Impact assessment of health care waste management practices in hospitals in Ukraine

Final report
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ABBREVIATIONS

EU	European Union
FGD	Focus Group Discussion
H&T Program	UNDP Health and Transparency Program
HCW	Health Care Waste
HCWM	Health Care Waste Management
MOH	Ministry of Health of Ukraine
MOEEP	Ministry of Energy and Environmental Protection
N/D	Not disclosed
POPs	Persistent Organic Pollutants
SDG	Sustainable Development Goal
SPHS	Sustainable Procurement in the Health Sector
UN	United Nations
UNDP	United Nations Development Program
UNDP GEF	United Nations Development Program Global Environmental Finance
UNEP	United Nations Environment Program
UNICEF	United Nations Children's Fund
UNOPS	United Nations Office for Project Services
WHO	World Health Organization

CONTENTS

1. INTRODUCTION

Recognizing a unique capacity of the United National Development Programme (UNDP) as a development partner in the health care sector and its proven track record in supporting public health institutions, UNDP Ukraine and the Ministry of Health of Ukraine (MOH) have been partnering since 2015 to strengthen the national health care procurement system and thereby improve the effectiveness of diagnosis and treatment of patients in Ukraine within the project 'Procurement Support Services to the Ministry of Health of Ukraine'. The specific objectives of the project include procuring medicines and medical products for national public health programmes from 2015 onwards, as needed, and strengthening the capacity of the MOH to ensure the transparency, accountability and effectiveness of the public procurement of medicines and other medical products.

As each purchasing decision has an impact on the environment, economy and society, the purchase of sustainable goods and services can help drive markets in the direction of innovation and sustainability and enable the transition towards a more sustainable economy.

In most health care facilities, health care waste management (HCWM) is considered a best practice in health care operations management, as the improper disposal of waste generated in health care facilities (HCFs) can have direct and/or indirect impacts on public health and the environment. Therefore, the introduction and promotion of appropriate HCWM practices could significantly reduce harmful waste generated in HCFs. This could also be reflected in a public procurement policy to ensure that suppliers are incentivized to supply products that are less wasteful and/or to provide medicines and commodities that contain appropriate disposal guidelines.

As proved by the experience of UNDP Country Offices in Ghana, Kazakhstan, Kyrgyzstan, Madagascar, Tanzania and Zambia—all of which participated in projects funded by UNDP Global Environmental Finance to implement the Stockholm Convention on Persistent Organic Pollutants (POPs) and the Minamata Convention on Mercury (specifically in HCWM)—to improve HCWM legislation and hospitals' and clinics' HCWM practices in their respective countries, a baseline review of national legislation and practices is needed to understand the current impact of HCWM practices on society, the environment and the economy.

Given the absence of baseline data on HCWM practices in Ukraine, it is difficult to implement UNDP initiatives to plan and promote country-specific responsible practices in the health care sector. Therefore, with the current knowledge gap, this limits the action that can be taken to address unsustainable practices in health care and, in turn, jeopardizes both human and environmental health in Ukraine. This research project seeks to examine the gaps that exist in the national legislation pertaining to HCWM in Ukraine and provide recommendations on how to close those gaps, as well as to analyse current HCWM practices in selected Ukrainian HCFs to put forward recommendations on how to improve them.

Chapter 3 of this report gives an overview of the research methodology, including the sampling of hospitals and clinics, data collection procedures and tools, and evaluation procedures and research limitations. Chapter 4 summarizes the literature review of Ukrainian national legislation and policies and key European Union (EU) waste directives to be implemented in Ukraine according to the EU–Ukraine Association Agreement, as well as foreign literature on key international environmental conventions and Ukraine's participation in them, and a review of key publications on HCWM from international organizations, including the World Health Organization (WHO), UNDP, the United Nations Children's Fund (UNICEF) and others. Chapter 5 provides an assessment of HCWM practices in eight hospitals and clinics interviewed for the research, including a summary of the HCWM flow diagram and a social, economic and environmental impact assessment of such practices. Chapter 6 gives an overview of the case of Lithuania, a country that went through a similar process to Ukraine

to develop its HCWM. Chapter 7 provides research conclusions and recommendations to improve current HCWM practices and Ukraine's legislation and policies in the field.

2. EXECUTIVE SUMMARY

Health care waste (HCW), classified as hazardous waste, poses a serious risk to the environment and public health. Generated by HCFs, scientific and educational institutions, pharmaceutical companies and households, not all HCW is hazardous and requires special handling.

According to data collected by the State Statistical Service of Ukraine from hospitals and clinics, around 700–1,000 tons[1] of HCW is generated in Ukrainian HCFs annually, but this number cannot be taken at face value, since very few HCFs submit statistical reports (only 611 HCFs of the 1,700 hospitals and 10,400 outpatient clinics operating in Ukraine in 2017 submitted such reports that year). It is quite likely that unreported HCW goes to numerous illegal landfill sites around Ukraine.[2]

As part of a global community, Ukraine's practices, including those in HCWM, should be guided by the 17 Sustainable Development Goals (SDGs), and specifically SDG 3 (good health and well-being), which is of relevance to HCWM, public procurement and health procurement in particular. The SDGs are interlinked, and appropriate HCWM also contributes to other SDGs, including but not limited to:

- SDG 1 (no poverty): Good health is a strong enabling factor for poverty eradication
- SDG 5 (gender equality): Most health care workers in Ukraine are women and are mostly involved in HCWM practices in hospitals and clinics (as presented in Chapter 5.2.1)
- SDG 8 (decent work and economic growth): Provision of adequate individual protective measures for employees involved in HCWM at hospital level and training them to safely handle HCW ensures their right to decent work and labour rights
- SDG 11 (sustainable cities and communities): In Ukraine the community is not aware of the way HCW is treated off site because this requirement is not envisaged in Ukrainian legislation
- SDG 12 (responsible consumption and production): Sustainable procurement starts the supply chain of medicines and medical commodities and can positively influence the waste management process
- SDG 13 (climate action): Climate change is now affecting every community and country, and appropriate waste management and procurement can minimize the negative impacts on the environment
- SDG 16 (peace, justice and strong institutions): Building effective and accountable institutions and putting in place transparent regulations and realistic government budgets ensures the gradual elimination of corruption and more sustainable operation of institutions as crucial as those in the health care sector.

Ukrainian legislation on waste management, including HCWM, is outdated and needs to be brought in line with six EU waste directives as set forth by the EU–Ukraine Association Agreement. In the last couple of years, Ukraine adopted several national strategic documents that govern the field of waste management, including the National Waste Management Strategy until 2030 (2017) and the National Plan for Waste Management in Ukraine until 2030 (2019). Both the MOH and the Ministry of Energy and Environmental Protection (MOEEP) are responsible for management of parts of the system, with their responsibilities overlapping. The Draft Law on Waste Management registered in the Ukrainian Parliament on 2 July 2019 foresees the creation of a special central executive authority, the Waste Management Agency, but it has not yet been voted on. Although the Law on Public Procurement

[1] The data were received after a request for information submitted to the State Statistical Service of Ukraine. See <http://www.ukrstat.gov.ua/operativ/operativ2018/ns/upvl_IV/upvl_IV2018_u.html>.
[2] Cabinet of Ministers of Ukraine, 'National Waste Management Strategy until 2030', Kyiv, 2017, <https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80>.

makes the process of procurement of HCW treatment services more transparent, it still does not guarantee the selection of a reliable company.

Additionally, the HCWM field does not operate in isolation, and such social issues as gender, social inclusion, labour rights and workplace safely come into consideration for HCWM workers. Ukrainian national legislation in these aspects mostly conforms to international conventions, but the character of these legislative acts is mostly declarative and not clearly enforced at hospital level, apart from some of the labour rights and workplace safety requirements, such as provision of training on HCWM and personal protective measures for employees.

As far as the international conventions are concerned, Ukraine is a signatory to four of the five international environmental conventions and has a requirement to adapt its legislation to these international treaties. As a member of many international organizations and United Nations agencies, Ukraine can also use the guidelines of such organizations as WHO, UNDP, UNICEF and others to develop recommendations on improving HCWM practices at the hospital level, given that these guidelines set the minimum approach. To understand the practices of HCWM in Ukrainian hospitals and clinics, eight hospitals and clinics were visited and interviewed, and the results are summarized in the next three pages.

HCWM FLOW DIAGRAM FOR EIGHT HOSPITALS AND CLINICS INTERVIEWED[3]

HCWM PROCESS	CATEGORY A	CATEGORY B	CATEGORY C
GENERATION	All hospitals and clinics interviewed generate this type of waste: glass, plastic, paper and solid municipal waste (SMW), including food waste.	All the hospitals and clinics interviewed generate Category B waste. Its types vary based on the specialty of the hospital and the services it provides to patients. Examples of Category B waste generated in the hospitals and clinics interviewed include: • Anatomical waste • Sharps • Laboratory waste • Disposable used medical waste (bandages, cotton etc.) • Medical plastic and glass waste (syringes, infusion systems, gloves, flasks)	All the hospitals and clinics interviewed have some sort of Category C waste—either light bulbs used for different purposes or mercury-containing thermometers (except for two children's clinics and a perinatal centre).
SEGREGATION, STORAGE (AND DISINFECTION) AT GENERATION POINT	Only a city clinic and a public children's clinic segregate some plastic waste, while others do not segregate Category A waste. This type of waste is collected in a separate bin with a plastic bag placed inside it.	While the quality and the look of these containers differ from hospital to hospital, all the HCFs interviewed have separate containers for different types of Category B waste with plastic bags placed inside them (at least a 'three-bin' sorting system is used). Except for one regional hospital that autoclaves all its medical waste, all the others disinfect (with liquid) their medical waste at generation points and discharge the disinfectant into the sewerage system afterwards. The waste is segregated and stored at generation points until the end of the shift; following disinfection it is transported to temporary storage places.	Most of the hospitals and clinics interviewed do not have any specific instructions on how to collect, segregate and store Category C waste. Instead, in those hospitals and clinics where mercury-containing thermometers are still used, they have instructions on how to act when such a thermometer is

[3] For the purpose of this table and the research in general, the definition of waste categories is used according to the Decision of the Ministry of Health 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management' (2015) as follows:
CATEGORY A: Epidemically safe medical waste, similar to municipal waste, such as: food waste from all departments of the HCF except infectious; waste that did not have contact with biological liquids of patients, infectious and dermatovenerological patients; SMW (including bulky waste, construction waste) from all departments, except infectious.
CATEGORY B: Epidemically unsafe medical waste, such as used medical instruments, objects stained with blood or other biological liquids, organic medical waste of patients, food waste from the infectious department, laboratory waste.
CATEGORY C: Toxicologically unsafe medical waste, such as pharmaceuticals, diagnostic and disinfection items, batteries, goods and equipment containing mercury or heavy metals, waste generated as a result of the operation of equipment, transport and lighting systems.
CATEGORY D: Radiologically unsafe medical waste generated as a result of the use of radioisotopes for medical or scientific purposes which exceeds permissible levels of radiological safety.

HCWM PROCESS	CATEGORY A	CATEGORY B	CATEGORY C
TEMPORARY STORAGE AT DEPARTMENT	Apart from a public children's clinic that has temporary storage for recyclable plastic in a plastic bag at a department level in a separate drawer, the other hospitals and clinics interviewed do not have such storage (they store segregated plastic with disinfected Category B waste instead).	A perinatal centre and a city clinic do not have temporary storage at the department level. The other hospitals and clinics interviewed have temporary storage places at department level where waste from all the generation points is carried and repacked into larger plastic bags or containers.	broken. These instructions prohibit disposal of this waste into municipal waste bins and the sewerage system, but it is unclear whether hospitals and clinics that have them have contractors that dispose of this type of waste. As far as light bulbs are concerned, the hospitals and clinics interviewed either participate in free of charge programmes organized by their local governments or non-governmental organizations to dispose of such waste (a city clinic and a military hospital) or do not have a contract with companies responsible for the disposal of light bulbs (except for one regional hospital and a public children's clinic).
TRANSPORTATION WITHIN HCF	In all hospitals and clinics where Category A waste is not segregated, it is carried in plastic bags from the generation points to the municipal waste containers outside. In the case of a public children's clinic, recyclable plastic waste is repacked into larger packaging (plastic bags, cardboard boxes etc.) and transported by the clinic itself in a regular car to another building belonging to the clinic located in another part of the city.	For hospitals and clinics that have waste storage places (either common or at department level) in the same building (two children's clinics, a perinatal centre and a military hospital), the packages containing waste are usually carried by hand to these places. For those hospitals and clinics that have common storage places separate from the main hospital building (two regional hospitals and clinics and a city clinic), the waste is repacked into larger plastic bags (a regional hospital and a city clinic) or into special plastic bags for autoclaving (another regional hospital) and transported to the common storage places on trolleys that are not designed for the transportation of medical waste.	
COMMON STORAGE AT HCF	Common storage for Category A waste comprises municipal containers located outside (with some special containers for plastic or glass).	A military hospital does not have common storage at the HCF, while the other hospitals and clinics interviewed do. In the cases of two regional hospitals and a city clinic, their common storage rooms are in separate buildings (or shipping containers), where the waste is stored for a long time. In the cases of two children's clinics and a perinatal centre, their common storage rooms are in the same building (at department level or in a basement), where the waste is currently also stored for a long time. In the cases of hospitals that generate anatomical waste, they store it either in refrigerators in pathology and anatomy departments (two regional hospitals, a military hospital and a city oncology clinic) or in specially designated cool places without refrigerators (a city clinic).	
TREATMENT WITHIN HCF	Category A waste is not treated within the HCF.	Except for two cases, the hospitals and clinics interviewed do not have any treatment of Category B waste within the HCF, and if they have autoclaves and/or microwaves, they are used to sterilize reusable medical instrument. The exceptions are a perinatal centre that has an on-site incinerator used to burn its anatomical waste—namely, post-abortion material—and a regional hospital that has specially assigned autoclaves to pretreat its medical waste.	

