new hazardous waste incineration plant on Drisla landfill, with capacity of 200kg/ hour is planned.

Pharmaceutical Waste

The Consultant has concerns about the current management of the other hazardous waste streams (pharmaceuticals, chemical, Mercury) originating from observations during the site visits. Currently there are no evidences or data on the disposal and amounts of the mentioned waste streams and the only way to assess the generation of these waste streams is to address the supply chain and the usage of the specific hazardous materials. Due to the effective supply chain there are very small amounts of this waste stream that needs to be controlled. However this waste stream can be some time considered as very hazardous, having in mind, the impact of not controlled disposal and releasing of antibiotics in the environment and biodiversity.

All though the National legislation for pharmaceuticals and chemicals is harmonized with EU regulations trough the National Agency for Medicinal Products, there are not enough local capacities for treatment and disposal of pharmaceutical and chemical waste.

Similar as the situation with the Infectious waste stream, the situation is different between Skopje and rest of country. In Skopje HCP's the pharmaceutical waste is usually disposed same as infectious stream and incinerated, while in the rest of the country is disposed via sewerage or landfills and dump sites. Hormones and pharmaceutical compounds in the water may be responsible for effects on wildlife including feminization of male fish, sluggish activity or reduced appetite.

By disposal of the pharmaceutical waste on not engineered landfills, certain contamination of the leachate may be expected. The Landfill leachate can contain trace amounts of pharmaceuticals and if the leachate is not treated may significantly increase pollution of surface water and ground water.

The consultant does not address disposal of pharmaceutical waste by excretion, but only by direct disposal via sewerage or waste on the landfills by the HCP institutions.

As mentioned before, the generation of the pharmaceutical waste are not significant due to the effective strategy of the supply chain in the healthcare system and very rarely some drugs are kept without usage beyond their shelf life. It was not reported by the HCP's existence of significant quantity of obsolete pharmaceutical waste. However the Consultant noticed that the unit dose pack (vial, ampoule, blister...) of the pharmaceutical is not considered as pharmaceutical waste and usually is not disposed properly.

When considering generation and disposal of pharmaceutical waste, the Consultant is concerned of the pharmaceutical waste generated in the public due to the fact that there is no organized system for collection of the same (organized return at the pharmacies). Usually these amounts can not be determined nor assessed precisely. These pharmaceutical waste amounts are bigger than the amounts generated in the HCP's and are usually directly disposed in the communal waste and wasted dumps and landfills. However this was not a part of the assessment.

Cytotoxic Waste

Special attention is not addressed to Cytotoxic waste and the multiple hazards that are associated with this waste stream are constantly present and posing great risk because of the poor risk control measures. Cytotoxic and cytostatic medicines are medicines that are either: toxic, carcinogenic,

mutagenic or toxic for reproduction. During the assessment and site visits, the Consultant had the primary focus of safety of working with cytostatic drugs and cytotoxic waste:

Control of the working environment;

Safe work practices; and

Education and training of personnel.

The preparation and reconstitution of the chemotherapy drugs is performed by specially trained nominated personnel, however the working conditions are posing huge health hazard because they are not enough equipped with safety cabinets to protect workers and the environment as well as protecting the integrity of the prepared chemotherapy. There are reported cases of healthcare workers affected from the chronically exposure on the hazards of the Cytostatics.

There are three oncology clinics in Skopje, Bitola and Stip and future in Clinical hospital in Tetovo. The Cytotoxic waste from Skopje is incinerated and the waste from Bitola and Stip is disposed in the infectious waste stream on the local landfills from where is to be expected that the leachate from the cytotoxic waste will end up contaminating the surface and ground water.

The Oncology clinic in Skopje is one of the biggest generator of this waste stream. The average outpatient flow at the chemotherapy unit is average 120 patients per day.

