



"EU-HCWM"

## Assessment and national report of Germany on the existing training provisions of professionals in the Healthcare Waste Management industry



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

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## CHAPTER 1 EXECUTIVE SUMMARY

The carried out audit showed that hospitals introduced the healthcare waste officer system and appointed responsible officers. Generally all appointees received training on waste management prior start of their job and also are provided with opportunities to update and refresh their knowledge. The general education level of these officers can be considered as high to very high. From the point of view of the responsible waste officers, training systems should concentrate on all aspects related on monitoring and controlling of waste management systems, but also overlapping activities such as the management of hazardous goods or waste water management should be included.

Between the different healthcare facilities, normalized waste generation rates differ strongly. Whether this is related to the know-how level of the responsible waste officers is questionable. During interviews it was stated, that especially the position and power of the waste officer and the support by upper management level has a strong impact on the waste management quality in the healthcare facilities.

By carrying out a long-term and state-wide research on specific waste streams, it became visible that in Germany - despite lower hospital bed rates and lower occupancy rates - the infectious waste stream (180103\*) increased strongly during the last years. Also distinctions of the waste generation rate among the different countries exist.



Pic: Hazardous waste and non-hazardous waste function area of a tertiary level hospital in Berlin

## CHAPTER 2 OVERVIEW OF THE HEALTH CARE UNITS AUDITING PROCEDURE

### 2.1 General description of the Health Care Units been audited

The carried out audit was performed in three major steps:

In the first step, the general healthcare waste situation was audited and the statistical data on waste generation rates of four major hospitals in the country of the author were collected and analyzed. Information about waste generation rates and situation are considered as confidential by hospitals in Germany. It was agreed that the data from the hospitals will be anonymous and that, except of the number of beds, a general description and the waste generation rates of the last year, no further information about the hospitals will be published.

In the second step, a sample waste stream was selected to compare the healthcare waste generation rates in all countries of Germany to identify if local or regional differentiations exist. As sample waste stream, potentially infectious healthcare waste (180103\*) was selected. The responsible authorities in all 16 countries were contacted and the waste generation data of years 2010 and 2011 as well as the years 2002 and 2003 were collected (Data from the years 2012 and 2013 were during the research not available from all countries in Germany) and the collected data were analyzed.

In the third step, a national audit of the know-how and capacity of healthcare waste officers was conducted. For this, a standardized questionnaire was send via existing healthcare waste training providers, country level healthcare care waste working groups and by direct contact to about 500 healthcare waste officers throughout Germany. From the contacted persons, 20 replied and send back a filled questionnaire.

### 2.2 Statistical data on the findings of the audits

The audit was carried out in accordance with the Interpretive Guideline for the disposal of waste generated by health-care establishments. According to this guideline, the waste generated by health-care establishments shall be disposed of in such manner that

- the human health and well-being,
- the environment (air, water, soil, animals, plants and landscape) and
- the public safety and order

are not endangered.

Pursuant to the principles of the closed substance cycle waste management, waste

- must, primarily, be avoided, in particular, by reducing its amount and noxiousness,
- and secondarily, be subjected to substance recycling or used to obtain energy (energy recovery) to the extent that it is technically feasible, acceptable in terms of hygiene and economically reasonable and that a market exists or can be created.

Non-recyclable waste shall be disposed of by permanently excluding it from the closed substance cycle waste management without affecting the public interest, in particular, the environment. Changes towards a closed substance cycle waste management require an ecology-oriented organisation from the merchandise procurement to the proper disposal.



The proper disposal of the health-care establishment's waste in accordance with the regulations relates to the on-site and off-site collection, packaging, provision, storage, transportation, treatment, recycling or removal - until its final recycling or disposal. Special requirements in terms of infection prevention, which might be applicable within and outside of the health-care establishment, must be considered.

In order to fulfil the basic duties of the Closed Substance Cycle Waste Management, the health-care establishments are obliged to use all possibilities of avoiding and recycling waste to the maximum extent possible.

The proper disposal requires a practical and manageable handling of the waste and a transparency of the waste flows. Therefore the collection, storage and treatment of waste generated by health-care establishments require a well thought out and controllable in-house/on-site system that is coordinated with the terms and conditions of the external disposal procedures and routes, as

- due to the composition of certain wastes (e.g. material associated with risks of injury, pathogens etc.) safety measures must be taken, in particular, for the staff entrusted with the disposal, and
- in terms of waste management and environmental hygiene, it must be ensured that recyclable materials can be collected and treated separately.

Pursuant to the Closed Substance Cycle Waste Management Act (KrW-/AbfG), different requirements apply to the disposal; they depend on the environmental relevance and the toxicity of the wastes. Accordingly, pursuant to §§ 42 ff. of the KrW-/AbfG in conjunction with the Ordinance on the Furnishing of Proof, a distinction is to be made between hazardous waste and non-hazardous waste.

The hazardous wastes include the types of waste that are marked with an asterisk (\*) in the European waste list. They are always subject to a proof-based procedure (proof of proper disposal and a healthcare facilitying document / proof of proper collective disposal and acceptance certificate). In addition, producers of hazardous waste are obliged to keep registers pursuant to the specified provisions.

Furthermore, pursuant to § 17 of the KrW-/AbfG, health-care establishments have the possibility to found a branch-specific association and assign the association with the execution of the proper waste disposal.

The carrying out of the waste audit showed the following results:

**Hospital A, located in Berlin, University hospital including research**

<b>University hospital - 1300 Beds</b>			
<b>Type of Waste</b>	<b>tons / a</b>	<b>Kg / bed / a</b>	<b>Kg / bed / day</b>
White glass	230	176,92	0,485
Brown, green glass	9	6,92	0,019
Cardboard	220	169,23	0,464
Shredding waste - files	20	15,38	0,042
Organic waste, litter, leaves	200	153,85	0,421



polystyrene waste	1	0,77	0,002
Residual waste	320	246,15	0,674
Hospital waste - 180104 dry	600	461,54	1,264
Hospital waste - 180104 wet	30	23,08	0,063
Ethical / Pathological waste	10	7,69	0,021
Infectious waste	20	15,38	0,042
Cytostatic waste	3	2,31	0,006
Solvent non-halog. / Halogenated	8	6,15	0,017
Mercury-containing waste	0,01	0,01	0,000
Batteries	0,5	0,38	0,001
Waste medicines	0,8	0,62	0,002
Old X-ray films	1	0,77	0,002
Silver from the fixer recycling	0,01	0,01	0,000
Fixing bath - photo chemicals	3	2,31	0,006
Developer solution	3	2,31	0,006
Fluorescent lamps	1	0,77	0,002
Hazardous waste chemicals	1,5	1,15	0,003
Lead	0,05	0,04	0,000
Bulky waste	100	76,92	0,211
Rubble	17	13,08	0,036
Iron scrap	18	13,85	0,038
Monitors - WEEE	4	3,08	0,008
Med.-tech. Equipment / electronic scrap	10	7,69	0,021
Privacy: Ribbons, drives, Disk.	0,2	0,15	0,000
Refrigerators disposal	3	2,31	0,006
Sludges from oil / water separators	4	3,08	0,008
Radioactive waste	0,8	0,62	0,002
<b>Total</b>	<b>1838,87</b>	<b>1414,52</b>	<b>3,88</b>