HCWM PROCESS	CATEGORY A	CATEGORY B	CATEGORY C
TRANSPORTATION OUTSIDE HCF	In all the cases, Category A waste is collected daily, apart from at one private children clinic, where it is sometimes collected every two days. In the case of a public children's clinic that segregates some recyclable plastic waste, this waste is collected on demand. None of the representatives of the hospitals and clinics interviewed knew whether their Category A waste is transported by their contracted companies or a third party.	The time for the collection of Category B waste varies across hospitals and clinics: • **DISINFECTED RECYCLABLE MEDICAL WASTE:** In the cases of hospitals and clinics (a perinatal centre, a regional hospital, a city clinic, a public children's clinic and a military hospital) that recycle some of their disinfected medical waste—either plastic or glass—such waste is collected on demand, except for a military hospital where such waste is collected monthly. • **DISINFECTED NON-RECYCLABLE MEDICAL WASTE:** In all the cases, disinfected (liquid or autoclaved in the case of one regional hospital) medical waste that cannot be recycled is collected on demand, monthly, quarterly or twice a year. • **ANATOMICAL WASTE:** In the cases of hospitals and clinics that generate anatomical waste, such waste is collected either twice a week on 'surgery days' (a city clinic), on demand (a regional hospital), weekly (another regional hospital) or quarterly (a military hospital). None of the representatives of the hospitals and clinics interviewed knew whether their Category B waste is transported by their contracted companies or a third party.	
FINAL TREATMENT	In all cases, Category A waste is taken to landfill, while recyclable plastic waste from a public children's clinic and a city clinic is recycled. In the case of a city clinic, all or part of general Category A waste might be incinerated.	• **DISINFECTED RECYCLABLE MEDICAL WASTE:** In the cases of hospitals and clinics (a perinatal centre, a regional hospital, a city clinic, a public children's clinic and a military hospital) that recycle some of their disinfected medical waste—either plastic or glass—such waste is recycled by their contracted companies. • **DISINFECTED NON-RECYCLABLE MEDICAL WASTE:** In all the cases, disinfected (liquid or autoclaved in the case of one regional hospital) medical waste that cannot be recycled is incinerated (this information is unknown for a military hospital and the oncology centre). • **ANATOMICAL WASTE:** In the cases of hospitals and clinics that generate anatomical waste, it is either incinerated (by companies contracted through ProZorro for a city clinic, a regional hospital and a military hospital, or in a perinatal centre's own incinerator used for the purpose of this hospital only) or buried (another regional hospital).	

The social impact of HCWM practices in selected hospitals and clinics that looked at gender, social inclusion and workplace safety and labour rights, as well as health risks for the community (surrounding areas), suggests that most of the hospitals interviewed consider only some of these aspects in their practices—i.e. providing regular training for their HCWM staff, vaccinating the staff and providing minimum bonuses for the work they perform. Social inclusion, gender equality and health risks for the community living in surrounding areas are ignored in almost all cases, partially because of the absence of any legal requirement to consider these aspects or effective enforcement of such requirements, and partially because of insufficient awareness among hospital staff of how these issues might affect their HCWM practices.

An economic impact assessment looked at HCWM finance and procurement practices and concluded that HCWM is financed as a residual activity at the hospital level and there is a trade-off in how resources are allocated. The inexistence of a separate line of financing for HCWM in hospital budgets negatively impacts the selection of a waste treatment company, with cost being the main criterion, the provision of adequate HCWM measures and equipment, and the use of more sustainable waste treatment technologies. Moreover, it influences the amount of waste that is declared for disposal, given that waste management is a costly service.

An environmental impact assessment looked at policies and regulations, and their compliance with national legislation and international minimum standards, as well as potential environmental risks from current HCWM practices. While the hospitals and clinics interviewed comply with some of the national requirements, their practices should be improved at each step of the HCWM flow diagram—from waste generation to its final treatment off site—and the responsibilities for final treatment should be clearly defined between HCFs and waste management companies.

Based on this assessment, conclusions are offered on such aspects of the HCWM system as policy and legislation, financing, procurement practices, on-site and off-site HCWM practices, and social considerations. The overall conclusion is that the Ukrainian HCWM system needs reform, covering its legislation and its approximation with EU waste directives and international environmental conventions and the financing of the system at both national and hospital level. As far as individual hospital practices are concerned, hospital staff responsible for waste management lack sufficient training, education and financial resources to improve their practices, even though motivated staff are present in almost all the hospitals interviewed and seek to make their HCWM policies more sustainable.

Recommendations for the improvement of the HCWM system in Ukraine include both the legislation and policy level, and HCWM practices of individual hospitals.

Based on international minimum standards and the experience of countries such as Lithuania, on the strategic level it is recommended to develop a legal framework for the HCWM system that will ensure a clear sharing of responsibilities for state authorities, with the MOH responsible for on-site HCWM regulations and control (within HCFs), and the MOEEP responsible for off-site HCWM regulations and control (outside HCFs). Recommendations are provided to develop the HCWM system to conform to best international standards and practices.

As far as recommendations for HCFs are concerned, some of them are only possible once the HCWM system is set up and structured at the national level—such as the establishment of a separate budget line for HCWM and the organization of training tailored to HCWM—while others, such as the assignment of motivated staff responsible for HCWM, the use of dedicated storage facilities for the temporary storage of HCW before transportation off site for final treatment, and more initiative from senior management to look for alternative financial resources to bridge the gaps in the HCWM budget, can be established in parallel with the changes in legislation and policies at the national level.

Additionally, the researchers recommend that UNDP initiate pilot programmes to improve HCWM

practices in some hospitals and clinics to set an example for future interventions in this field at the HCF level.

3. METHODOLOGY AND SCOPE OF THE PROJECT

The main objective of this research is to conduct a social, economic and environmental impact assessment of the current HCWM practices in Ukraine with a sample of at least six or seven hospitals and clinics in Kyiv City, Odesa City, Mariupol City and Lviv City (at least two hospitals and clinics of different size and type in each target city or region) through direct surveillance (site visits/polling/key informant interviews and focus group discussions) and a desk review of the national waste management policies and hospitals' and clinics' practices to analyse the current situation of HCWM practices in Ukraine, as well as the status of implementation of national legislation in hospitals and clinics and the extent to which it conforms to internationally accepted standards.

3.1. SAMPLING OF HOSPITALS AND CLINICS

According to the main objective of the research, the social, economic and environmental impact assessment of HCWM practices in Ukraine was conducted with a sample of eight hospitals and clinics in four regions of Ukraine: Kyiv City, Odesa City, Mariupol City and Lviv City.

FIGURE 1. CITIES VISITED FOR HOSPITAL AND CLINIC INTERVIEWS

Source: CIVITTA

Based on the literature review and suggestions provided by the UNDP team in Ukraine, certain criteria were considered when compiling convenience sampling of hospitals and clinics to be visited (see Table 1).

TABLE 1. CRITERIA FOR THE CONVENIENCE SAMPLING OF HOSPITALS AND CLINICS

CRITERIA	EXPLANATION
SIZE	The size of the hospital is usually measured by the number of patients served and the range of services provided. In Ukraine, the size of the population the hospital serves would be reflected in the location of the hospital: village, city, district, oblast (region).[4]
PROFILE	According to Ukrainian regulations,[5] medical establishments (different from ambulatories, establishments for blood transfusion and emergency aid, and sanatoria) can be classified based on the number of functions they perform within the establishment: • Multiple profile (e.g. children's hospital) • Single profile (e.g. oncology centre) • Specialized (e.g. ophthalmology hospital) • Medical establishments of special type (e.g. regional children's pathology-anatomy bureau).
LEVEL OF HEALTH CARE SERVICES	According to Ukrainian law,[6] health care institutions can also be categorized by the level of health care services: • Emergency • Primary • Secondary • Tertiary.
OWNERSHIP	For the purpose of this research, the researchers looked at both private and public health care institutions.
ON-SITE WASTE TREATMENT INSTALLATIONS	To record a range of HCWM practices in Ukrainian hospitals and clinics, the researchers looked at some hospitals and clinics that have on-site waste treatment installations (autoclaves, incinerators and other treatment installations) and some that do not.

Additionally, the researchers tried to capture hospitals and clinics that had different categories of waste (A, B, C and D) as defined by the Decision of the Ministry of Health of Ukraine 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management' (2015).[7]

Given these criteria, eight hospitals and clinics in total were visited and interviewed by the researchers. These hospitals and clinics meet the criteria set by the UNDP team and additional literature review. This is a convenience sampling and should not in any way be construed as representative of all health care institutions in Ukraine. However, it allowed researchers to see the range of HCWM practices and make conclusions on ways to improve them in terms of both legislative and operational perspectives. Table 2 lists the hospitals and clinics visited and their characteristics, with their names hidden for security purposes.

[4] Ministry of Health of Ukraine, Decree 'On the Approval of the List of Health Care Institutions, Medical and Pharmaceutical Positions, Positions for Junior Specialists with Pharmaceutical Education, Position of Professionals in Health Care and Specialists in Health Care in Health Care Institutions', Kyiv, 2002, <https://zakon.rada.gov.ua/laws/show/z0892-02>.
[5] Ibid.
[6] Verkhovna Rada of Ukraine, Law of Ukraine 'On Amendments of the Basics of the Healthcare Legislation on Improving the Provision of Medical Help', Kyiv, 2017, <https://zakon.rada.gov.ua/laws/show/2204-19>.
[7] Ministry of Health of Ukraine, Decision 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management', Kyiv, 2015, <https://zakon.rada.gov.ua/laws/show/z0959-15>.

TABLE 2. LIST OF HOSPITALS AND CLINICS INTERVIEWED

HOSPITAL NAME	DATE OF VISIT	CITY	SIZE	PROFILE	LEVEL OF HEALTH CARE SERVICES	OWNERSHIP	WASTE TREATMENT INSTALLATION ON SITE
City clinic	7 October 2019	Kyiv	City	Multiple	Tertiary	Public	No
Regional hospital	8 October 2019	Odesa	Regional	Multiple	Tertiary	Public	Yes, autoclaves
Children's clinic	8 October 2019	Odesa	City	Multiple	Primary and secondary	Public	No
Regional hospital	11 October 2019	Mariupol	Regional	Multiple	Tertiary	Public	No
Perinatal centre	11 October 2019	Mariupol	City	Specialized	Secondary	Public	Yes, incinerator
Children's clinic	15 October 2019	Lviv	City	Specialized	Primary	Private	No
Military hospital	15 and 25 October 2019	Lviv	Regional	Multiple	Tertiary	Public, under the Ministry of Defence of Ukraine	No
City oncology centre	21 October 2019	Kyiv	City	Specialized	Tertiary	Public	Not disclosed

3.2. DATA COLLECTION PROCEDURES AND TOOLS

Data collection and assessment tools were selected based on the initial literature review on HCWM, including national legislation and international guidelines. Considering the scope and the duration of the project, a comprehensive questionnaire to be filled out during site visits to hospitals and clinics was selected as a main data collection tool. This questionnaire (see Annex 1) consists of several parts that cover the following topics on HCWM practices in an individual hospital: staff and training; protective measures; waste management policy and legislation; procurement policy and budget; minimization, reuse and recycling policy; segregation, collection, storage and transportation; treatment and disposal; and social considerations.

Filled out by the interviewers during in-depth personal interviews with key hospital staff, the questionnaire allowed researchers to map out HCWM flow diagrams in selected hospitals and clinics and receive data about key social, economic and environmental considerations, the impact of which is assessed in this report.

To develop a comprehensive understanding of the current HCWM practices in selected Ukrainian hospitals and clinics, site visits, interviews with key hospital staff and a focus group discussion were selected as the main research activities.

SITE VISITS | Eight site visits were conducted to (1) interview key hospital personnel responsible for HCWM procedures and request internal documents and regulations governing HCWM processes; and (2) take hospital tours to obtain a first-hand view of the real situation of HCWM and see the processes of HCW generation and segregation at generation points, its pretreatment and temporary storage at the HCF before transportation off site and any other treatment on site.

INTERVIEWS WITH KEY HOSPITAL PERSONNEL | In-person interviews during site visits to hospitals and clinics were chosen to collect information about HCWM challenges faced by the hospitals and clinics from the perspective of people responsible for the processes, as well as to understand whether hospital staff consider any social, economic and environmental aspects when they plan their procurement and HCWM policies. Direct contact with key hospital staff gave researchers a more comprehensive view of the real situation and hospitals' and clinics' current challenges and opportunities in HCWM practices.

FOCUS GROUP DISCUSSION | To bridge information gaps resulting from site visits to selected hospitals and clinics and interviews with hospital representatives, a focus group discussion was held on 29 October 2019 to (1) cross-check initial findings from visits to eight selected hospitals with other key stakeholders; and (2) shed light on additional challenges and opportunities of the HCWM system in Ukraine by identifying its key problems and generating possible solutions to address them together with the main stakeholders in the HCWM system in Ukraine. To achieve these objectives, systemic consensus and design thinking methodologies were used, respectively. Given the structure of the HCWM system in Ukraine, the researchers broadly identified the following key stakeholder groups: hospitals and clinics; authorities; private and public waste treatment companies; non-governmental organizations; and international organizations.

In total, 18 of the 45 people invited took part in the focus group discussion; they represented all five of the stakeholder groups.

The combination of the above-mentioned activities led to a triangulation effect in this qualitative research and increased the credibility and validity of its results.

3.3. EVALUATION PROCEDURES

Several evaluation procedures were used to summarize the findings of the report and give recommendations on how to improve current HCWM practices and Ukraine's legislation and policies in this field.

HCWM FLOW DIAGRAM | Based on the observations during the site visits and interviews with the hospital representatives, a flow diagram was developed to summarize the key steps of HCWM practices in selected hospitals and clinics, ranging from the generation of HCW to its final treatment/disposal either on site at the facility or off site. The chosen convenience sampling method allowed researchers to look at hospitals and clinics of different sizes, level of health care services and geographical location, and obtain responses from personnel representing different departments (budgeting, procurement, medical practice) to gain different perspectives of the same issues.