Chemical Waste

According the National Agency for Medicinal Products, there are more than 200 hazardous chemicals classified on the National list and used in Macedonia for various purposes. Most of these are in everyday used in the healthcare sector for various services. The biggest generators of this waste stream in healthcare system are laboratories, pathologies and X-ray departments (photo chemicals).

The situation with disposal of the chemicals is concerning because most of them are disposed via sewerage and corrosion and deterioration of the sinks and sewerage pipes are clearly evident. This activity cause huge impact and lots of problems with the infrastructure, especially water supply and waste water system. However, the Consultant noticed few cases where the chemical waste is not disposed, but stored, in best intention, but improperly in improvised condition, directly influencing the personnel health.

Same as the situation with pharmaceutical waste, elaborated before, the generation of chemical waste can be assessed only by addressing on the supply chain. The consultant collected some information from the generators, regarding the yearly supply of the chemicals. As example, the Medical faculty for the Institute for Pathology, purchases Formaldehyde with in average of 1000 litres per year. This is amount is used for everyday work and usually is disposed via sewerage. Rough estimation is that approximately 3000-5000 litres are used in the public HCP in one year. Almost 90% are disposed via sewerage and the rest in landfills, because there is no program for collecting and solvents recycling or recovering.

Photo chemicals are usually disposed via sewerage, all though there are situations where they are collected by third party for silver recovery. Usually only the fixer is collected due to the high

concentration of silver inside. It is important to mention that almost 90% of the imaging equipment is digitalized or using dry film processing. This is a trend that is in process and is estimated that in the next 5 years there will be less than 1% of wet X-ray film processing equipment in the public health facilities.

Radioactive Waste

The radioactive waste is mainly generated in the University Institute for Pathophysiology and Nuclear Medicine and in the University Clinic for Radiotherapy and Oncology, both located in the premises of the Clinical Centre in Skopje. In the practice of the Institute usually Iodine-131 (131I) and Technetium-99m (99mTc) are used. Both of the elements are with relatively short period of radioactive decay half-life, for 131I beta and gamma emissions are half-life is 8 days and for 99mTc gamma emission half-life is 6 hours. The mentioned isotopes allow scanning procedures which collect data rapidly, but keep total patient radiation exposure low. The current practice is that the waste materials used for administration of mentioned isotopes are considered as a radioactive waste and are stored until the decay half-life of the waste is confirmed as “radiation safe” and then is disposed as infectious waste and incinerated. The current storage conditions are poor and improvised, not suitable for radioactive waste. Lead containers (radiation proof) are used as storage. The old storage is out of order and the Institute has prepared project documentation and EIA study for new underground storage of this waste stream. The OHS issues are respected however there is a need for improvement of the infrastructure conditions in regards to radiation safety. The Institute has enforced safe procedures and protocols for materials, personnel and patients flow inside the building in order to increase the radiation safety.

The Clinic for Radiotherapy and Oncology is using Iridium-192 (192Ir), decay half-life 72 days, for brachytherapy procedures and is reported that the Caesium-137 (137Cs), which have 30 years decay half-life, is not used anymore in the therapy. The waste management procedure differs from the procedure in the Institute. The sources that are considered obsolete and redundant are collected by the supplier of and everything is reported and controlled by the State Agency for Ionisation.

Mercury

Mercury is a metallic element that occurs naturally in the environment. There are three primary categories of mercury and its compounds: elemental mercury, which may occur in both liquid and gaseous states; inorganic mercury compounds, including mercurous chloride, mercuric chloride, mercuric acetate, and mercuric sulfide; and organic mercury compounds If released improperly, especially in the water stream, the Mercury ultimately accumulates in lake or river bottom sediments, where 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.

As one of the most toxic substances used in the health care, Mercury that can be found in the thermometers, sphygmomanometers, dental amalgam, fluorescent light bulbs & medical batteries. The impacts of Mercury on human health are long lasting and cumulative.