**Hospital B, located in Berlin, University hospital including research**

<b>University hospital - 1350 Beds</b>			
<b>Type of Waste</b>	<b>tons / a</b>	<b>Kg / bed / a</b>	<b>Kg / bed / day</b>
Lead-acid batteries	1,8	1,33	0,004
Construction waste contaminated	50	37,04	0,101
Aluminium	0,4	0,30	0,001
IRON AND STEEL I	0,5	0,37	0,001
IRON AND STEEL II	180	133,33	0,365
IRON AND STEEL III	1	0,74	0,002
Mixed metals	5	3,70	0,010
Cable	1,6	1,19	0,003
Construction Waste	15	11,11	0,030

Ethical – Pathological waste	8	5,93	0,016
Infectious waste	100	74,07	0,203
Hospital waste 180104 - dry	2511,76	1860,56	5,097
Hospital waste 180104 - wet	7,25	5,37	0,015
Chemicals	39,224	29,05	0,080
Cytotoxic and cytostatic medicines	8	5,93	0,016
Amalgam waste from dental care	0,02	0,01	0,000
Fluorescent tubes	0,4	0,30	0,001
Refrigerators	20	14,81	0,041
Batteries and accumulators	0,85	0,63	0,002
Biodegradable waste	270	200,00	0,548
Mixed municipal waste	8,89	6,59	0,018
Bulky waste	460	340,74	0,934
Old files	125	92,59	0,254
Magnetic tapes	0,4	0,30	0,001
<b>Total</b>	<b>3815,09</b>	<b>2934,69</b>	<b>8,04</b>

**Hospital C, located in Berlin, University hospital including research**

<b>University hospital - 1400 Beds</b>			
<b>Type of Waste</b>	<b>tons / a</b>	<b>Kg / bed / a</b>	<b>Kg / bed / day</b>
Hospital waste - dry	2000	1428,57	3,914
Hospital waste - wet	235	167,86	0,460
Bulky waste	110	78,57	0,215
Animal faeces	140	100,00	0,274
Electrical	60	42,86	0,117
Paper and cardboard	300	214,29	0,587
Mixed municipal waste / recycling	40	28,57	0,078
Mixed metals	50	35,71	0,098
Fixers	5	3,57	0,010
Developer and activator solutions	5	3,57	0,010
Organic halogenated solvents	15	10,71	0,029
Absorbents, filter materials	6	4,29	0,012
Other organic solvents	4	2,86	0,008
Discarded inorganic chemicals	1	0,71	0,002
Discarded organic chemicals	2	1,43	0,004
Discarded chemicals	1	0,71	0,002
Confidential documents	130	92,86	0,254
Body parts and organs	10	7,14	0,020
Infectious waste	3	2,14	0,006
Cytotoxic and cytostatic medicines	10	7,14	0,020
<b>Total</b>	<b>3127,00</b>	<b>2233,57</b>	<b>6,12</b>

Hospital D, located in Berlin, Traumatology hospital

<b>Tertiary care hospital - Traumatology, 550 beds</b>			
<b>Type of Waste</b>	<b>tons / a</b>	<b>Kg / bed / a</b>	<b>Kg / bed / day</b>
Hospital waste 180104 - dry	500	357,14	0,978
Hospital waste 180104 - wet	90	64,29	0,176
Cardboard	80	57,14	0,157
Old files	6	4,29	0,012
Packaging	30	21,43	0,059
Waste glass	12	8,57	0,023
Floppy	0,4	0,29	0,001
Electronic waste	2,5	1,79	0,005
Refrigerators	0,35	0,25	0,001
Formaldehyde solutions	2	1,43	0,004
Solvents, halogen-free	2	1,43	0,004
Cytostatic waste	0,6	0,43	0,001
Ethical / Pathological waste	0,7	0,50	0,001
Infectious waste	0,2	0,14	0,000
Fluorescent tubes	0,4	0,29	0,001
Dry batteries	0,35	0,25	0,001
Resources, with Chem.	0,005	0,00	0,000
Solvents, halogens	0,05	0,04	0,000
Stains	0,2	0,14	0,000
Plastic empty packaging	0,03	0,02	0,000
Laboratory chemicals, org.	0,01	0,01	0,000
Metal empty packaging	0,1	0,07	0,000
Disinfectant	0,05	0,04	0,000
<b>Total</b>	<b>727,95</b>	<b>519,96</b>	<b>1,42</b>

The analysis of the waste generation rates of the hospitals showed strong differences. Further research on the reasons for the differences is needed but out of scope of this project.

### 2.3 Hospital Waste Management of specific materials

During interviews with German healthcare waste officers it was stated several times that due to a reduction of awareness on healthcare waste during the last decade and due to an increased working pressure on the healthcare waste officers and the waste generators (nurse, physicians, etc.) waste generation rates in Germany are increasing. Therefore it was decided to select one waste stream as example to control if this observation of the healthcare waste officers can be confirmed based on statistical data.

In Germany as in other European countries, healthcare waste is included in the List of Waste as chapter 18 - Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care). The waste is further divided in wastes from natal care, diagnosis, treatment or prevention of disease in humans (18 01) and wastes from





research, diagnosis, treatment or prevention of disease involving animals (18 02). Following the six-digit code of the List of Waste, a further classification of the waste is carried out e.g. for 18 01 the following waste codes can be found:

18 01 01 sharps (except 18 01 03)

18 01 02 body parts and organs including blood bags and blood preserves (except 18 01 03)

18 01 03\* wastes whose collection and disposal is subject to special requirements in order to prevent infection

18 01 04 wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)

18 01 06\* chemicals consisting of or containing dangerous substances

18 01 07 chemicals other than those mentioned in 18 01 06

18 01 08\* cytotoxic and cytostatic medicines

18 01 09 medicines other than those mentioned in 18 01 08

18 01 10\* amalgam waste from dental care

The list of waste was established by the Decision 2000/532/EC and is closely linked to the list of the main characteristics which render waste hazardous contained in Annex III to the Waste Framework Directive (Directive 2008/98/EC).

For the analysis, the waste stream

*18 01 03\* wastes whose collection and disposal is subject to special requirements in order to prevent infection*

was selected.

In Germany, no federal or country level regulations on healthcare waste exist. To harmonize waste management systems within Germany, the so called “LAGA” – the Joint Working Group of the German Federation/Federal States on Waste was set up. This working group is issuing interpretive guidelines which are considered as quasi waste regulations and are followed in all countries. For healthcare waste, the Communication no. 18 of the Joint Working Group of the German Federation/Federal States on Waste (LAGA) - Interpretive Guideline for the disposal of waste generated by health-care establishments - was issued in September 2009.

**The joint working group defines 18 01 03\* for Germany as follows:**

The special requirements for the collection and disposal of this type of waste result from the known or (based on medical experience) expected contamination with pathogens of the following diseases if these pathogens can cause a spread of the disease. Therefore, the list includes diseases which - with due regard to

- the danger of infection (contagiousness, infection dosage, epidemic potential),



- the survival capability of the pathogen (duration of the infection capability),
- the transmission route,
- the extent and type of the potential contamination,
- the amount of the contaminated waste and
- the severity of the disease that has been caused (as the case may be) and the possibility of a respective treatment

impose special requirements on infection prevention. The wastes in question require special attention also due to § 17 of the Infection Protection Act (IfSG) (items contaminated with pathogens that are subject to registration).