SOCIAL, ECONOMIC AND ENVIRONMENTAL CONSIDERATIONS | An impact assessment of social, economic and environmental considerations summarizes the results of the research in the following descriptive way:

- Based on the answers provided by hospital representatives, the answers to key research questions summarized at the beginning of each section in Chapter 5.2 were assessed to understand to what extent hospitals and clinics consider social, economic and environmental aspects in planning, executing and budgeting for their procurement procedures, HCWM practices and overall management of a hospital.
- The assessment also included the reasons why some of the hospitals and clinics consider social, economic and environmental aspects in their HCWM practices, and why some do not. This helped the researchers understand what precludes hospitals and clinics from considering these aspects—be it the lack of desire to do so by the hospital management, legislative pitfalls, insufficient budget, infrastructure or other reasons.

3.4. RESEARCH LIMITATIONS

While the methodology of this qualitative research combined site visits and interviews in selected hospitals and clinics with a focus group discussion with key stakeholders in the HCWM system to achieve a triangulation effect, as with any research, this research has its limitations.

SELECTION OF HOSPITALS AND CLINICS | The HCFs interviewed for this research met the criteria described in Chapter 3.1, but their selection was based on their willingness to participate in the research. Thus, this sample excludes the HCFs that would not otherwise agree to disclose information on their HCWM practices. Moreover, one of the HCFs interviewed that has Category D waste refused to disclose information on its practices during the visit; therefore, the practices of HCFs that generate Category D waste could not be analysed.

FOCUS GROUP DISCUSSION RESULTS | Although the focus group discussion sought to fill in the gaps in the understanding of HCWM practices in Ukrainian HCFs through inputs from other stakeholders involved in the system, and partially did so by including representatives of hospitals and clinics, authorities, public and private waste treatment companies, non-governmental organizations and international organizations, not all those invited to participate actually attended (18 out of 45); thus, inputs from some of the stakeholders are not included in this report.

DATA GAPS | As foreseen at the beginning of the research activities, very few of the HCFs interviewed have waste accounting and reporting records available for the researchers to be able to apply any quantitative measures to evaluate their HCWM practices. The assessment of social, economic and environmental considerations is qualitative and is based on the estimates of the hospital representatives interviewed.

With these limitations in mind, the research provides baseline qualitative data on HCWM practices in the eight HCFs interviewed, and assesses the impact of such practices.

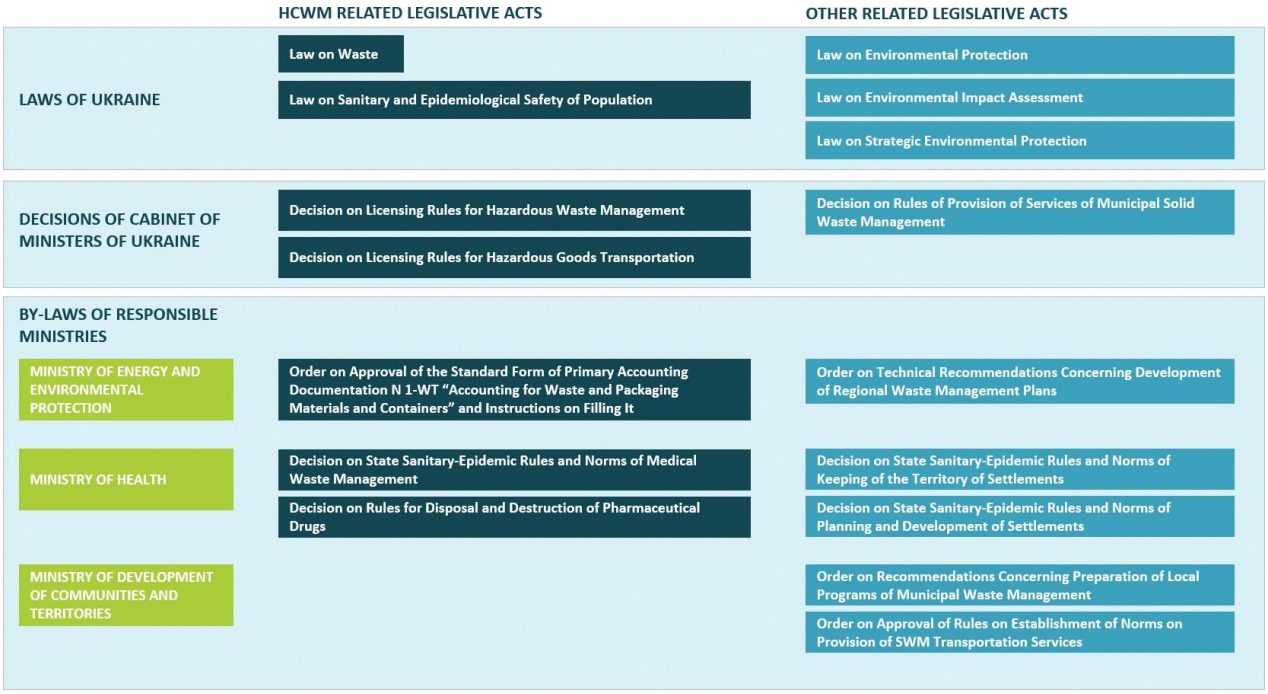
4. LEGISLATION AND POLICIES

4.1. REVIEW OF UKRAINIAN NATIONAL LEGISLATION AND POLICIES ON HEALTH CARE WASTE MANAGEMENT

Currently, a key driver of changes in Ukraine's waste management sector is the EU–Ukraine Association Agreement, which obliges Ukrainian national legislation to conform to EU legislation. While the Agreement specifies the list of six Directives (see Table 4) that must be approximated by Ukraine and the deadlines for this process, Ukraine is behind schedule, and a couple of important draft laws[8] on waste management are awaiting adoption by Parliament. Key national strategic planning documents in waste management were approved over the past few years.

Annex 2 provides a list of all the Ukrainian national legislative acts concerning waste management and HCWM, while Table 4 summarizes key national strategic planning documents as well as the Decision of the Ministry of Health 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management' as of 8 June 2015, which drives HCWM practices at hospital level. Figure 2 lists the by-laws and other legislative acts adopted by authorities responsible for HCWM in Ukraine.

FIGURE 2. LEGISLATIVE ACTS COVERING HCWM ADOPTED BY AUTHORITIES IN UKRAINE



Responsibilities in the waste management system (including HCWM) are shared between a number of state institutions, with two key ministries[9]—the MOEEP and the MOH—involved in the regulation of general waste management, and specifically HCWM.[10] Currently, no definite structure for sharing

[8] Specifically, the Draft Law on SMW and Other Waste Management #2207 (2019), Draft Law on Waste Management #2207-1 (2019), Draft Law on Waste #2207-2 (2019), Draft Law on Batteries and Accumulators #2352 (2019) and the Draft Law on Waste Electrical and Electronic Equipment (WEEE) #2350 (2019).

[9] Verkhovna Rada of Ukraine, Law of Ukraine 'On Waste', Kyiv, 1998, <https://zakon.rada.gov.ua/laws/show/187/98-%D0%B2%D1%80>; Verkhovna Rada of Ukraine, Law of Ukraine 'On Sanitary and Epidemiological Safety of Population', 1994, <https://zakon.rada.gov.ua/laws/anot/4004-12>.

[10] As of 29 August 2019, the Ministry of Development of Regions and Communities of Ukraine (formerly the Ministry of Regional Development, Construction and Amenities) is responsible for setting norms and standards in the sphere of municipal waste management.

responsibilities between institutions is in place. In some cases, responsibilities are overlapping (e.g. control and supervision of waste management activities). The Draft Law on Waste Management registered in Parliament on 2 July 2019[11] foresees the creation of a special central executive authority, the Waste Management Agency.

The waste management planning process consists of the use of different procedures at different levels—national, regional and local, and individual levels (waste producers):

NATIONAL LEVEL | At the national level, the HCWM is governed by the National Waste Management Strategy until 2030 and the National Plan for Waste Management in Ukraine until 2030, described in Table 3.

REGIONAL LEVEL | There is a requirement for Oblast State Administrations to develop Regional Waste Management Plans (RWMP), but the Draft Law on Waste Management regulating their development and approval has not yet been passed by Parliament. Recommendations of the Ministry of Environment to develop such RWMPs are based on the provisions of Directive 2008/98/EC (see Table 4), and they outline the structure of such plans, list the waste categories to be covered and determine that RWMPs must be developed by the end of 2019.

LOCAL LEVEL | The Law of Ukraine 'On Waste'[12] foresees the development and approval of Schemes of Sanitary Cleaning of Settlements and Local and Regional Waste Management Plans by local self-government authorities. The main task of the schemes is to define the priority of activities on sanitary cleaning, their volumes, systems and methods of municipal waste management, the number of waste vehicles needed for collection and transportation, the amount of cleaning equipment, the prospects of planning and building new municipal waste management facilities and their location, and the necessary financial resources. Municipalities usually either do not have waste management schemes or programmes in force, or waste management is covered by one broad environmental protection programme.[13]

INDIVIDUAL LEVEL (WASTE PRODUCERS) | The Law of Ukraine 'On Waste' states that commercial waste producers must develop Plans of Waste Management Activities. This requirement is not further clarified by by-laws or regulations, and the monitoring bodies do not usually check their existence.

The planning of locations for waste management facilities or infrastructure is performed through the municipal planning process, including legislative documents such as a general plan, a zoning plan and a detailed plan of the territory. These documents are approved by local municipalities and are subject to Strategic Environmental Assessments. The planning of construction of specific waste management facilities is subject to permission procedures and Environmental Impact Assessments (EIA). Any activities dealing with hazardous waste (storage, treatment, recycling, disposal, landfill) and activities dealing with solid municipal waste (SMW) and other types of waste exceeding a daily level of 100 tons are subject to an EIA.[14]

WASTE MANAGEMENT COMPANIES

As far as off-site waste management is concerned, it is not clear which authority is responsible for the planning and creation of an HCWM system (including infrastructure) at the national level. According to the National Plan for Waste Management in Ukraine until 2030, two ministries—the

[11] Draft Law on Waste Management #2207-1, 2019, <http://w1.c1.rada.gov.ua/pls/zweb2/webproc4_1?pf3511=67094>.
[12] Verkhovna Rada of Ukraine, Law of Ukraine 'On Waste', Kyiv, 1998, <https://zakon.rada.gov.ua/laws/show/187/98-%D0%B2%D1%80>.
[13] Environment. People. Law, 'Analysis of Regional Waste Management Plans', Lviv, 2019, <http://epl.org.ua/wp-content/uploads/2019/07/2533_EPL_Analituchnuy_zvit_vidhodu_NET.pdf>.
[14] Verkhovna Rada of Ukraine, Law of Ukraine 'On Environmental Impact Assessment', Kyiv, 2017, <https://zakon.rada.gov.ua/laws/show/2059-19>.

MOH and the MOEEP—are assigned to make an inventory of medical waste management facilities, evaluate their existing capacities and create the necessary infrastructure by 2030.

Currently, the MOEEP operates a Registry of Licensed Companies for Hazardous Waste Management that has around 360 license holders for hazardous waste management.[15] Among them are more than 50 licensed organizations with an active licence to manage medical waste and more than 30 licensed organizations that have had their licence cancelled. Among those 50 licensed organizations, some are only allowed to collect and store hazardous medical waste, and some are only allowed to transport it. These companies are unlikely to be managing medical waste in an environmentally safe manner, as they do not offer a full cycle of waste operations from collection to disposal (see Annex 3).

According to the Registry, companies that are allowed (and should have the equipment) to incinerate medical waste are located in only 12 regions in Ukraine, thus covering only half of the regions. Some of these companies are known to operate outside the region where they are registered, but the economic feasibility of such activities is questionable. Information about the capacities, technologies and other documents of such companies is not publicly available. In addition, companies that have incinerators are incinerating not only medical waste but other types of hazardous waste that are mentioned in their licensing documentation, thus it is complicated to calculate whether their capacities for processing medical waste are accurate.

FINANCING OF THE HCWM SYSTEM

All public HCFs in Ukraine are financed from either state or municipal budgets. The allocation of financial resources for HCWM is performed on an annual basis and comes from the 'services' budget line, which also includes utilities, repairs and other services. The amount of financial resources planned for the next year and actually obtained differs. The shortfall in financial resources needed for HCWM could be allocated from other sources based on individual hospital practices, including:

- a special fund in a hospital generated from payments made by patients for medical services;
- a charity fund created within or outside a hospital; and
- the National Health Service of Ukraine provides financial support to hospitals and clinics directly, and some funding could be used to finance waste management.

An assessment of the finance system is described later in the report.

PROCUREMENT LEGISLATION

The Law of Ukraine 'On Public Procurement' (2019)[16] should be applied to transactions for goods or services exceeding UAH200,000 and works exceeding UAH1,500,000. If the amount of a transaction is lower, the parties must follow the principles of procurement and can use electronic procurement systems to select the provider of goods/services. If an electronic procurement system is not used and the amount of the transaction is between UAH50,000 and UAH200,000, buyers must make any agreements concluded publicly available in the electronic procurement system. The buyer must also make publicly available any information on the transaction on authorized electronic platforms such as ProZorro, e-tender and many others. The ProZorro portal is an open resource offering access to all information from a central database on electronic tenders.

Article 28 of the Law 'On Public Procurement' foresees that there are two criteria for the evaluation of tender proposals: price (if a tender is not based on tailor-made specifications) and price and other criteria (if a tender refers to complex or specialized issues—scientific, experimental, consultancy etc.).

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[15] Ministry of Energy and Environmental Protection, 'Registry of Licensed Companies for Hazardous Waste Management', Kyiv, 2019, <https://menr.gov.ua/content/perelik-licenziativ-na-provadzhennya-gospodarskoi-diyalnosti-z-povodzhennya-z-nebezpechnimi- vidhodami.html>.