Mercury is highly toxic, especially when metabolized into methyl mercury and it may be fatal if inhaled and harmful if absorbed through the skin. Around 80% of the inhaled mercury vapour is absorbed in the blood through the lungs. The Mercury in direct contact can pass through the skin and it is proven that indirectly can pass to unborn children via their mother's blood.

The Consultant notice that there is no evidence of accidents (Spillages of Mercury) and there is no safety or emergency protocol in regards of dealing with mercury spillages. It was indicated on the site visits that a lot of mercury devices have been replaced by adequate and not potentially hazardous, but however it was noticed that a lot of other mercury containing devices and sources were still present and in usage and in all HCP were noticed amounts of obsolete medical equipment and fluorescent lights that are suspected to contain amounts of mercury.

As well as with situation with Pharmaceutical, Chemical, cytotoxic waste, the Mercury require more extensive and detailed assessment and analysis.

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

3.1 Skills – Competences

Most frequently the waste manager is person that is most commonly educated and experienced environmental issues, however for Healthcare Waste manager, in specific the candidate should have technical / biological / chemical and health related knowledge/education (e.g. high graduated nurses, other engineers, etc.).

Most commonly the HCWM are sanitary technicians, qualified and educated in the sanitary engineering field. Sanitary Engineer performs all forms of medical-ecological control, coordinates the sanitary work in the field of drinking water supply and waste management and sewage.

The competency of the sanitary technician includes different knowledge in the domain of medical, ecological, hygienical and epidemiological field. He or She also carries out all forms of medical-ecological control in the areas of preventive health activities, manages and coordinates the activities with public institutions, companies and institutions in the fields of supply of drinking water, food, waste, sewage, hazardous materials, and participates in the control of the hygienic-epidemiological and ecological problems; and carry out professional work in the field of disinfection, disinfestation, rat extermination and decontamination.

3.2 Existing Training on Health Care Waste Management

Ministry of Environmental protection and spatial planning of Republic of Macedonia has developed and published the programme and examination procedures for obtaining status of a waste manager, form of the license and the payment of examination fee (OGRM No. 105/05, 109/05, 133/07, 39/09 and 139/09).

In 2012 the Ministry of Environmental protection and spatial planning of 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 total of 50 training hours, in particular 20 hours of general legislation and regulative for waste management and 30 hours on regulations and procedures for management of specific waste streams

During the training the Laws for waste management, packaging waste, batteries, WEEE and accompanying sub legal acts are considered and worked trough. Beside mentioned, a lot of attention is focused on the Environmental legislation, in particular the IPPC licensing. The 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).

3.3 National Qualification Framework – Award Units

In 2012 the Ministry of Environmental protection and spatial planning of 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 total of 50 training hours, in particular 20 hours of general legislation and regulative for waste management and 30 hours on regulations and procedures for management of specific waste streams

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3.4 Duties and Responsibilities

Here bellow is the recommendation for the duties and responsibilities for the position Healthcare Waste Manager

Responsibilities: Person responsible for organization, supervision, and managing the healthcare waste management in the healthcare facility

Duties: Development, establishment and supervision of comprehensive program for healthcare waste management and including awareness rising and capacity building among the employees

Responsible to: Infection control committee, director of the hospital and authorities (MOH and MOE) and regulatory bodies (inspectorates)

1. Duties and Responsibilities

A) Control and supervision

- Annual revision of the HCWM policy in coordination with the Director, the Committee for infection control and Head Nurse
- Data Collection and analysis on infections and outbreaks that are result of not proper HVW management
- Control and implementation of the equipment for waste management and logistics, Proper usage of PPE, carrying out of regular audits and inspections, supervision of waste management procedures and reporting
- Evaluation of the HCWM system
- Supervision of the personnel responsible for handling of the HCW
- Preparation of quarterly reports on actual HCWM situation and prepare recommendations for improvement

- Supervision of accidents and incidents related with HCW management and prepare report
- Problem identification related with waste management and recommendation of action plan for improvement