According to the current knowledge, wastes of this group can occur in connection with the following human diseases (in parentheses: relevant excretion/body liquid containing pathogens):

Transmission through direct contact with injured or not intact skin or mucous membrane (e.g. through inoculation):

- AIDS / HIV Infection (blood)
- Virus Hepatitis (blood)
- TSE (Transmissible Spongiform Encephalopathy) (body tissue, liquor)
- CJD, vCJD (Creutzfeldt-Jakob disease)

Faecal-oral transmission (smear infection):

- Cholera (faeces, vomited matter)
- Dysentery, HUS (haemolytic-uraemic syndrome ) (faeces)
- Typhus/Paratyphus (faeces, urine, bile, blood)

Aerogen transmission / droplet infection; smear infection:

- Active Tuberculosis (sputum, urine, faeces)
- Meningitis / Encephalitis (including, but not limited to, meningococcal meningitis) (sputum / pharyngeal secretion)
- Brucellosis (blood)
- Diphtheria (sputum / pharyngeal secretion, ichor)
- Leprosy (nasal discharge, ichor)
- Anthrax (sputum / pharyngeal secretion, ichor)
- Pest (sputum / pharyngeal secretion, ichor)
- Pox (pharyngeal secretion, pustule discharge)
- Poliomyelitis (sputum, pharyngeal secretion, faeces)
- Psittacosis (see Vet. Med. no transmission by humans)
- Q Fever (see Vet. Med. not transmission by humans)
- Maliasmus (sputum / pharyngeal secretion, ichor)
- Rabies (sputum / pharyngeal secretion)
- Tularaemia (ichor, pus)
- Virus-induced Haemorrhagic Fever (incl. Hantavirus (with renal syndrome / HFRS; with pulmonary syndrome / HPS)) (blood, sputum / pharyngeal secretion, ichor, urine)

Wastes of this type are usually generated:

- in clinical chemistry laboratories and serology laboratories for infection testing,
- in microbiological laboratories
- in isolation units of hospitals
- in dialysis units and centres in known virus carriers,
- in pathological departments,

but also:

- in the operating theatre or
- in physician offices with the focus on the treatment of patients with the listed diseases (i.e. not only treatment of sporadic individual cases).

These are wastes that are generated during the process of diagnosing, treating and caring for patients who are infected with the above listed diseases. These wastes are contaminated with blood / serum, excretion or secretion containing pathogens or they contain blood / serum in liquid form, or they consist of body parts and organs of patients with the respective diseases.

In order to assess the infection risk, detailed knowledge is required. Therefore measures, which are required in individual cases in the health-care establishments, shall be determined in consultation with the physician or person responsible for hygiene (e.g. the hospital sanitarian or the hygiene specialist), the healthcare facility physician and the specialist for occupational safety and health. Local conditions must be considered.

In any event, these wastes include all not inactivated / disinfected microbiological cultures that are generated in institutions for hygiene, microbiology and virology, in laboratory medicine, physician offices and similar facilities with respective activities and where a replication of the pathogens of any kind has occurred. The compliance with the provisions of the Biological Agents Regulation and the Technical Rules for Biological Working Substances shall have priority.

For infectious diseases usually transmissible by inoculation, requirements for safety and health at work shall have priority. Therefore these wastes include sharps, blood-filled containers and blood-soaked waste from operations of respective patients, respective specialised medical practices and laboratories and discarded dialysis systems from the treatment of known virus carriers. They do not include contaminated dry (non-dripping) wastes of respectively diseased patients (AIDS, virus hepatitis) from the treatment of individual patients, such as contaminated swabs from taking blood samples, non-dripping dressings or operation drapes and covers, cotton rolls from the dentist offices.

In case of infections that are transmitted faecally/orally, urine and faeces can be discharged into the waste water while observing the respective rules of personal hygiene and occupational safety and health (the municipal waste water bye-law has to be taken into account). In cases of cholera and dysentery, the Guideline for Hospital Hygiene and Infectious Disease Prevention issued by the Robert Koch Institute shall be observed.

All wastes of this waste code shall be collected directly at the source of their generation and put in tear-resistant, moisture-proof and tight containers (e.g. type-approved packages for hazardous materials). They must not be poured into another container or sorted in any way and shall be



transported in suitable, securely closed containers (if necessary, using bags in combination with returnable containers) to the central collection point. (Labelling of the containers with the biohazard symbol). A contamination of the collection containers at their outside must be avoided in any case. To ensure safe handling, the containers should not be too large.

For certain wastes, such as wastes with a high percentage of liquids, synthetic or paper bags - if used as the only containment during transport in the hospital and other health-care establishments - will not be considered to be meeting the safety standard. These bags may only be transported in a solid container that can also be used as a returnable container. Returnable containers must be easy to clean and allow for disinfection with approved procedures (§ 18 IfSG, Infection Protection Act).

The waste must be stored in such manner that a gas formation in the collection containers is avoided (e.g. a storage temperature of less than +15°C when the waste is stored for a maximum period of one week). If the storage temperature is less than +8°C, the storage time can be extended in consultation with a person responsible for hygiene (e.g. hospital sanitarian or hygiene specialist).

Without prior compacting or shredding them, these wastes must be incinerated in the collection containers in an approved incinerator. If no body parts and organ wastes or TSE pathogens are contained, they can be disinfected through processes approved by the Robert Koch Institute (see list of the tested and approved disinfectants and disinfectant processes; § 18 IfSG (Infection Protection Act); processes for the waste categories ABC). A spillage of wastes that are not disinfected must be avoided in either case. Disinfected wastes can be disposed of together with waste pursuant to waste code AS 18 01 04; the still existing risk of injuries that might be caused by sharps must be taken into account.

The disinfection units must be operated in accordance with the operating parameters specified for waste disinfection. The operational mode must be documented. The operation is only permissible if the operator can provide proof that the construction and functions of the unit meet the requirements of DIN 58949 or other specifications stipulated pursuant to § 18 IfSG upon inclusion in the RKI list - and that it is being tested and operated in accordance with these provisions.

Wastes from research in human medicine and biomedical research and diagnostics with the use of animals whose collection and disposal is subject to special requirements in order to prevent infection must be assigned to waste code AS 18 02 02\*.

**Federal wide analysis of the waste stream**

Considering the very detailed definition of this waste stream, it could be assumed that waste classification for healthcare waste is harmonized in Germany and that the waste generation rates are more or less homogenous in the Germany countries.