[16] Verkhovna Rada of Ukraine, Law of Ukraine 'On Public Procurement', Kyiv, 2019, <https://zakon.rada.gov.ua/laws/show/922-19/paran74>.

An assessment of the procurement procedures used by the HCFs interviewed is analysed later in the report.

ACCOUNTING AND REPORTING

According to Ukrainian legislation[17] and depending on the annual amount of waste (PZYV),[18] HCFs must prepare Form 1-Waste on the amount of waste they generate and submit it annually to the State Statistical Service of Ukraine. Waste management companies must also prepare this form for the amount of waste managed by the company annually and submit it to the State Statistical Service. However, these accounting and reporting obligations are not being properly implemented by either HCFs or waste management companies in Ukraine, given that the number of annual reports submitted if very low. Besides, the penalties for not complying with this requirement are very low,[19] and there is no publicly available registry to obtain these reports.

According to data from the State Statistical Service, in 2016 only 607 HCFs submitted statistical reports on waste; in 2017, 611; in 2018, 604.[20] The data in these statistical reports suggest that approximately 700–1,000 tons of HCW has been generated by Ukrainian HCFs annually over the last three years, and the reported amount of waste is increasing, while the number of HCFs that provide data is almost the same. The data from the State Statistical Service suggest that the vast majority of HCW in Ukraine is incinerated: in 2018, 1,089 tons of HCW was incinerated, 75 tons was landfilled, and 67 tons was recovered.

That said, the accuracy of the data is questionable, given that the reported amount of HCW generated is lower than the total amount of HCW treated. Unofficial figures suggest that nearly 380,000–400,000 tons of HCW might be generated annually in Ukraine.[21] It is very likely that this waste goes to numerous illegal landfill sites around the country.[22]

GENDER

The equality of rights and opportunities of women and men in Ukraine is mostly governed by two key documents: the Constitution of Ukraine (Article 24) and the Law of Ukraine 'On Ensuring Equal Rights and Opportunities of Women and Men' (2005).[23] The Law defines equal rights and opportunities, discrimination and other related terms, and highlights the main directions of national policy and responsibilities of government institutions on this issue. It states that institutions and organizations that exist in Ukraine should "encourage balanced representation of genders in the management and decision-making process" using positive actions.[24]

The prevention of discrimination in Ukraine, particularly in terms of gender, is also governed by the Constitution of Ukraine, the above-mentioned Law 'On Ensuring Equal Rights and Opportunities of Women and Men' and the Law of Ukraine 'On Principles of Prevention and Combating Discrimination in Ukraine' (2012).[25] The latter two legislative acts prohibit discrimination based on

[17] State Statistical Service of Ukraine, Order 'On Approval of Forms for State Statistical Monitoring in Ecology, Forestry and Hunting', Kyiv, 2014, <https://zakon.rada.gov.ua/rada/show/v0243832-14>.
[18] PZYV, the measure of the volume of waste generation, is calculated according to the following formula: (5,000 x M1) + (500 x M2) + (50 x M3) + (1 x M4), where M is the volume of waste in tons, and 1, 2, 3 and 4 are the hazard classes of waste generated in the previous year.
[19] According to Article 82-1 of the Code of Administrative Violations of Ukraine, a current fine is about UAH51–85 (equivalent to USD2–3). In comparison, Lithuanian fines for infringement of such requirements are much higher, ranging from EUR120–850 for administrative offences to EUR150–1,400 for legal entities.
[20] In 2017, 1,700 hospitals and 10,400 outpatient clinics operated in Ukraine (excluding private ones).
[21] Environment. People. Law, 'Disposal of Medical Waste: Good Intentions or Traps for the Society', Lviv, 2013, <http://epl.org.ua/announces/utylizatsiia-medychnykh-vidkhodiv-blahorodna-tsil-chy-zavualovanyi-kapkan-dlia-dovkillia/>.
[22] Cabinet of Ministers of Ukraine, 'National Waste Management Strategy until 2030', Kyiv, 2017, <https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80>.
[23] Verkhovna Rada of Ukraine, Law of Ukraine 'On Ensuring Equal Rights and Opportunities of Women and Men', Kyiv, 2005, <https://zakon.rada.gov.ua/laws/show/2866-15>.
[24] Ibid.
[25] Verkhovna Rada of Ukraine, Law of Ukraine 'On Principles of Prevention and Combating Discrimination in Ukraine',

gender and provide for mechanisms to report cases of discrimination. The laws are based on international conventions and agreements to which Ukraine is a signatory, including the Universal Declaration of Human Rights (1948), the Convention on the Elimination of All Forms of Discrimination against Women (1979), International Labour Organization Conventions 100, 103, 111, 156, 182 and 183, and others.[26] Additionally, the EU–Ukraine Association Agreement (2014) entails a commitment to ensure equal opportunities for women and men in employment, education, training, the economy, society and decision-making.[27]

SOCIAL INCLUSION (ACCESSIBILITY)

For the purposes of this research, social inclusion was considered from the point of view of social assistance (see Chapter 5.2.1 for details), and the accessibility of social infrastructure to persons with disabilities. The right to unhindered access to social infrastructure (including HCFs) is guaranteed by the Constitution of Ukraine, the Law of Ukraine 'On the Basics of Social Protection of Persons with Disabilities in Ukraine' (1991)[28] and the State Building Standards of Ukraine. These legislative acts are based on the international conventions to which Ukraine is a signatory, including the United Nations Convention on the Rights of Persons with Disabilities (2006), which Ukraine ratified in 2009.

According to these laws and regulations, all institutions and organizations—regardless of their ownership status (public or private)—are responsible for making their buildings and services accessible to persons with disabilities. The new State Building Standards on Inclusivity of Buildings and Constructions (2018)[29] contain technical specifications for inclusive infrastructure to be provided for new constructions as well as existing buildings and constructions. The State Building Standards for Health Care Facilities (2010)[30] also mention the requirement for HCFs to be accessible to persons with disabilities, including the restructuring of a building if it is not accessible. However, while the legislative basis for resolving accessibility issues exists—in the form of State Building Standards—the problem of actually making the existing building stock accessible is unresolved.[31]

LABOUR RIGHTS AND WORKPLACE SAFETY

For the purposes of this research, such aspects as salaries and bonuses, personal protective measures, vaccination, and training on HCWM were considered as related to social considerations on labour rights and workplace safety. The Labour Code of Ukraine (1971)[32] regulates labour relations in Ukraine. When it comes to salaries and bonuses, the Labour Code describes how they are formed (including the definition of a 'salary scale') and allocated, and states that when performing work in dangerous or hazardous conditions, employees are entitled to additional pay. The Labour Code also obliges employers to undertake periodical workplace safety training (including onboarding ones), and to ensure that employees are working in healthy and safe conditions (including the instruments and tools needed for their work).

The Decision of the Ministry of Health 'On State Sanitary-Epidemic Rules and Norms of Medical

Kyiv, 2012, <https://zakon.rada.gov.ua/laws/show/5207-17>.

[26] Razumkov Centre, 'Gender Equality and Development: Overview in the Context of European Strategy of Ukraine', Kyiv, 2016, <http://razumkov.org.ua/images/broshura/Gender-FINAL-S.pdf>.

[27] United Nations Ukraine, 'Gender Equality', <http://www.un.org.ua/en/resident-coordinator-system/gender-equality>.

[28] Verkhovna Rada of Ukraine, Law of Ukraine 'On the Basics of Social Protection of Persons with Disabilities in Ukraine', Kyiv, 1991, <https://zakon.rada.gov.ua/laws/show/875-12>.

[29] State Buildings Standards of Ukraine, 'Inclusivity of Buildings and Constructions', Kyiv, 2018, <http://dreamdim.ua/wp-content/uploads/2019/03/DBN-V2240-2018.pdf?fbclid=IwAR1JdAz8LzXLoPkZBMBPjGjh0NtsmogmuXm-x6d4qMQcLaEfbxMWbBdyPA8>.

[30] State Buildings Standards of Ukraine, 'Health Care Facilities', Kyiv, 2010, <https://dbn.co.ua/load/normativy/dbn/v_2_2_10/1-1-0-1805>.

[31] Kharkiv Human Right Protection Group, 'Comprehensive Research on the State of Human Rights in Ukraine', Kharkiv, 2014, <http://khpg.org/index.php?id=1398060143>.

[32] Verkhovna Rada of Ukraine, 'Labour Code of Ukraine', Kyiv, 1971, <https://zakon.rada.gov.ua/laws/show/322-08>.

Waste Management' (2015)[33] provides for more specific legal requirements for HCFs in the field of HCWM and specifically labor rights and workplace safety. The Decision requires training on HCWM during on-boarding and annually afterward, as well as compulsory medical examination prior to being involved in HCWM. The Decision also requires the staff that deals with HCWM to be provided with all necessary personal protective measures.

[33] Ministry of Health of Ukraine, Decision 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management', Kyiv, 2015, <https://zakon.rada.gov.ua/laws/show/z0959-15>.

TABLE 3. REVIEW OF KEY NATIONAL LEGISLATIVE ACTS ON WASTE MANAGEMENT AND HCWM

NAME OF LEGISLATIVE DOCUMENT	SHORT OVERVIEW	KEY TAKEAWAYS
Decision of the Cabinet of Ministers of Ukraine 'On Approval of the National Strategy for Waste Management in Ukraine until 2030'	Adopted on 8 November 2017, the Strategy outlines the main directions of state regulation of waste management in Ukraine for the next 10 years in line with key EU Waste Directives (see Table 4 for details), and focuses on SMW, industrial waste, construction waste, hazardous waste, agricultural waste, packaging waste, waste electrical and electronic equipment, waste batteries and accumulators, and HCW. It also identifies the following principles in waste management: • Hierarchy of waste management (see Figure 3) • Transformation to a circular economy • Proximity • Precaution • Joint responsibility of all stakeholders during decision-making • Extended producer responsibility **FIGURE 3. WASTE HIERARCHY**  Source: UNDP (2015)[34]	**KEY PRINCIPLES IN HCWM** • Priority protection of the environment and human health against the adverse effects of waste • Ensuring reduced use of raw materials and energy resources • Scientifically grounded accommodation of ecological, economic and social interests of society concerning generation and use of waste to ensure its sustainable development. **KEY PROBLEMS IN HCWM** • Low level of HCWM practices in HCFs • Lack of areas and means for temporary storage and transportation within HCFs • Lack of possibilities to purchase HCW treatment equipment. As a result, the majority of HCW is taken to illegal dumpsites due to the lack of responsibility of medical personnel and the lack of necessary equipment for handling and disposal of HCW. The limited financial resources of HCFs also play a key restrictive role. **KEY MEASURES IN HCWM** • Adoption of legislation on effective reporting, permitting procedures and minimization of HCW • Introduction of separate collection of HCW in at least three streams: safe HCW waste similar to SMW, infectious waste and pharmaceutical waste • Creation of infrastructure for temporary storage and transportation of HCW, as well as a complex national system of handling of waste (preliminary treatment and high-temperature incineration) with the banning of landfilling, chemical and microwave treatment, incineration of HCW in cement kilns and at thermal power plants.

[34] UNDP, 'Healthcare Waste Management Toolkit for Global Fund Practitioners and Policy Makers: Waste Stream Concept Development', New York, 2015, <https://www.eurasia.undp.org/content/dam/rbec/docs/UNDP Waste Toolkit Part B_web.pdf>.

NAME OF LEGISLATIVE DOCUMENT	SHORT OVERVIEW	KEY TAKEAWAYS
Decision of The Cabinet of Ministers of Ukraine 'On Approval of the National Plan for Waste Management in Ukraine until 2030'	Adopted on 20 February 2019, the Plan fixed the dates for implementation of certain general and specific measures and activities related to waste management.	**ADDITIONAL MEASURES** • Development of the by-law on the main requirements concerning storage, collection, transportation and treatment of HCW • Inventory of HCW treatment • Needs assessment for expanding existing facilities for HCW treatment • Creation of infrastructure for the collection and treatment of HCW.
Law of Ukraine 'On Strategy of State Environmental Policy of Ukraine until 2030'	Adopted on 28 February 2019 and coming into force on 1 January 2020, the Law outlines the main problems relating to water pollution by waste and waste management in Ukraine and mentions the reasons why medical and other types of waste are posing a threat to the environment and human health, among them inadequate legislation and an inefficient waste reporting, accounting and monitoring system.	
Decision of the Ministry of Health 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management'	Adopted on 8 June 2015, this Decision (otherwise known as 'Law #325') serves as a main reference document on HCWM for HCFs. The document gives the definition of HCW and its categories, and sets a legislative basis for key requirements in HCWM at hospital level that include: • Preparation and approval of an HCWM scheme • Staff training • Proper waste sorting, labelling, packing and temporary on-site storage • On-site disinfection of waste • Selection of waste management company for off-site treatment of waste • Waste accounting and reporting. The assessment of whether HCFs comply with these requirements is assessed in Chapter 5 of this report, and detailed requirements are provided in Annex 4.	**MEDICAL WASTE:** Waste generated during the provision of medical services in facilities licensed for commercial medical practice (except for facilities producing pharmaceutical goods and medical waste generated by households). Medical waste is divided into four categories: • **CATEGORY A:** Epidemically safe medical waste, similar to SMW, such as food waste from all departments of the HCF except infectious; waste that did not have contact with biological liquids of patients, infectious and dermatovenerological patients; SMW (including bulky waste, construction waste) from all the departments, except infectious. • **CATEGORY B:** Epidemically unsafe medical waste, such as used medical instruments, objects stained with blood or other biological liquids, organic medical waste of patients, food waste from the infectious department, laboratory waste. • **CATEGORY C:** Toxicologically unsafe medical waste, such as pharmaceuticals, diagnostic and disinfection items, batteries, goods and equipment containing mercury or heavy metals, waste generated as a result of the operation of equipment, transport and lighting systems. • **CATEGORY D:** Radiologically unsafe medical waste generated as a result of the use of radioisotopes for medical or scientific purposes which exceeds permissible levels of radiological safety.