B) Training and Capacity building

- Provision of comprehensive training program for segregation, environmental protection, occupational health and safety and managing hazardous materials and wastes
- Develops and coordinate specific training programs for each department related with hazardous materials, policies, activities and regulations related with HCWM
- Controls the documentation for mandatory trainings and education
- Verifying the competence of the employees and their achievements during the training
- Informing the personnel and public about the infection control and HCWM
- Educate new employees and other personnel on HCWM in order to avoid irregularities arisen from lack of information flow

C) Safety and communication:

- Observes all questions related with bio safety with the infection control committee and the OHS responsible
- Controls the programs for spillages management and emergency procedures
- Maintain data on materials safety and coordinate with procurement department about procurement of necessary materials
- Cooperate with governmental and other accredited agencies for provision of licenses and acceptances.
- Gives recommendations for legal, operative, professional and public issues as support to the institution.

Criteria

The person on this working position should:

- Have extensive ability for management, experience in administration works and needs to be able to report on medical and administrative issues.
- Be deeply devoted to infection control and have extensive knowledge in prevention and control of communicable diseases.
- Minimum medical high school education, biochemistry, sanitary or laboratory technician, preferably university education.
- At least 2 years of working experience in related field or in healthcare institution
- Concluded special training program for waste management in an authorised training centre
- To be a certificate holder for waste management issued by relevant institution
- Have ability to lead and train not qualified personnel

- Have ability to face and overcome everyday situation where will be exposed to blood and human tissue of not confirmed infection risk and other hazardous materials
- Prepared not to become emotionally engaged in the difficult situations

3.5 Training needs detected

Due to the fact that HCWM is a very wide topic it is necessary to develop tailor made training program for HCWM. Based on the analysis made in 2008 it was concluded that there is a lack of knowledge in the following segments.

- Organization of Waste management system
- Sharps management
- HCW Accidents response
- Logistics and Transport of hazardous waste

CHAPTER 4 REMARKS – CONCLUSIONS

Ministry of Environmental protection and spatial planning of Republic of Macedonia has developed and published the programme and examination procedures for obtaining status of a waste manager, form of the license and the payment of examination fee (OGRM No. 105/05, 109/05, 133/07, 39/09 and 139/09).

Since 2007 waste managers are certified by the MOEPP after attending training provided by an authorised training centre and successfully passing an exam. Interviewees attended different courses and some of them were trained by an authorised training centre. Regardless of the type of received training, HCW managers also receive in-house training which is provided or organized by the head nurse:

- Infection control and hand hygiene
- Professional hygiene (personal, patient and environmental)
- Segregation, labelling and packing of the waste
- Occupational Health and safety

In 2012 the Ministry of Environment and Physical Planning of 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 total of 50 training hours, in particular 20 hours of general legislation and regulative for waste management and 30 hours on regulations and procedures for management of specific waste streams. 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).

The Head nurse, IC Nurse, the sanitary technician or the waste manager were mostly nominated to oversee HCWM practices

Most commonly the HCWM are sanitary technicians, or qualified and educated sanitary engineering field: The competency of the sanitary technician includes different knowledge in the domain of

medical, ecological, hygienic and epidemiological field. He or She also carries out all forms of medical-ecological control in the areas of preventive health activities, manages and coordinates the activities with public institutions, companies and institutions in the fields of supply of drinking water, food, waste, sewage, hazardous materials, and participates in the control of the hygienic-epidemiological and ecological problems; and carry out professional work in the field of disinfection, disinfestation, rat extermination and decontamination. The job of a HCW manager is posted through an internal appointment, or a suitable person is simply nominated to replace the previous HCW manager; thus this job is not filled in under any public job announcement.

Current training provided to HCW managers is not detailed enough and lacks practical examples. The following issues are not part of either official (provided under the MoEPP certification system) or in-house training in hospitals:

- Practical guidelines,
- Standard operating procedures
- Accidents management

ANNEXES

ANNEX A

ANNEX B

ANNEX C