To analyse the waste stream, the waste generation rates of 4 years (2002, 2003, 2010 and 2011) were analysed:

German Country	2002 [tons/a]	2003 [tons/a]	2010 [tons/a]	2011 [tons/a]
Baden-Württemberg	723	838	1062	1217

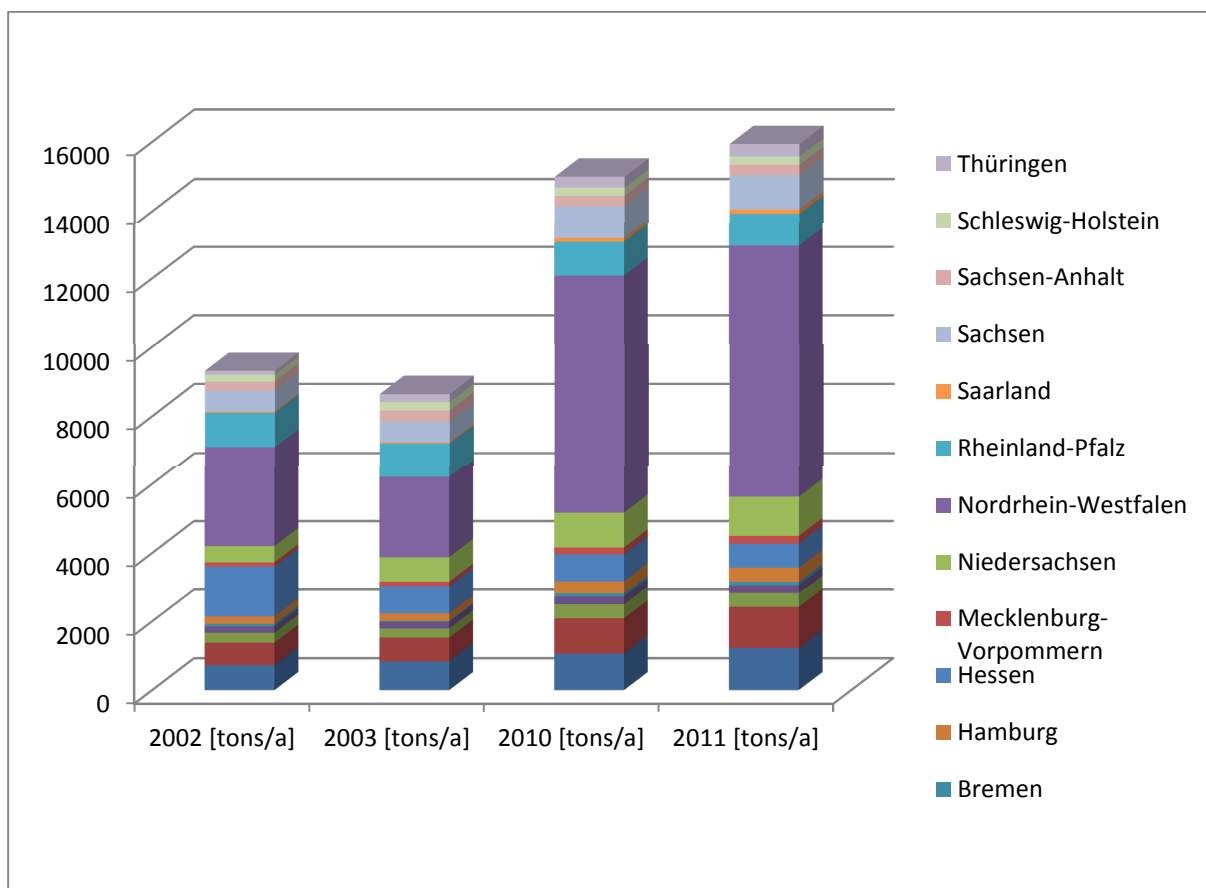


German Country	2002 [tons/a]	2003 [tons/a]	2010 [tons/a]	2011 [tons/a]
Bayern	651	682	1026	1198
Berlin	290	273	402	407
Brandenburg	187	190	230	240
Bremen	72	29	94	98
Hamburg	216	216	363	412
Hessen	1470	805	782	700
Mecklenburg-Vorpommern	124	136	201	223
Niedersachsen	468	714	1009	1139
Nordrhein-Westfalen	2896	2326	6915	7320
Rheinland-Pfalz	1000	1000	985	970
Saarland	36	40	112	124
Sachsen	598	598	967	984
Sachsen-Anhalt	260	310	298	304
Schleswig-Holstein	205	247	232	236
Thüringen	107	231	312	362
<b>Total</b>	<b>9303</b>	<b>8635</b>	<b>14991</b>	<b>15934</b>

For the first analysis, the overall amounts of generated 180103\* in the sixteen German countries (Baden-Württemberg, Bayern, Berlin, Brandenburg, Bremen, Hamburg, Hessen, Mecklenburg-Vorpommern, Niedersachsen, Nordrhein-Westfalen, Rheinland-Pfalz, Saarland, Sachsen, Sachsen-Anhalt, Schleswig-Holstein, Thüringen = Baden-Wurtemberg, Bavaria, Berlin, Brandenburg, Bremen, Hamburg, Hesse, Mecklenburg-Vorpommern, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Saxony, Saxony-Anhalt, Schleswig-Holstein, Thuringia) were added.

The analysis showed that the waste generation rates increased from 9393 tons in 2002 (8635 tons in 2003) to 15934 tons in 2011 (14991 tons in 2010).

This is equal to an increase of **nearly 85%** from the year 2003 to 2011.

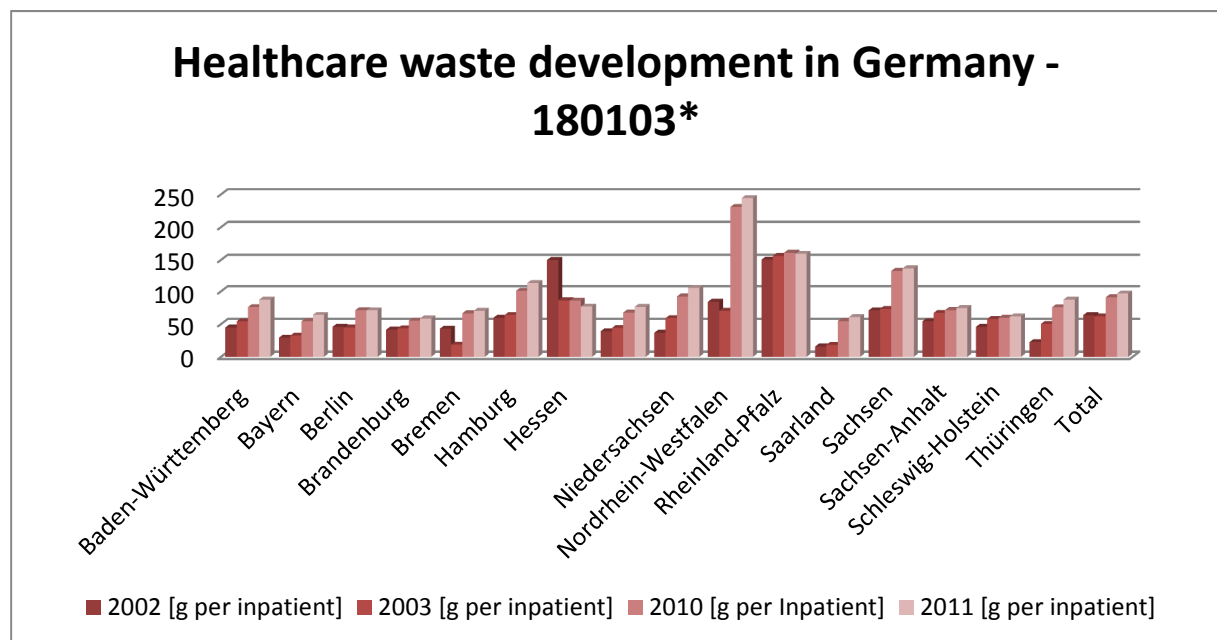


During the last decade, the German healthcare sector underwent several changes, including the reduction of hospital beds (from 504,684 general hospital beds in 2002 to 461,022 general hospital beds in 2011) and a decrease of the hospital bed occupancy rate (from 79,4 % in 2002 to 75,9 % in 2011). To be able to compare the waste generation rates among the countries, the data were normalized and the waste generation rate was calculated on an inpatient treatment days basis (180103\* generated per inpatient of a general hospital per day). The analysis showed the following result:

German Country	2002 [g per inpatient]	2003 [g per inpatient]	2010 [g per inpatient]	2011 [g per inpatient]	Increase
Baden-Württemberg	45	54	76	87	95%
Bayern	29	32	54	64	119%
Berlin	46	45	71	71	55%
Brandenburg	41	43	55	59	41%
Bremen	43	19	66	70	64%
Hamburg	60	64	101	113	89%
Hessen	150	86	86	77	-49%
Mecklenburg-Vorpommern	39	44	68	76	95%
Niedersachsen	37	59	92	105	187%
Nordrhein-Westfalen	84	70	231	244	191%
Rheinland-Pfalz	150	156	161	159	6%

Saarland	16	18	55	61	286%
Sachsen	71	73	133	137	93%
Sachsen-Anhalt	54	67	71	74	37%
Schleswig-Holstein	46	58	60	62	35%
Thüringen	22	50	76	87	289%
<b>Total</b>	<b>64</b>	<b>62</b>	<b>91</b>	<b>97</b>	<b>52%</b>

Overall, it can be found that the generation of 180103 per inpatient treatment day increased during the last years by about 50%. The research however showed a strong differentiation of normalized waste generation rates among the countries (e.g. from 244 g in North Rhine-Westphalia to only 59 g in Brandenburg) and also showed that the developments differed from country to country (e.g. from a reduction of 49% in Hesse to an increase of 289% in Thuringia).



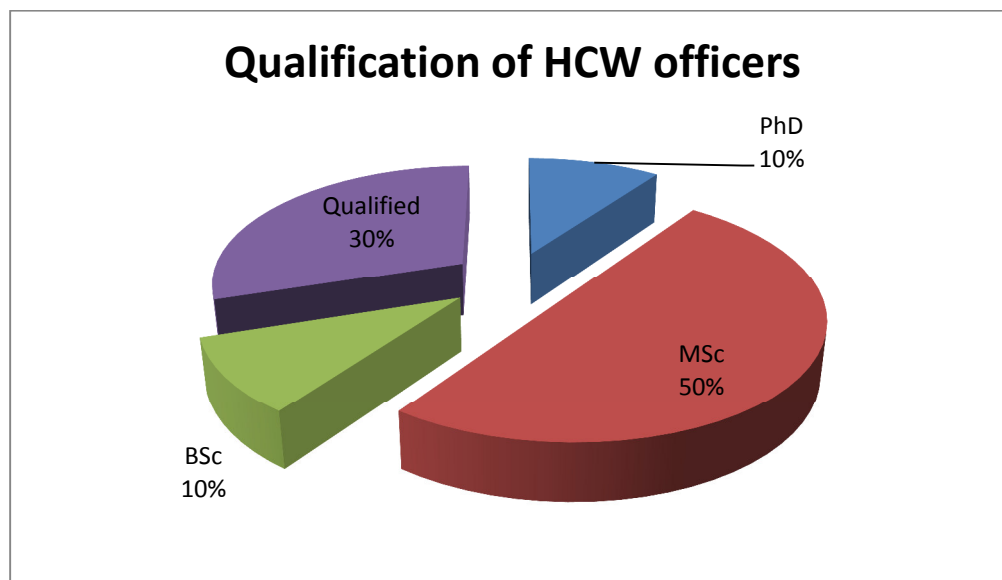
Based on the research, the statement by the healthcare waste officers of an increase of waste generation rates could be confirmed for the example of 180103\*.

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

To identify the skills, competences and trainings of staff which is appointed to manage healthcare waste in healthcare facilities, questionnaires was developed and send to the appointed waste managers of healthcare facilities. The following information are based on the information provided during interviews, discussions with experts and from the analysis of the collected questionnaires.

### 3.1 Skills – Competences

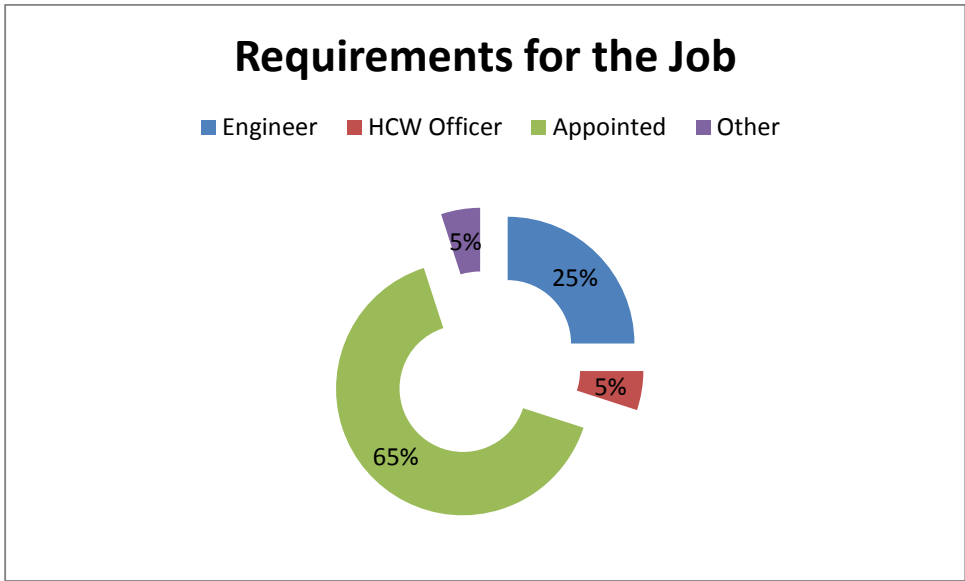
The analysis of the Healthcare Waste appointees (officers) show that the majority of the officers followed a tertiary education, more than 50% hold a master degree or higher.