TABLE 4. REVIEW OF EUROPEAN UNION DIRECTIVES MENTIONED IN UKRAINE'S 'NATIONAL STRATEGY FOR WASTE MANAGEMENT UNTIL 2030' (2017)

DIRECTIVE	SHORT OVERVIEW
European Parliament and Council Directive 94/62/EC of 20 December 1994 on packaging and packaging waste	The Directive sets out measures and requirements for the prevention, reuse and recovery of packaging waste in Member States. It seeks to harmonize national measures concerning the management of packaging and packaging waste to provide a high level of environmental protection and ensure the functioning of the internal market. Member States must ensure that packaging placed on the market complies with the essential requirements: to limit the weight and volume of packaging to a minimum; to reduce the content of hazardous substances; to design reusable or recoverable packaging. The Directive implies the producer responsibility principle.
Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste	The Directive is intended to prevent or reduce the adverse effects of the landfill of waste on the environment. It defines the different categories of waste (municipal waste, hazardous waste, non-hazardous waste and inert waste) and applies to all landfills. Landfills are divided into three classes: landfills for hazardous waste; landfills for non-hazardous waste; and landfills for inert waste. The Directive obliges Member States to minimize biodegradable waste to landfills, and to treat it before disposal. It also defines waste which is not to be accepted in any landfill and sets up a system of operating permits for landfill sites.
Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries (Mining Directive)	The Directive aims at minimizing negative effects on the environment and human health from the treatment and disposal of mining and quarrying waste. This extractive waste must be managed in specialized facilities in compliance with specific rules. Operators of such facilities are subject to liability in respect of environmental damage caused by their operation. Member States shall take every precaution to limit risks to public health and the environment related to the operation of extractive waste processing facilities, *inter alia* by applying the concept of 'best available techniques'.
Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators	The Directive prohibits the placing on the market of most batteries and accumulators with a certain mercury or cadmium content and establishes rules for the collection, recycling, treatment and disposal of batteries and accumulators. The aim is to cut the amount of hazardous substances—in particular, mercury, cadmium and lead—dumped in the environment; this should be done by reducing the use of these substances in batteries and accumulators and by treating and reusing the amounts that are used. The Directive implies the 'producer responsibility principle'.
Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (Waste Framework Directive)	The Directive establishes a legal framework for the treatment of waste in the EU. It sets the basic concepts and definitions related to waste management and lays down waste management principles for all other EU legislation related to waste, such as the 'polluter pays principle' and the 'waste hierarchy'. It sets the framework for waste management in Member States, including the extended producers' responsibility.
Directive 2012/19/EC of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE Directive)	This Directive aims to provide incentives to improve the design of electrical and electronic equipment to facilitate recycling. It was introduced to prevent the generation of electrical and electronic waste and to promote reuse, recycling and other forms of recovery to reduce the quantity of such waste. It shifts responsibility for WEEE to the producers, giving them the obligation to recycle electrical and electronic equipment that consumers return to them free of charge.

Source: Municipal Waste Europe (2019)

4.2. FOREIGN LITERATURE REVIEW ON HEALTH CARE WASTE MANAGEMENT GUIDELINES AND PRACTICES

While the literature on HCWM is extensive, for the purpose of this research the authors decided to concentrate on a review of international environmental conventions that directly or indirectly govern HCWM practices globally, and of key publications and guidelines from international organizations and other institutions that work in the field of HCWM or related fields.

4.2.1. INTERNATIONAL ENVIRONMENTAL CONVENTIONS

There are five international environmental conventions of explicit significance for health care procurement and waste management. As a member of a global community, and specifically the United Nations, Ukraine can take part in international conventions that set certain obligations and responsibilities to signatories to these conventions. Table 5 gives a short overview of the conventions and provides information on the status of Ukraine's participation in them.

4.2.2. PUBLICATIONS AND GUIDELINES FROM INTERNATIONAL ORGANIZATIONS

There are numerous international organizations directly or indirectly involved in HCWM, among which a key role is played by various United Nations agencies such as UNDP and UNICEF that are heavily involved in health care procurement in many countries, the United Nations Environment Programme and WHO. While all these international organizations have multiple publications that give an overview of HCWM or cover specific topics and provide general or more detailed guidelines, the publications described in Table 6 are the most comprehensive and are usually cited in other publications produced by these organizations.

TABLE 5. OVERVIEW OF INTERNATIONAL ENVIRONMENTAL CONVENTIONS AND UKRAINE'S PARTICIPATION

SHORT OVERVIEW OF THE CONVENTION	UKRAINE'S STATUS		
	ADOPTION AND ENTRY INTO FORCE	IS UKRAINE A SIGNATORY?	RATIFICATION, ACCEPTANCE (A), APPROVAL (AA), ACCESSION (a) AND ENTRY INTO FORCE
THE VIENNA CONVENTION FOR THE PROTECTION OF THE OZONE LAYER AND THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER is an international treaty that aims to phase out substances that deplete the ozone layer (Ozone Depleting Substances—ODS). It is the first international convention of any kind to achieve universal ratification. This Convention and the Protocol to it are relevant for health care procurement and HCWM because a number of ODS are still being produced and used in laboratories and the pharmaceutical industry—for example, refrigerators used for vaccines, cooling equipment for cold chambers etc.—thus it is important to first ensure that ODS-free alternatives are available for procurement or to ensure that the waste containing these substances is properly treated and disposed of.	22 March 1985 and 22 September 1988	✓	18 June 1986 (A), but it is not clear whether it has entered into force for Ukraine
THE BASEL CONVENTION ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL intends to protect human health and the environment against the adverse effects of hazardous waste. This Convention is relevant for health care procurement and HCWM because it aims to reduce the generation of waste, promote environmentally sound waste management practices and restrict the transboundary movements of hazardous waste. It lists four streams of hazardous HCW and states how it should be treated and disposed of.	22 March 1989 and 5 May 1992	✓	8 October 1999 (a) and 6 January 2000
THE STOCKHOLM CONVENTION ON PERSISTENT ORGANIC POLLUTANTS aims to protect human health and the environment from the harmful impacts of persistent organic pollutants (POPs) by eliminating and/or controlling the production, trade, use and releases of POPs. This Convention is relevant to health care procurement and HCWM because unintentional POPs (uPOPs) can be generated during the incineration of HCW. To avoid the generation of uPOPs, the Convention recommends using non-incineration technologies for waste treatment or having good-quality incinerators that meet national and international standards on uPOPs emissions.	22 May 2001 and 17 May 2004	✓	25 September 2007 and 24 December 2007
THE ROTTERDAM CONVENTION ON THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE promotes shared responsibility between exporting and importing countries in protecting human health and the environment from the harmful effects of certain hazardous chemicals and pesticides and provides for the exchange of information about such chemicals. Although the Convention does not cover pharmaceuticals and HCW, some pesticides listed in its annexes are still procured in some cases by global health organizations.	10 September 1998 and 24 February 2004	✓	6 December 2002 (a), but it is not clear whether it has entered into force for Ukraine
THE MINAMATA CONVENTION ON MERCURY is the latest international treaty designed to protect human health and the environment from anthropogenic emissions and releases of mercury and mercury compounds. It is relevant to health care procurement and HCWM because the health care industry is one of the main sources of mercury release into the atmosphere because of emissions from the incineration of HCW. This Convention calls for the procurement of mercury-free alternatives for the health care industry, as well as the implementation of appropriate HCWM solutions by 2020.	10 October 2013 and 16 August 2017	✗	Not applicable

Source: UNDP, 'Healthcare Procurement and the Compliance with International Environmental Conventions on Chemicals', New York, 2016.

TABLE 6. OVERVIEW OF COMPREHENSIVE GUIDELINES AND PUBLICATIONS ON HCWM FROM INTERNATIONAL ORGANIZATIONS

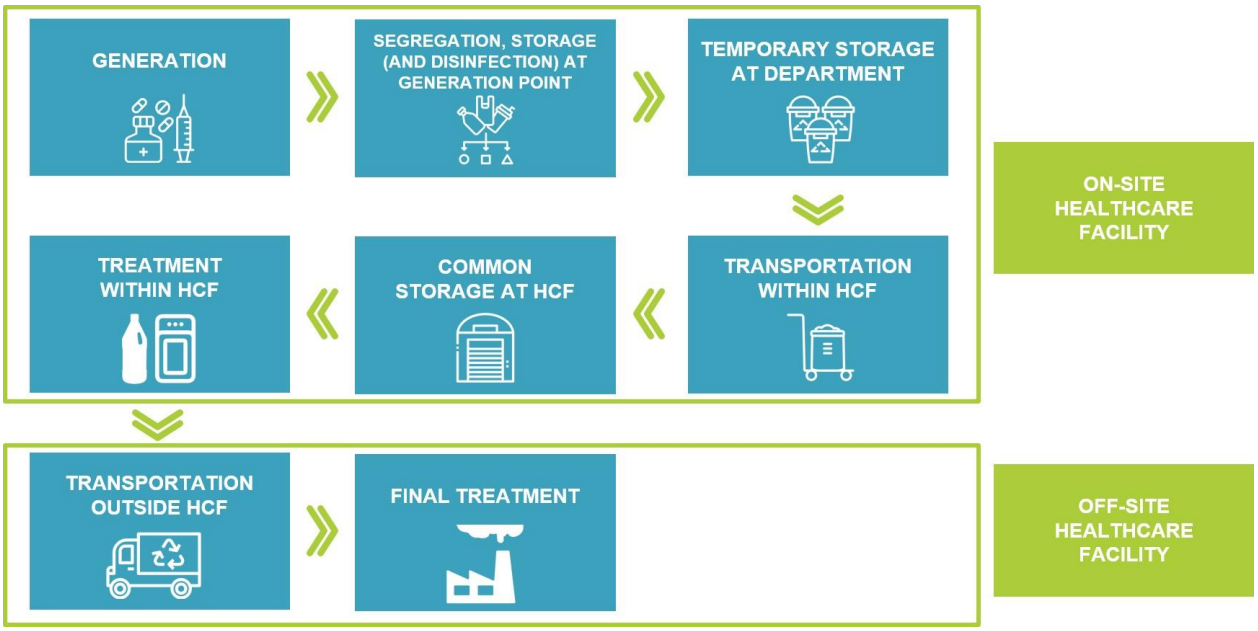
ORGANIZATION	GUIDELINES/PUBLICATIONS	SHORT OVERVIEW
WORLD HEALTH ORGANIZATION	'Safe management of wastes from health-care activities' (2014)	This handbook is a second edition of the original 'Blue Book' first published by WHO in 1999. It aims to provide a comprehensive overview of sound HCWM practices in local HCFs, especially in developing countries. The publication covers the following topics: various types of waste produced from HCFs, their typical characteristics and the hazards these wastes pose to patients, staff and the general environment; guiding regulatory principles for developing local or national approaches to tackling HCWM and transposing these into practical plans for regions and individual HCFs; specific methods and technologies for waste minimization, segregation and treatment of HCW, including potential advantages and disadvantages of each system; difficulties of handling health care wastewaters, new guidance on the various sources of wastewater and wastewater treatment options for places not connected to central sewerage systems; economics, occupational safety, hygiene and infection control; staff training and public awareness; HCWM in emergencies; and an overview of the emerging issues of pandemics, drug-resistant pathogens, climate change and technological advances in medical techniques that will have to be accommodated by HCW systems in the future. Source: https://www.who.int/water_sanitation_health/publications/wastemanag/en/
UNITED NATIONS ENVIRONMENT PROGRAMME	'Compendium of Technologies for Treatment/Destruction of Healthcare Waste' (2012)	This compendium reviews data on HCW and recommends qualitative factors and estimation parameters pertaining to HCW, presents an overview of generic treatment technologies and provides detailed information on specific technologies. The focus of the compendium is on treatment and destruction technologies and not on other aspects of HCWM, but it also outlines a process of technology selection based on the United Nations Environment Programme's Sustainable Assessment of Technologies (SAT) methodology. Source: http://wedocs.unep.org/handle/20.500.11822/8628
UNITED NATIONS DEVELOPMENT PROGRAMME	'Healthcare Procurement and the Compliance with International Environmental Conventions on Chemicals' (2016)	This guide is aimed at assisting procurement practitioners to monitor compliance of health care procurement using the relevant international conventions for environmental safeguarding. Source: https://issuu.com/informal_int_task_team_sphs/docs/compliance_with_int_conventions_on_
UNITED NATIONS CHILDREN'S FUND	'UNICEF Implements Sustainable Procurement' (2018)	This publication by UNICEF outlines the organization's sustainable procurement framework and gives examples of economic, environmental and social considerations that constitute its procurement policy. Source: https://www.unicef.org/supply/files/Sustainable_Procurement_Information_Note.pdf

5. HEALTH CARE WASTE MANAGEMENT PRACTICES IN UKRAINE: EIGHT CASES

5.1. HEALTH CARE WASTE MANAGEMENT FLOW DIAGRAM AND RESULTS FROM THE SAMPLE ANALYSIS

Based on the visits to eight selected hospitals and clinics and interviews with their representatives, a typical HCWM flow diagram was drawn for all eight cases. While activities in all eight HCFs differ at each step of the flow diagram and are described in detail in Table 7, Figure 4 illustrates the overall sequence of steps taken by the HCFs in their HCWM practices.

FIGURE 4. TYPICAL HCWM FLOW DIAGRAM FOR EIGHT CASES



Source: CIVITTA (2019)

Table 7 provides a more detailed overview of the HCWM flow diagram for all eight cases. Given the limitations of the research, HCWM practices of HCFs that generate Category D waste are not represented in this table. Chapter 5.2 of the report provides an analysis of the degree to which Ukrainian HCWM practices conform to national legislation, while Annex 5 provides an overview of the international minimum standards for HCWM practices set by WHO[35] and the extent to which Ukrainian practices conform to them.

[35] World Health Organization, 'Safe management of wastes from health-care activities', Geneva, 2014, <https://www.who.int/water_sanitation_health/publications/wastemanag/en/>.

TABLE 7. OVERVIEW OF THE HCWM FLOW DIAGRAM

HCWM PROCESS	CATEGORY A 	CATEGORY B 	CATEGORY C 
GENERATION 	All hospitals and clinics interviewed generate this type of waste—glass, plastic, paper and other SMW (including food waste).	All the hospitals and clinics interviewed generate Category B waste, and its types vary based on the specialty of the hospital and the services it provides to its patients. The examples of Category B waste generated in the hospitals and clinics interviewed include: • Anatomical waste • Sharps • Laboratory waste • Disposable used medical waste (bandages, cotton etc.) • Medical plastic and glass waste (syringes, infusion systems, gloves, flasks)	All the hospitals and clinics interviewed have some sort of Category C waste – either light bulbs used for different purposes or mercury-containing thermometers (except for two children's clinics and a perinatal centre).
SEGREGATION, STORAGE (AND DISINFECTION) AT GENERATION POINT 	Only a city clinic and a public children clinic segregate some plastic waste, while others do not segregate Category A waste. This type of waste is collected in a separate bin with a plastic bag placed inside it.	While the quality and the look of these containers differ from hospital to hospital, all the HCFs interviewed have separate containers for different types of Category B waste with plastic bags placed inside them (at least a 'three-bin' sorting system is used). Except for one regional hospital that autoclaves all its medical waste, all the others disinfect (with liquid) their medical waste at generation points and discharge the disinfectant into the sewerage system afterwards. The waste is segregated and stored at generation points until the end of the shift; following disinfection it is transported to the temporary storage places.	Most of the hospitals and clinics interviewed do not have any specific instructions on how to collect, segregate and store Category C waste. Instead, in those hospitals and clinics where mercury-containing thermometers are still used, they have instructions on how to act when such a thermometer is broken. These instructions prohibit disposal of this waste in municipal waste bins and the sewerage system, but it is unclear whether hospitals and clinics that have them have contractors that dispose of this type of waste.
TEMPORARY STORAGE AT DEPARTMENT 	Apart from a public children's clinic that has temporary storage for recyclable plastic in a plastic bag at department level in a separate drawer, the other hospitals and clinics interviewed do not have such storage (they store segregated plastic with disinfected Category B waste instead).	A perinatal centre and a city clinic do not have temporary storage at the department level. The other hospitals and clinics interviewed have temporary storage places at department level where waste from all the generation points is carried and repacked into larger plastic bags or containers.	

HCWM PROCESS	CATEGORY A	CATEGORY B	CATEGORY C
TRANSPORTATION WITHIN HCF 	In all the hospitals and clinics where Category A waste is not segregated, it is carried in plastic bags from generation points to the municipal waste containers outside. In the case of a public children's clinic, recyclable plastic waste is repacked into larger packaging (plastic bags, cardboard boxes etc.) and transported by the clinic itself in a regular car to another building belonging to the clinic located in another part of the city.	For the hospitals and clinics that have waste storage places (either common or at department level) in the same building (two children's clinics, a perinatal centre and a military hospital), the packages with waste are usually carried by hand to these places. For those hospitals and clinics that have common storage places separate from the main hospital building (two regional hospitals and clinics and a city clinic), the waste is repacked into larger plastic bags (a regional hospital and a city clinic) or into special plastic bags for autoclaving (another regional hospital) and transported to the common storage places on trolleys that are not designed for the transportation of medical waste.	As far as light bulbs are concerned, the hospitals and clinics interviewed either participate in free of charge programmes organized by their local governments or non-governmental organizations to dispose of such waste (a city clinic and a military hospital) or do not have a contract with companies responsible for the disposal of light bulbs (except for one regional hospital and a public children's clinic).
COMMON STORAGE AT HCF 	Common storage for Category A waste comprises municipal containers located outside (with some special containers for plastic or glass).	A military hospital does not have common storage at the HCF, while the other hospitals and clinics interviewed have them. In the cases of two regional hospitals and a city clinic, their common storage rooms are in separate buildings (or shipping containers) where the waste is stored for a long time. In the cases of two children's clinics and a perinatal centre, their common storage rooms are in the same building (at department level or in a basement), where the waste is currently also stored for a long time. In the cases of hospitals that generate anatomical waste, they store it either in refrigerators in pathology and anatomy departments (two regional hospitals, a military hospital and a city oncology clinic) or in specially designated cool places without refrigerators (a city clinic).	
TREATMENT WITHIN HCF 	Category A waste is not treated within the HCF.	Except for two cases, the hospitals and clinics interviewed do not have any treatment of Category B waste within the HCF, and if they have autoclaves and/or microwaves, they are used to sterilize reusable medical instruments. The exceptions are a perinatal centre that has an on-site incinerator used to burn its anatomical waste—namely, post-abortion material—and a regional hospital that has specially assigned autoclaves to pretreat its medical waste.	

HCWM PROCESS	CATEGORY A	CATEGORY B	CATEGORY C
TRANSPORTATION OUTSIDE HCF	In all the cases, Category A waste is collected daily, apart from a private children's clinic where it is sometimes collected every two days. In the case of a public children's clinic that segregates some recyclable plastic waste, this waste is collected on demand. None of the representatives of the hospitals and clinics interviewed knew whether their Category A waste is transported by their contracted companies or a third party.	The time for the collection of Category B waste varies across hospitals and clinics: • **DISINFECTED RECYCLABLE MEDICAL WASTE:** In the cases of hospitals and clinics (a perinatal centre, a regional hospital, a city clinic, a public children's clinic and a military hospital) that recycle some of their disinfected medical waste—either plastic or glass—such waste is collected on demand, except for a military hospital where such waste is collected monthly. • **DISINFECTED NON-RECYCLABLE MEDICAL WASTE:** In all the cases, disinfected (liquid or autoclaved in the case of one regional hospital) medical waste that cannot be recycled is collected on demand, monthly, quarterly or twice a year. • **ANATOMICAL WASTE:** In the cases of hospitals and clinics that generate anatomical waste, such waste is collected either twice a week on 'surgery days' (a city clinic), on demand (a regional hospital), weekly (another regional hospital) or quarterly (a military hospital). None of the representatives of the hospitals and clinics interviewed knew whether their Category B waste is transported by their contracted companies or a third party.	
FINAL TREATMENT	In all cases, Category A waste is taken to landfill, while recyclable plastic waste from a public children's clinic and a city clinic is recycled. In the case of a city clinic, all or part of general Category A waste might be incinerated.	• **DISINFECTED RECYCLABLE MEDICAL WASTE:** In the cases of hospitals and clinics (a perinatal centre, a regional hospital, a city clinic, a public children's clinic and a military hospital) that recycle some of their disinfected medical waste—either plastic or glass—such waste is recycled by their contracted companies. • **DISINFECTED NON-RECYCLABLE MEDICAL WASTE:** In all the cases, disinfected (liquid or autoclaved in the case of one regional hospital) medical waste that cannot be recycled is incinerated (this information is unknown for a military hospital and the oncology centre). • **ANATOMIC WASTE:** In the cases of hospitals and clinics that generate anatomical waste, it is either incinerated (by companies contracted through ProZorro for a city clinic, a regional hospital and a military hospital, or in a perinatal centre's own incinerator used for the purpose of this hospital only) or buried (another regional hospital).	

5.2. SOCIAL, ECONOMIC AND ENVIRONMENTAL IMPACT ASSESSMENT

5.2.1. SOCIAL ASSESSMENT

In terms of social considerations, gender, social inclusion, labour rights and workplace safety, and health risks for the community in the area surrounding HCFs were evaluated.

GENDER

The evaluation is based on the following research questions:

- How diverse are genders in the HCF (overall staff, management and budgeting, tender committee, HCWM)?
- Do staff face any type of discrimination related to their gender?

The hospitals and clinics interviewed do not have any records on the distribution of genders of their staff, given there is no legal requirement. Most of the numbers received by researchers were estimates provided by the hospital representatives interviewed. Cases of discrimination based on sexual orientation or gender are not recorded either.

Overall, the distribution of genders varies across hospitals and clinics and is driven either by the type of work that needs to be performed or by the specialty of the hospital, as described by interviewees in the HCFs. Representatives of some of the HCFs mentioned that women are mostly involved in HCWM because they are either employed as medical or sanitary nurses, thus inevitably deal with the sorting, disinfection and collection of HCWM at generation points, or because "they are more responsible in administrative matters". Management positions at these eight hospitals and clinics, especially as far as budgeting and procurement processes are concerned, are occupied by men, with some exceptions: a deputy head doctor for medical issues at a city clinic and a deputy head doctor for economic issues at a regional hospital are women.

As far as the type of work that needs to be performed is concerned, in the case of almost all the hospitals and clinics interviewed, the nursing staff are usually women, which is why they are the ones dealing with HCW at generation points and at department level. In some of the HCFs, the overall distribution of staff is tilted towards women "given the specialty of the work they do"—in the case of a perinatal centre and two children's clinics—both private and public. In two other HCFs—a city clinic and a regional hospital—most administrative staff are women because they are considered to be "more responsible in administrative matters". In terms of medical staff, there are cases of the equal representation of men and women among surgeons and doctors—at a regional hospital and a military hospital—and there are two HCFs—another regional hospital and a city clinic—where men dominate the gender distribution of medical personnel.

While women are represented in procurement, budgeting and overall management positions, in most cases they are not the key decision-makers, and any decision they make must be further approved by the head doctors, who are, in all eight cases, men.

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- Men dominate in decision-making positions in hospitals and clinics—be it in procurement, budgeting or overall management matters.
- Most medical and sanitary nursing staff are women.
- Women are more likely to be employed in some hospitals and clinics than in others due to the specialty of the hospital.
- Women are believed to be "more responsible in administrative matters".

SOCIAL INCLUSION

The evaluation is based on the following research questions:

- Are there any extra bonuses for staff with special needs/women and men with special status (i.e. single or young mothers/fathers etc.)?
- Are the hospital premises accessible to persons with disabilities (access to the building and specific floors, bathrooms etc.)?

Regarding extra bonuses for staff with special needs or status, none of the hospitals and clinics interviewed have any records on the number of employees with such status in their HCF and pointed out that even if there were such bonuses, they were not managed by the hospital, but rather by state authorities responsible for social assistance. Further research confirmed that, indeed, social assistance is governed by the Law of Ukraine 'On State Social Assistance to Persons not Entitled for Pension and for Persons with Disabilities' (2004)[36] and the Decision of the Cabinet of Ministers of Ukraine 'On Approval of Procedures for Assignment and Disbursement of State Social Assistance to Persons not Entitled for Pension and for Persons with Disabilities' (2005).[37] According to these legislative acts and by-laws, the assignment and disbursement of social assistance are performed by social security agencies at different municipal administrative levels.

As far as the accessibility of HCFs to persons with disabilities is concerned, all the hospitals and clinics interviewed have ramps and elevators to accommodate persons with disabilities; however, in most cases, their toilets are not accessible. In a perinatal centre, some obstetrics and gynaecology rooms are equipped for persons with disabilities, and one regional hospital is planning to have a new reception unit that will be fully accessible. In the case of a military hospital, there is one department with a toilet equipped for persons with disabilities, with the development of the department sponsored by the United Nations Office for Project Services. The only exception among all the hospitals and clinics interviewed in terms of accessibility is a private children's clinic that has ramps, elevators, and a toilet accessible to people with special needs. That said, representatives of almost all the HCFs interviewed mentioned: "We would like to make our facilities accessible, if we had a budget for it." It is worth mentioning that HCFs are not the only ones to blame: as mentioned earlier in the report, the enforcement of such standards is undefined.

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- Hospitals and clinics do not have any records on employees with special needs/status.
- Any extra bonuses paid to employees with special needs/status are not administered by hospitals and clinics, but rather by state authorities responsible for this function.
- Most of the hospitals and clinics interviewed are only partially accessible to persons with disabilities (ramps and elevators).
- Most of the hospitals and clinics interviewed expressed the desire to make their facilities accessible, provided they were given the financial resources to do so.

LABOUR RIGHTS AND WORKPLACE SAFETY

The evaluation is based on the following research questions:

- What are the salaries of employees engaged in HCWM in a hospital? Do they have health insurance?
- Do hospitals and clinics have any special requirements or procedures for proper

[36] Verkhovna Rada of Ukraine, Law of Ukraine 'On State Social Assistance to Persons not Entitled for Pension and for Persons with Disabilities', Kyiv, 2004, <https://zakon.rada.gov.ua/laws/show/1727-15/ed20180831>.
[37] Cabinet of Ministers of Ukraine, Decision 'On Approval of Procedures for Assignment and Disbursement of State Social Assistance to Persons not Entitled for Pension and for Persons with Disabilities', Kyiv, 2005, <https://www.kmu.gov.ua/npas/15034385>.

vaccination of personnel working with HCW, especially with hazardous waste?

- Do employees in HCWM in a hospital undergo safety training?
- Is the personal protection sufficient to ensure the safety and health of those involved in HCWM in a hospital?

SALARIES AND BONUSES | As far as salaries for employees working in HCWM are concerned, the practices vary across the HCFs. In the case of five public hospitals and clinics, their salary depends on the so-called 'salary scale' that is calculated based on their position and experience. A private children's clinic and a military hospital did not disclose the exact salary. In the case of six hospitals and clinics, ranging from regional to city hospitals and clinics, a private one and public ones, the staff working with disinfectants are paid an additional 10 per cent of their salary. In the case of one regional hospital, the staff working in HCWM are paid an additional 50 per cent of their salary for 'hard work'. Both cases are within Ukraine's Labour Code. One public children's clinic also provides juice for the employees who work with disinfectants. A perinatal centre offers no additional payment for working with disinfectants.