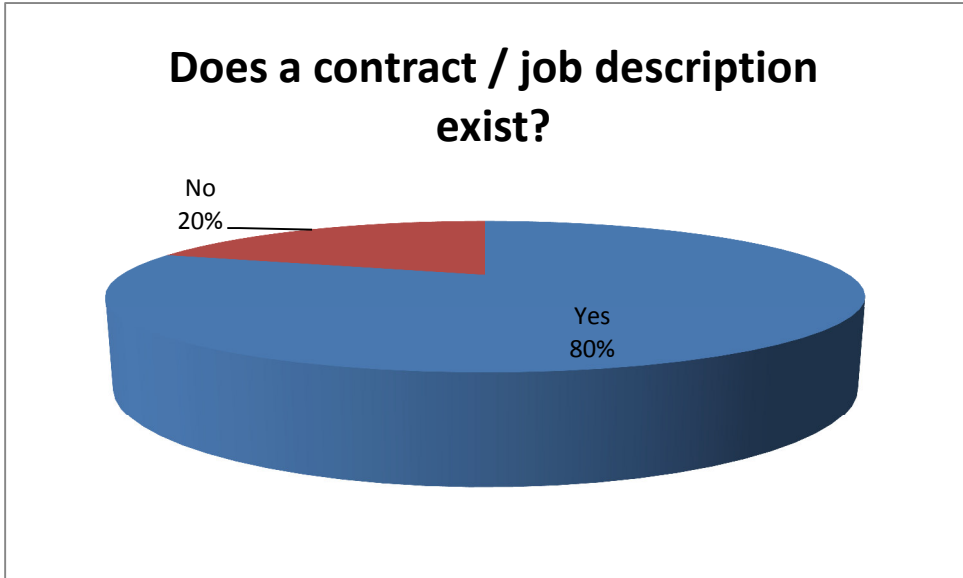
In average, the research show that the participating persons have in average about 10 years work experience (9,63 years).

This high education level is however not mirrored during the employment and appointing processes. In most cases, the education level was not a formal requirement to be appointed as waste officer, in most cases the responsible officer was directly appointed by the management of the healthcare facilities. Only in ¼ of the cases, the open position was formally advertised. If advertised, the requested qualification was a tertiary level degree in a field related to waste management.



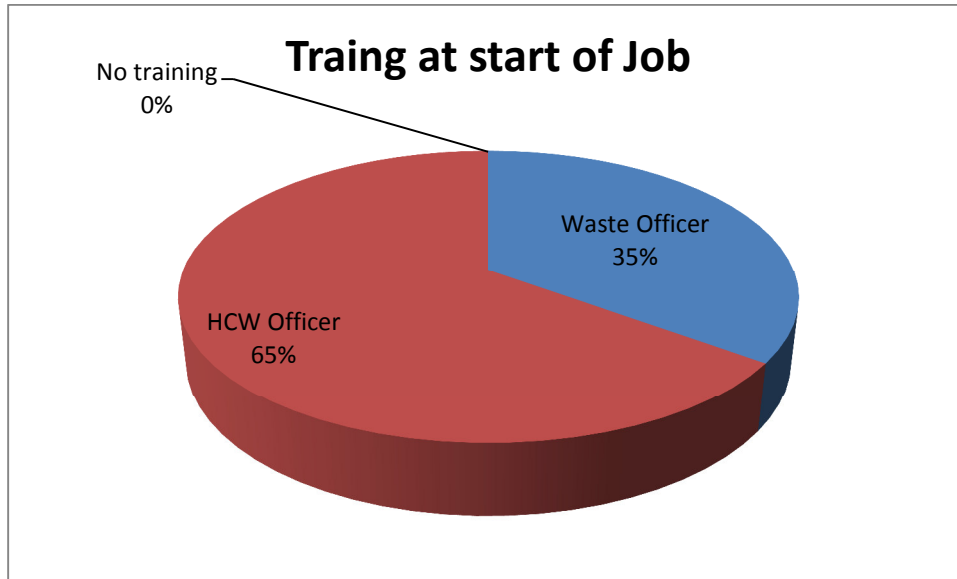


More than ¾ (80%) of the interviewed persons have either a formal job description and/or a contract of employment / contract for service delivery which describes their role and responsibilities.

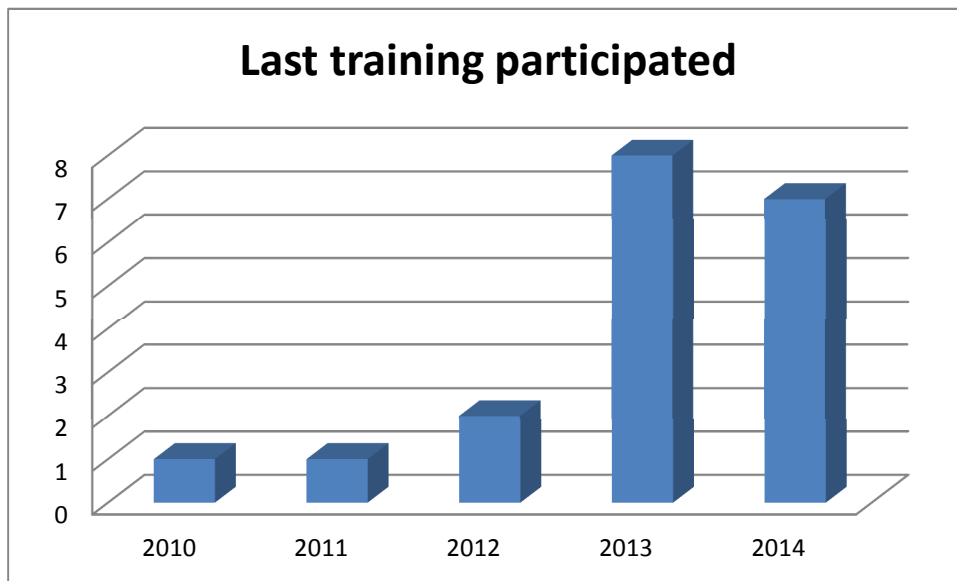


### 3.2 Existing Training on Health Care Waste Management

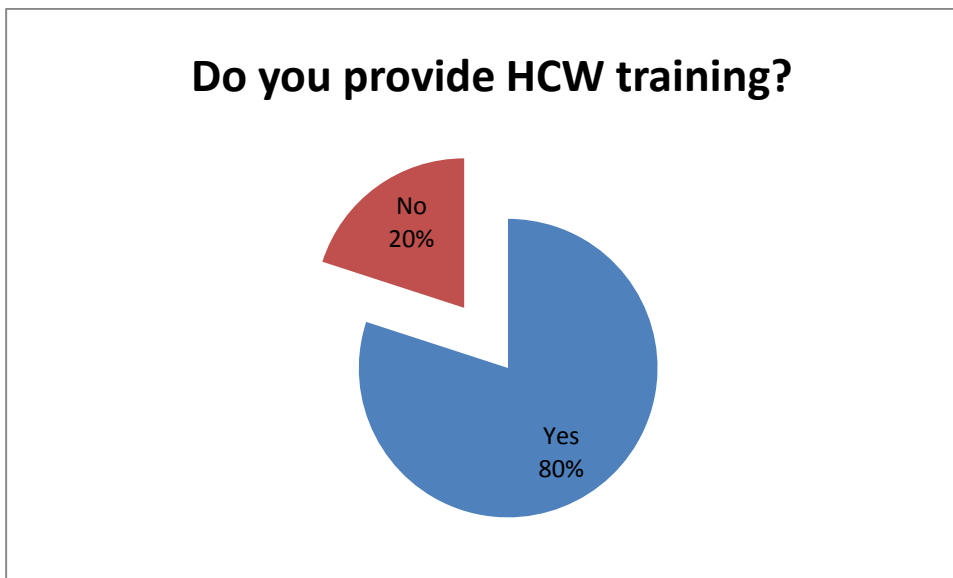
The carried out research showed that all persons received training either before or directly after they got appointed as waste officer and are responsible for waste management. While the majority received in the beginning a specific training on healthcare waste management, about 1/3 participated in a general training which qualifies them to act as waste officer (Abfallbeauftragter).