HEALTH INSURANCE | Given that health insurance in Ukraine is not mandatory in many cases, whether hospitals and clinics insure their employees and the nature of the insurance also varies according to the specialty of the hospital and its ownership type. Two regional hospitals and a perinatal centre do not insure their staff. One public city clinic insures its employees against HIV and hepatitis, while a public children's clinic insures all its employees working with blood. A private children's clinic pays for the insurance of its staff against HIV. Apart from these, all the hospitals and clinics interviewed follow the MOH Procedure 'On Post-Exposure Prophylaxis (PEP) of HIV Infection for Employees during the Exercise of their Duties' (2013)[38] by providing their employees with free PEP once an accident occurs and is registered at the workplace.

VACCINATION | All employees working in health care institutions across Ukraine are required to have all the planned vaccinations to be hired, but some HCFs also either sponsor or organize certain vaccinations for their staff. Almost all the hospitals and clinics interviewed, except for one city clinic and one regional hospital, vaccinate their staff against hepatitis B. A city clinic and a regional hospital vaccinate their staff against tetanus. Some HCFs, including a city clinic and a public children's clinic, organize influenza vaccinations for their personnel. In most cases, the HCFs do not sponsor any vaccinations but require their medical personnel to be vaccinated against, for example, measles, mumps and rubella (MMR), diphtheria and tetanus before they are hired. If employees do not have these vaccinations, they are not allowed to work in a hospital.

TRAINING ON HCWM | According to the Decision of the Ministry of Health of Ukraine 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management' (2015) mentioned earlier in the report, medical personnel working with HCW must undergo onboarding training and yearly training on safe HCWM. All of the hospitals and clinics interviewed organize onboarding training when a new person is hired, and all of them follow the requirement for having regular training on HCWM, usually held by a department head nurse/midwife, at least once a year. Some of the HCFs have such training more often: twice a year in the cases of a city clinic, a public children's clinic and a regional hospital; once every quarter in the cases of a private children's clinic, a perinatal centre and a regional hospital. One regional hospital even organizes monthly training for the employees of its sterilization department.

PERSONAL PROTECTIVE EQUIPMENT | When working with HCW, according to the above-mentioned Decision of the MOH, medical personnel are required to have personal protective equipment that will ensure their safety and eliminate any potential health risks to which they might be exposed. Representatives of all the HCFs interviewed mentioned that their employees have access to personal protective equipment, including gloves (all eight of the HCFs), aprons and masks

[38] Ministry of Health, Procedure 'On Post-Exposure Prophylaxis (PEP) of HIV Infection for Employees during the Exercise of their Duties', Kyiv, 2013, <https://zakon.rada.gov.ua/laws/show/z1980-13>.

(seven of the eight), plastic gowns (three of the eight), glasses (two of the eight) and respirators (one of the eight HCFs). The quantity and quality of personal protective equipment depends heavily on the HCF's budget and, thus, its ability to procure enough of them, the level of humanitarian aid and donations it receives—in the case of one regional hospital and a perinatal centre—and the willingness of the management to invest in personal protective equipment for their employees. On this point, a representative of one private children's clinic mentioned, "One can save money on anything but the health and well-being of staff."

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- The salary of the staff working with HCW depends on a 'salary scale', and extra bonuses for working with disinfectants (10 per cent of the salary) are paid in most of the HCFs.
- With health insurance not being mandatory in Ukraine, individual hospitals decide whether to provide any and how extensive it is.
- All hospitals and clinics require potential employees to have received all planned vaccinations to be allowed to work, and some sponsor vaccination of their staff, but the conditions in which they are offered and the types of vaccinations vary.
- All hospitals and clinics organize training on safe HCWM in accordance with Ukrainian legislation (during onboarding and annually),[39] with some hospitals and clinics outperforming others in the frequency of such training.
- All hospitals and clinics offer personal protective equipment for employees dealing with HCW, but its type, quantity and quality varies and depends on the hospital's budget, additional financial aid and the willingness of hospital management to invest in it.

HEALTH RISKS FOR THE COMMUNITY IN SURROUNDING AREAS

The evaluation is based on the following research questions:

- What are the measures in place to ensure that HCW is not negatively influencing the local community?
- Does the community have access to information about how HCW is finally treated or disposed of?
- What is the level of awareness among HCF personnel about the potential health risks of inadequate disposal of HCW?

Regarding the measures in place to ensure that a hospital's HCWM practices are not negatively influencing the community residing in the surrounding areas, all the interviewees in all eight HCFs mentioned that the only measure they take is to ensure that the companies they contract to perform final (off-site) HCW treatment have the required hazardous waste management licences from the MOEEP.

When asked whether the community has access to information on how a hospital treats and disposes of its HCW, all the hospital representatives answered that because such information is not required by law, they have no mechanisms in place to provide it.

As far as the third research question is concerned, all the hospital representatives interviewed are very much aware of the potential health risks related to inadequate disposal of HCW, and some of them—specifically, representatives of two children's clinics (one private and one public) and two regional public hospitals—are invested in ensuring that they are following all the HCWM legal requirements. That said, given budget limitations in some cases and a lack of information and educational resources in others, these hospitals and clinics have still not implemented all the ideas

[39] Ministry of Health of Ukraine, Decision 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management', Kyiv, 2015, <https://zakon.rada.gov.ua/laws/show/z0959-15>.

they have when it comes to safe HCWM.

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- The only measure the HCFs have in place to ensure that their HCWM practices are not negatively influencing the community residing in the surrounding areas is to ask their contractors to provide a hazardous waste management licence from the MOEEP as required by Ukrainian legislation.
- Given that it is not a legal requirement, HCFs do not inform the residents of the surrounding areas of the ways they treat and dispose of their HCW.
- Most of the hospital representatives interviewed are aware of the health risks associated with inadequate disposal of HCW and follow the legal requirements, but they could do more if they were provided with better financial and intellectual resources on how to improve their current practices.

5.2.2. ECONOMIC ASSESSMENT

In terms of economic considerations, HCWM system finance and procurement practices were evaluated.

SYSTEM FINANCE

The evaluation is based on the following research questions:

- Does the current budget properly cover HCWM costs?
- Is there a trade-off in how resources are allocated (i.e. is HCWM financed as a residual)?
- What are the key gaps in financing the HCWM system?
- How transparent is the system of allocating a budget for waste management?

HCWM BUDGET | All the public hospitals and clinics interviewed, apart from the military hospital, are financed through either government (state and regional) or municipal (city) budgets. HCWM is financed from the 'services' budget line, which also includes utilities, repairs and other services. Usually, this budget line does not cover all the costs related to HCWM, and some HCFs have to ask for charity money (in the case of a regional hospital) to cover the costs or wait for a long time for the HCW to be transported for final off-site treatment (almost all the HCFs interviewed). In the case of the military hospital, HCWM is financed from a special fund comprised of fees received for medical services from non-military patients. A private children's clinic did not mention any problems with covering its HCWM costs. When representatives of the eight HCFs were asked how much extra money was needed to fully cover the costs of HCWM, most of them did not know an exact or even an approximate figure, nor were they sure about their total HCWM costs.

TRADE-OFF IN RESOURCE ALLOCATION | In most of the HCFs interviewed, HCWM is financed as a residual, and there is a trade-off in how resources are allocated. Representatives of three HCFs—a city clinic and two regional hospitals—mentioned that the HCF prefers to spend money on essential medicines and other health care commodities rather than on proper HCWM. The representatives of a private children's clinic assured the researchers that they want to and can allocate money for both the provision of health care services and waste management. A head doctor of a perinatal centre mentioned that there should be no trade-off in resource allocation if the head doctor is professional, educated and committed to finding the money for all the services their health care institution needs.

KEY GAPS IN FINANCING THE HCWM SYSTEM AT HOSPITAL LEVEL | When asked about the key gaps in financing the HCWM system in a hospital, most of the HCF representatives interviewed (five out of eight) expressed the wish to have a separate line of financing for HCWM. Its absence was also

mentioned as one of the key problems during the focus group discussion. Two of the HCFs—a city clinic and a regional hospital—also pointed out that in line with a recent reform in health care it is not clear to them how HCFs will be financed further, given the principle of 'money follows the patient' that states that only services provided to patients will be covered by the National Health Service of Ukraine, but not the services connected with the repair and maintenance of a hospital. For them, it is not clear whether there will be any HCWM costs included in this line of financing. The summary of other key gaps in financing the HCWM system, as identified by the HCF representatives interviewed, are summarized in Annex 6.

Given the lack of information provided by the interviewees, it is difficult to assess how transparent the system of budget allocation is in their HCFs.

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- The HCFs interviewed do not have a separate line of financing for HCWM, and, in most cases, their budgets cannot fully cover all HCWM costs.
- There is a trade-off in how resources are allocated, and, in most cases, HCWM is financed as a residual, except for a private children's clinic and a perinatal centre that has a very committed head doctor.

PROCUREMENT PRACTICES

The evaluation is based on the following research questions:

- What is the role of a hospital's staff when preparing procurement documents for medical commodities and services? Do hospitals have any procurement procedures to minimize their environmental impact?
- What is the hospital's stock management policy to reduce the quantity of expired or unused drugs?
- What are the reasons to choose one waste treatment company over the other?

PROCUREMENT OF MEDICINE AND MEDICAL COMMODITIES | Five of the eight hospitals and clinics interviewed use ProZorro for the procurement of medicines and medical commodities, as well as for procuring HCWM services. The HCFs that do not use the platform are two children's clinics—one private and one public—given their small procurement contracts, and a military hospital, which receives medicines and medical commodities through the centralized system. Most of the hospitals and clinics visited, apart from two children's clinics (one public and one private) and a perinatal centre, do not have any procurement policy aimed at reducing the environmental and health risks of their HCW. A perinatal centre and the two children's clinics moved to procuring electronic thermometers instead of mercury-containing ones, and the children's clinics are now procuring safe puncture systems.

Regarding the role of staff in the procurement process, in all the hospitals and clinics interviewed nurses and doctors take part in writing the technical specifications for specific medicines and medical commodities they need in their work, and these suggestions are compiled by the head nurse to be given to either a chief economist or an accountant, depending on the positions in the HCFs. Chief economists and accountants are then responsible for estimating the budget and publishing procurement requests on ProZorro after approval by head doctors.

STOCK MANAGEMENT POLICY | When asked about a stock management policy to reduce the quantity of expired or unused drugs, the HCF representatives responded that they either do not have such a policy because they are always short of drugs and supplies—hence do not have any expired drugs at all—or that they have a 'first in first out' policy. If the perinatal hospital received humanitarian aid, it reallocated those resources to other health care institutions throughout the city. A private children's clinic does not have any stock management issues, given that, as a private hospital, it usually buys what it needs when it needs it; thus, the drugs do not expire. If a drug is

quarantined by the State Medicine Service of Ukraine or has expired, the HCF is responsible for the treatment and disposal of the drug, and only in the case of a city clinic interviewed does the supplier take it back. This practice is in line with the existing legislation: the Order of the Ministry of Health 'On Approval of the Procedure of Banning (Temporary Banning) and Renewal of Circulation of Pharmaceuticals' (2011)[40] states that if a ban on using a specific drug is final, the HCF is responsible for its treatment or disposal or return to the supplier.

PROCUREMENT OF WASTE MANAGEMENT SERVICES | All the hospitals and clinics interviewed choose to contract companies to treat and dispose of their waste, including HCW, or some of its waste in the case of a perinatal centre that has an incinerator on site. In many cases, the choice of HCWM companies is limited and depends on the region in which the hospital operates—for example, there is no crematorium in Odesa or Mariupol, but there is one in Kyiv, and the HCFs interviewed in Kyiv use its services. When asked about the criteria on which HCFs base their choice of a contractor, all of them mentioned that cost is one of the main criteria—especially for those using the ProZorro system—with the other key criteria being the frequency of waste removal (which is important for five of the eight HCTs) and whether the company has a hazardous waste management licence from the MOEEP (considered critical by seven of the eight HCFs). Some other criteria include the contractor providing segregation containers or special packaging for HCW collection, as well as instructions on how to sort and collect this type of waste. As waste generators, all HCFs, according to the Law of Ukraine 'On Waste' (Article 35-1)[41] and the Law 'On Municipal Services' (Article 25),[42] must contract a local waste management company as the main waste management company for household waste. They conclude the agreement and pay for the services that this company provides: collection and transportation services, landfilling (or incineration) services for household waste and recyclable waste.

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- Only some of the HCFs interviewed have procurement procedures to minimize the environmental impact of the medicines and medical commodities they procure.
- Hospital staff at different levels are involved in the procurement process by either developing the specifications of the medicines and medical commodities to be procured or estimating the cost of procurement requests.
- The HCFs interviewed have either no stock management policy or have a 'first in first out' policy. These policies—or their absence—are driven by the fact that the HCFs either have shortages of essential drugs or have a way to reallocate excess stocks.
- If the drugs are expired or quarantined by the State Medicine Service of Ukraine, HCFs are responsible for their disposal, with one exception of a hospital that gives the quarantined drug back to the supplier.
- Most of the HCFs interviewed stated that the cost of HCWM services, the frequency of waste removal and whether their contracted company has a hazardous waste management licence from the MOEEP are the main criteria considered when choosing the contractor for HCW disposal.

5.2.3. ENVIRONMENTAL ASSESSMENT

[40] Ministry of Health, Order 'On Approval of the Procedure of Banning (Temporary Banning) and Renewal of Circulation of Pharmaceuticals', Kyiv, 2011, <https://zakon.rada.gov.ua/laws/show/z0126-12>.
[41] Verkhovna Rada of Ukraine, Law of Ukraine 'On Waste', Kyiv, 1998, <https://zakon.rada.gov.ua/laws/show/187/98-%D0%B2%D1%80>.
[42] Verkhovna Rada of Ukraine, Law of Ukraine 'On Municipal Services', Kyiv, 2018, <http://search.ligazakon.ua/l_doc2.nsf/link1/T172189.html>.