With one exemption, all waste officers confirmed that their employer provides training opportunities on healthcare waste. In average the officers spend 1,5 days per year on training. Typically they participate at least every second year in a training to update their know-how.



It should be noted that about 80% of the healthcare waste officers are responsible to provided training on healthcare waste in their facilities and also in secondary and tertiary level establishments of higher education.



### 3.3 National Qualification Framework – Award Units

In Germany, a national qualification framework for healthcare waste officers does not exist. The Federal Ministry for the Environment, Nature Conservation Building and Nuclear Safety is authorized, after hearing the parties concerned (§§ 68), by ordinance to prescribe the demands on the expertise and reliability of the waste management officer.

The Federal Ministry for the Environment, Nature Conservation Building and Nuclear Safety however has so far not issued an ordinance which describes the formal requirements for a vocational training to prove the requisite qualification for waste officers. Private training companies exist in different counties who received confirmation from the local responsible authorities that their trainings are recognized.

### 3.4 Duties and Responsibilities

In Germany, as far as environmental protection and infection prevention are concerned, in-house supervision procedures are mandatory. For this purpose, hospitals and clinics have to appoint not only a person responsible for hygiene, but also a healthcare facility appointee for waste management pursuant to §§ 54 ff. KrW-/AbfG in conjunction with the Ordinance on Healthcare facility Waste Management Officers. This appointment must be executed in writing and communicated to the competent authority.

Pursuant to § 55 KrW-/AbfG, his or her duties shall include:

#### **Waste Management Initiatives**

The healthcare facility appointee for waste management shall advocate the procurement of environmentally friendly products and procedures, develop strategies that help to avoid or recycle waste and take the necessary steps for a proper disposal of all generated wastes. He or she advises the management of the establishment on all matters that might be important for the closed substance cycle waste management and the waste disposal, in particular, on the planning and implementation of waste management measures. While doing so, not only the provisions of the

waste legislation must be observed, but also the requirements of the other areas that are relevant for the environment, e.g. the water and soil protection or immission control. As far as occupational safety and health is concerned, a close cooperation with the person responsible for hygiene, the specialist for occupational safety and health and the healthcare facility physician is necessary.

### **Duty to supply Information**

The healthcare facility appointee for waste management shall be obliged to inform the management and the staff members of the establishment about the risks for humans and the environment that might be associated with wastes and the measures to be taken. Such information must be given in a suitable form, e.g. within the framework of seminar trainings.

### **Supervision**

The healthcare facility appointee for waste management shall be obliged to track and supervise the on-site and off-site route of the waste until its final disposal and check the observation of the duty to provide and keep proof thereof. He or she shall be obliged to optimize disposal processes and cost.

### **Obligation to report**

The healthcare facility appointee for waste management shall be obliged to report to the management on a regular basis, at least once a year, with the report containing deficiencies/insufficiencies detected, remedial measures taken and the wastes generated and disposed of.

### **Rendering expert advice**

The healthcare facility appointee for waste management shall advise the management on matters that might be important for the closed substance cycle waste management and the waste disposal, in particular, on the planning of on-site waste treatment facilities.

To be able to perform these duties, the healthcare facility appointee for waste management must be carefully chosen (qualification), officially appointed (determining his or her scope of competence), supported (e.g. through the provision of the respective resources, rooms, working hours, staff members, the facilitation of a participation in training and qualification courses) and be given a right to present his or her issues to the management.

Since hospitals and clinics as waste generators have full responsibility for the proper disposal of all wastes, the Healthcare facility Waste Management Officer must be given the required time for the fulfilment of his duties. To avoid corporate/organisational negligence, the Healthcare facility Waste Management Officer shall be - to the necessary extent - exempt from other duties to execute these tasks.

Assigning him or her without an exemption from other duties should be avoided. For larger establishments (with more than 800 beds and a respective amount of generated waste), it is advisable to employ a full-time waste management officer. (cf. Waste Management Industry Concept in the publication "Branchenarbeit und Abfallmanagement" [Industry Work and Waste Management] on the website of the "Industrieabfallkoordinationsstelle Sachsen" [industrial waste coordination point Saxonia] - [www.ik-sachsen.de](http://www.ik-sachsen.de) )



### 3.5 Training needs detected

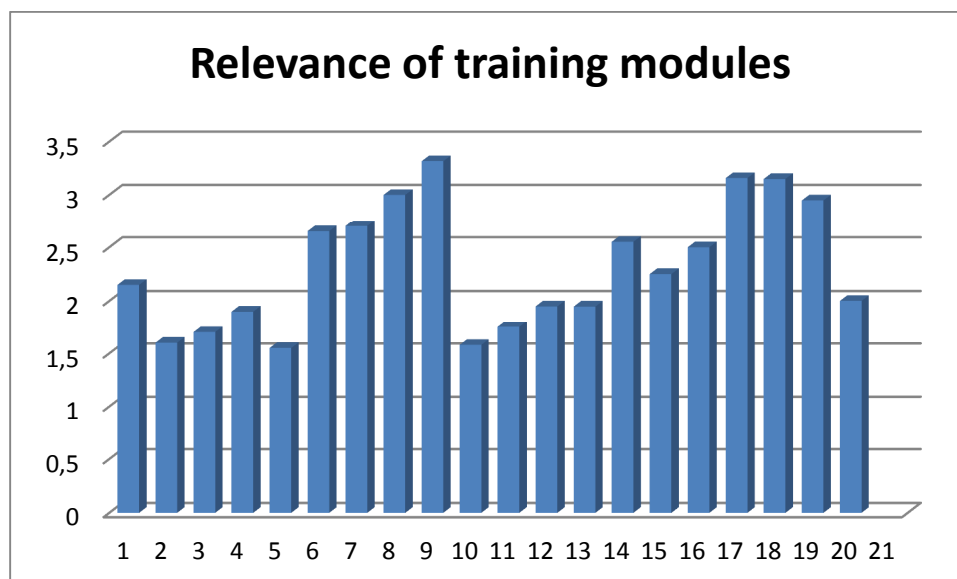
To identify training needs, the persons participating in the questionnaire were asked to rate the following, typical training units on a scale from:

1=very important to 5 not important.

The suggested training units were:

1. Control the collection of hazardous and non-hazardous waste at a healthcare facility
2. Control the movement, sorting and storage of hazardous and non-hazardous wastes
3. Manage the movement, sorting and storage of recycled materials and vehicle movements at a healthcare facility
4. Monitor the procedures to control risks to health and safety of the waste management function at a healthcare facility
5. Control site operations for the transfer of hazardous and non- hazardous healthcare waste at a healthcare facility
6. Control the reception of infectious wastes at a healthcare waste treatment facility
7. Control site operations for the treatment of infectious healthcare waste at a healthcare facility
8. Control the disposal of outputs and residues from infectious healthcare waste treatment operations at a healthcare facility
9. Control maintenance and other engineering operations at an infectious healthcare waste treatment facility
10. Control the disposal of outputs and residues from hazardous and non- hazardous waste transfer
11. Control improvements to waste management operations at a healthcare facility
12. Ensure protection of the environment at healthcare facilities treating or transferring hazardous waste
13. Support the efficient use of resources
14. Manage a budget
15. Select and manage sub contracted services
16. Implement and manage contracted service or supplies
17. Manage cleaning services at a healthcare facility
18. Contribute to the selection of personnel for activities
19. Review the performance of teams and individuals
20. Create effective working relationships

The analysis of the questionnaires showed the following results:



The “Top Ten” training units are (not in order of ranking):

- Control of the collection of hazardous and non-hazardous waste
- Control the movement, sorting and storage of hazardous and non-hazardous wastes
- Management of the movement, sorting and storage of recycled materials and vehicle movements at a healthcare facility
- Monitoring of the procedures to control risks to health and safety of waste management
- Control site operations for the transfer of hazardous and non- hazardous healthcare waste
- Control the disposal of outputs and residues from hazardous and non- hazardous waste transfer
- Control improvements to waste management operations at a healthcare facility
- Ensure protection of the environment at healthcare facilities treating or transferring hazardous waste
- Support the efficient use of resources
- Create effective working relationships

Other subjects, especially subjects related to the treatment of waste, cleaning services and human resource management are considered as less important.

The participants in the questionnaire stated that especially the following sectors would be important for additional training:

- Waste management for managers (Awareness raising) and practical waste classification
- Information on overlapping areas as hazardous goods, Biosafety, Water and waste water management
- Communication, Motivation, Information materials, organization, development and usage of waste management tools
- Motivation of co-workers, management systems

## CHAPTER 4 REMARKS – CONCLUSIONS

Despite that in Germany no official training system for healthcare waste officers exist, a working system was set up and nearly all persons responsible for waste management in a healthcare facilities participated in trainings and are regularly refreshing and updating their know-ledge. The education level of the appointed waste officers can be considered as high to very high. Waste appointees consider especially all aspects on the monitoring and control of waste management as important subjects for trainings.

## ANNEXES

### ANNEX A Questionnaire

#### EU-HCWM Fragebogen

Abfallbeauftragte/r: \_\_\_\_\_

Datum: \_\_\_\_\_

Einrichtung: : \_\_\_\_\_

Ort: \_\_\_\_\_

(Anmerkung: Die folgenden Fragen sind harmonisiert/standardisiert und entsprechen nicht immer den spezifischen, nationalen Bedingungen. Alle Fragebögen werden vertraulich behandelt)

Frage 1: Was ist Ihre berufliche Ausbildung und können Sie Ihre Berufserfahrung kurz beschreiben?

Antwort 1: \_\_\_\_\_

F2. Wie lange sind Sie als Abfallbeauftragte/r bestellt?

A2: \_\_\_\_\_

F3. Wie war Ihre Position ausgeschrieben und was waren die Anforderungen an die Position?

A3: \_\_\_\_\_

F4. Haben Sie eine Aufgaben-/Stellenbeschreibung bzw. festen Anstellungsvertrag?

A4: \_\_\_\_\_

F5. Falls zutreffend – welche Art von Fortbildung haben Sie erhalten als Sie das erste Mal als Abfallbeauftragte/r bestellt wurden?

A5: \_\_\_\_\_

F6. Bietet Ihnen Ihr Arbeitgeber Möglichkeiten zur Fortbildung und wenn ja, in welchen Themenbereichen und wie oft finden diese Fortbildungsveranstaltungen statt?

A6: \_\_\_\_\_

F7. Bieten Sie als Abfallbeauftragte/r in Ihrer Einrichtung Trainings- und Bildungsmaßnahmen für Angestellte des Hauses an? Wenn ja – welche Themenbereiche umfasst dies und wie oft finden Veranstaltungen statt?

A7: \_\_\_\_\_





F8. Nehmen Sie an einen kontinuierlichen Fortbildungsprogram teil, in denen Ihre Kenntnisse regelmäßig aufgefrischt werden? Wenn ja, wann war die letzte Teilnahme an einem Auffrischkurs?

A8:

F.9. Im Folgenden finden Sie eine Übersicht über Ausbildungsmodule die im Rahmen der standardisierten, EU-weiten Fortbildung für Krankenhausabfallbeauftragte zur Erlangung der Fachkunde vorgeschlagen wurden. Aus Ihrer Sicht und Erfahrungen – können Sie die Relevanz der folgenden Module für die Fachkunde beurteilen?

A9: Vorgeschlagene Module der beruflichen Weiterbildung bzw. Fortbildung zur Erlangung der Fachkunde für Krankenhausabfallbeauftragte

1. Modul: Überwachung der internen Transport-Logistik für nicht-gefährliche und gefährliche Abfälle

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

2. Modul: Überwachung der Abfallseparierung und der Lagerhaltung für nicht-gefährliche und gefährliche Abfälle

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

3. Modul: Management der Sortierung, Sammlung, Transport und Lagerung von Abfällen für die Verwertung

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

4. Modul: Überwachung der Arbeitssicherheit bei Entsorgungsaufgaben

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

5. Modul: Überlassung und Nachweisführung von nicht-gefährlichen und gefährlichen Abfälle zur Entsorgung und Verwertung

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

6. Modul: Kontrolle und Annahme von infektiösen Abfällen in einer Abfallbehandlungsanlage für Krankenhausabfälle

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

7. Modul: Überwachung des Betriebes der Behandlung von infektiösen Abfällen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

8. Modul: Überwachung der Entsorgung von Abfällen und Rückständen aus der Behandlung von infektiösen Abfällen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:



9. Modul: Überwachung der Wartung und Validierung von Krankenhausabfallbehandlungsanlagen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

10. Modul: Überwachung der fachgerechten Entsorgung von gefährlichen und nicht gefährlichen Abfällen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

11. Modul: Sicherstellung der kontinuierlichen Verbesserung des Abfallmanagements in medizinischen Einrichtungen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

12. Modul: Sicherstellung von generellen Umweltschutzbelangen bei der Behandlung und Entsorgung von Abfällen aus dem Gesundheitswesen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

13. Modul: Effiziente Nutzung von Ressourcen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

14. Modul: Budgetverwaltung für die Abfallwirtschaft

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

15. Modul: Auswahl und Management von Unterauftragnehmern

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

16. Modul: Verwaltung und Implementierung von vertraglich vereinbarten Lieferungen und Leistungen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

17. Modul: Management von Reinigungsdienstleistungen für Gesundheitseinrichtung

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

18. Mitwirkung bei der Personalauswahl für Beschäftigte in der Abfallwirtschaft

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

19. Überprüfung der Effizienz von Teams und Einzelpersonen

Sehr wichtig:  Wichtig:  OK:  Nicht so wichtig:  Unwichtig:

20. Effiziente Zusammenarbeit in der Abfallwirtschaft

Sehr  Wichtig:  OK:  Nicht so  Unwichtig:



wichtig:

wichtig:

F10: Basierend auf Ihren Erfahrungen – welche Module sollten hinzugefügt werden?

A10:

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Vielen Dank!