Regarding environmental considerations, policy and regulations, as well as environmental risks were evaluated.

POLICY AND REGULATIONS

The evaluation is based on the following research questions:

- Do the HCWM practices of HCFs conform to national legislation?
- What are the key legislative gaps that need to be bridged in the Ukrainian HCWM system?
- What are the main systemic issues for the centralization/decentralization of the Ukrainian HCWM system?
- Are any environmental aspects considered in decision-making processes (e.g. procurement processes) at a hospital level?

CONFORMANCE WITH LEGISLATION | Five of the HCFs interviewed—a city clinic, both regional hospitals, a perinatal centre and a private children's clinic—have approved waste management schemes required by law, but most of them are copied from the legislation and are not adapted to the local conditions in which the HCFs operate. Two of the HCFs interviewed—a public children's clinic and a military hospital—are currently preparing their schemes. All the HCFs interviewed have appointed at least two people responsible for waste management; usually there is a person responsible for Category A and Category B waste. In three of the HCFs interviewed (a private children's clinic, a military hospital and a city oncology centre), there are separate people responsible for Category C and Category D waste, while in the rest of the cases it is the same person responsible for Category A or Category B waste.

All the HCFs interviewed have at least a 'three-bin' sorting system—for general waste (SMW), infectious HCW and used sharps—at generation points. However, most of them are sorting more waste types: some types of medical plastic waste (e.g. syringes, tubes/hoses, closures etc.), medical glass waste (e.g. bottles from drugs), used gloves, anatomical waste (also biological liquids), disposable used HCW (e.g. bandages, cotton), laboratory waste, thermometers, light bulbs and SMW. The sorting system varies from hospital to hospital given the uncertainty of the legal requirement; thus, sorting mostly depends on the on-site pretreatment technology. If autoclaving is used—only in one regional hospital—all Category B waste types are collected into one stream, excluding sharps that are collected separately, but if liquid disinfection is used, there are more waste steams sorted for easier disinfection (the other six HCFs), and in some cases, plastic and glass waste are sorted for recycling (five HCFs). All the HCFs interviewed face a lack of waste segregation containers, even for sharps, which are currently being repacked to reuse the segregation container.

All the hospitals and clinics interviewed comply with the legislation when it comes to labelling the segregation containers at generation points, except for a city clinic whose representatives trust the 'institutional memory'. However, following the collection and repacking of disinfected waste into larger packages, apart from two children's clinics, the HCFs interviewed do not have labelling for special bags and containers for temporary on-site storage and transportation for off-site treatment.

All the HCFs interviewed have on-site storage facilities for temporary storage of waste—designated rooms, spaces in the basement or separate buildings (or shipping containers)—with access to them limited to people in charge of waste management. However, in all the cases (when the storage facilities were shown to the researchers) with the exception of one regional hospital, these storage facilities are of insufficient size (as waste accumulates for a long time) or do not have the necessary technical specifications (temperature or ventilation).

All the HCFs interviewed comply with the legislative requirement to decontaminate Category B waste (see the sections 'Waste hierarchy' and 'Environmental risk management' below), and only after disinfection is the waste stored and transported for final (off-site) treatment. However, in almost all the HCFs, the accounting and reporting of waste generated is missing (see the section 'Waste generation rate' below).

Conformance with the legal requirement on training is described in the section 'Training on HCWM' below.

KEY LEGISLATIVE GAPS | The following key legislative gaps were identified during the site visits to the selected hospitals and clinics:

- No clarity on how the budget is distributed externally (among HCFs) and internally (within internal budget lines)
- No legal requirements for HCFs to dedicate a separate line of financing for waste management (or for personal protective equipment)
- No clarification on how to apply the legal requirements of HCWM at hospital level, and inconsistency between the legal requirements of different authorities (regulations from the MOEEP vs. the MOH)
- No clear definition of waste (categories) and waste management operations
- No appropriate control and monitoring systems among responsible authorities to assess how legal requirements are being implemented at the hospital level, and an inadequate system of fines
- No legislative documents specifically tailored to develop HCWM policy and its infrastructure at national, regional and local levels
- A lack of clarity in the sharing of responsibilities regarding final waste treatment (hospital vs. waste treatment company).

SYSTEMIC ISSUES CONCERNING CENTRALIZATION/DECENTRALIZATION OF THE HCWM SYSTEM| In all eight HCFs, the decision on how to proceed with waste management (at a local, national or regional level) depends on the HCF's budget and the quantity of waste generated. The final decision is made by the senior management of all HCFs, in compliance with the national legislation and according to procurement procedures. However, some HCF representatives interviewed mentioned specific limiting factors concerning the choice of waste treatment technology, including:

- the lack of premises for on-site treatment (mentioned by a city clinic, a regional hospital and a public children's clinic);
- the availability of treatment companies in the region (mentioned by a city clinic, a public children's clinic and both regional hospitals and clinics); and
- a small amount of waste (one regional hospital and both children's clinics).

This also explains why the predominant decontamination method applied in almost all the HCFs interviewed (except for one regional hospital, which autoclaves its waste, and a perinatal centre, which has an incinerator for some of its anatomical waste) is liquid disinfection. Furthermore, only a few of the HCFs interviewed have special refrigerators for waste storage, and such a refrigerator is only used for temporary storage of anatomical waste (by both regional hospitals, a military hospital and a city oncology clinic).

ENVIRONMENTAL ASPECTS | Most of the HCFs visited, apart from the two children's clinics (one public and one private) and a perinatal centre, do not have any procurement policy aimed at reducing environmental and health risks, any sustainability criteria or other procedures to reduce their impact on the environment.

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- Most of the HCFs interviewed have approved waste management schemes, but they are formal and not adapted to the local conditions in which the HCFs operate.
- All the HCFs interviewed have appointed people responsible for waste management (mostly for two streams: for Category B waste and for all the other waste).
- All the HCFs have at least a 'three-bin' sorting system at generation points, but the

segregation system depends on the on-site waste pretreatment technology.

- All the HCFs interviewed face a lack of waste segregation containers.
- Most of the HCFs only have labelling of segregation containers at generation points, but not following the collection and repackaging of the disinfected waste for temporary on-site storage and transportation for off-site treatment.
- While all the HCFs interviewed have designated waste storage facilities, in most cases they are of insufficient size or do not have the necessary technical specifications (temperature or ventilation).
- All the HCFs interviewed comply with the legislative requirement to decontaminate Category B waste, and only after disinfection is the waste stored and transported for final (off-site) treatment.
- Key legislative gaps include a lack of clarity in the distribution of budgets and the lack of a designated line of financing for HCWM at hospital level, a lack of clarity and inconsistency in the description of legal requirements, a lack of clarity in the definition of waste (categories) and waste management operations, an insufficient control and monitoring system for HCWM, an inadequate system of fines, poor HCWM policy and infrastructure, and a lack of clarity in the sharing of responsibilities for final HCWM treatment.
- Key limiting systematic issues concerning centralization/decentralization of the HCWM system include a lack of premises for on-site treatment, a limited number of treatment companies in the region, small amounts of waste generated, and a lack of existing on-site treatment/storage installation (autoclaves, microwaves, refrigerators etc.).
- Most of the HCFs visited do not have any procurement procedures aimed at reducing their negative impact on the environment.

ENVIRONMENTAL RISKS

The evaluation is based on the following research questions:

- What stage is HCWM (by different types of HCW) in Ukraine at in terms of waste hierarchy?
- What stage is the environmental risk management of Ukrainian HCWM at (by different types of HCW)?
- Does the waste generation rate conform to EU or international rates?

WASTE HIERARCHY | Although none of the HCFs interviewed has special procedures (including procurement procedures) for waste prevention (minimization), reuse or recycling, some of them are already performing certain actions in this sphere, including the use of special equipment for sterilization of reusable (multipurpose) medical devices (all the HCFs interviewed, except for one hospital that refused to disclose information), segregation of plastic and glass waste for recycling (plastic in five HCFs, and glass in two) (see Annex 7). Furthermore, all the HCFs have at least a 'three-bin' sorting system for general waste (SMW), infectious HCW and used sharps (to reduce the amount of Category B waste that requires special treatment).

As far as the criteria for the selection of the final waste treatment/disposal technology are concerned, during the procurement of off-site waste treatment services, none of the HCFs interviewed care about the technology as "it shouldn't bother the hospital at all". Nevertheless, not all waste from HCFs goes to landfill, and other technologies are also used (see Annex 7):

- recycling of plastic and glass waste (including SMW and disinfected category B waste) in five of the HCFs interviewed;

- incineration of SMW in one HCF, of disinfected Category B waste in six HCFs and of anatomical Category B waste in two of the HCFs interviewed; and
- landfilling of SMW in five HCFs and of anatomical Category B waste in one.

ENVIRONMENTAL RISK MANAGEMENT | All the hospitals and clinics interviewed comply with the requirement to decontaminate Category B waste before final treatment off site. Six of the eight HCFs interviewed are using chemical disinfection (liquid), one regional hospital is using a physical method (autoclaving), and a perinatal centre incinerates some of its anatomical waste. However, in all the HCFs interviewed the researchers noticed cases of possible environmental risks within and/or outside the HCFs, summarized below:

- Risk of improper disinfection: Too little disinfectant is used (not covering all the waste in a disinfection container); hermetic blood containers are only disinfected from the outside; the autoclaves and the incinerator are old (and often have maintenance issues that might result in uncontrolled emissions into the air)
- Risk of improper final treatment: Insufficient budget to contract licensed companies to treat Category B waste (unreliable accounting, as the amount of Category B waste depends on the allocation of money; unauthorized companies to treat HCW)
- Risk of improper personal protection: Inadequate budget for sufficient and appropriate personal protective and segregation equipment—'homemade' segregation containers (water bottles for needles or bigger plastic containers from chemicals); manual dismantling (cutting) of some types of HCW for recycling; repacking of sharps; cardboard boxes for collection/transportation of sharps
- Risk of improper qualifications (competence) of medical personnel involved in HCWM: Although internal training is performed in all the hospitals and clinics interviewed, the HCF representatives stressed that they lack instructions on proper HCW treatment procedures at hospital level from responsible authorities (in the form of training, recommendations, pilot projects etc.).

WASTE GENERATION RATE | None of the hospitals and clinics interviewed are monitoring the amount of waste generated at generation points. Five of the eight HCFs are performing waste accounting at department level (in bags in a city clinic, both regional hospitals and a military hospital; in units in a private children's clinic). General accounting of waste generated is done in all the HCFs interviewed according to the Acts of Services Provided and/or invoices for such services: according to the volume of containers and number of pick-ups for Category A; based on weight in six HCFs for Category B; and according to the number of units (e.g. light bulbs) for Category C. As the waste accounting data are very poor and depend heavily on the budget allocated, it is impossible to calculate any generation rates and compare them with EU or other international rates.

CONCLUSIONS ABOUT THE EIGHT HOSPITAL CASES

- Although there are no procedures for waste prevention (minimization), reuse or recycling in the hospitals and clinics interviewed, some of them perform certain actions, including the use of special equipment for the sterilization of reusable medical devices and the segregation of plastic and glass waste for recycling.
- None of the hospitals and clinics interviewed have criteria for the selection of final waste treatment/disposal technology.
- Most Category B waste is incinerated, while most Category A waste is landfilled.
- All the hospitals and clinics interviewed decontaminate their Category B waste using chemical disinfection (liquid), except for one hospital that autoclaves it and one hospital that incinerates some of its waste.

- The following risks have been identified when it comes to HCW risk management: improper disinfection, improper final treatment, improper personal protection and improper qualification of personnel involved in HCWM.
- As the waste accounting data are very poor and depend heavily on the budget allocated, it is impossible to calculate any generation rates and compare them with EU or other international rates.

6. THE CASE OF LITHUANIA

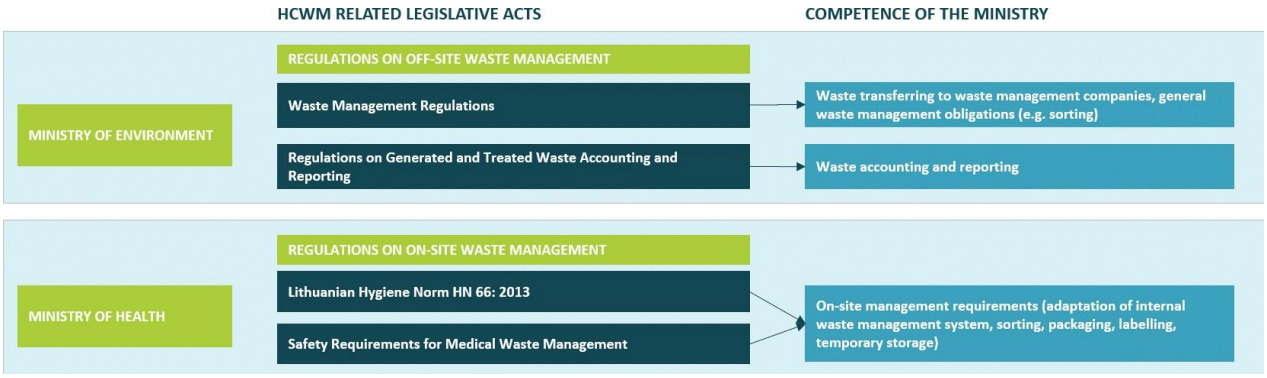
To understand how other countries moved towards the establishment of their HCWM systems (from the development of legislation to implementation of current HCWM practices), the case of Lithuania is summarized as an example, and the historic development of its HCWM system is described in Annex 8. Lithuania was chosen for several reasons, including the following:

- Similar to Ukraine, Lithuania is a former socialist country that had to build its HCWM system from scratch after the collapse of the Soviet Union.
- In 2004, Lithuania became a member of the EU and went through the process of adapting its legislation and practices in accordance with EU regulations. Given Ukraine's aspirations to join the EU in the future, the Lithuanian experience will be relevant, especially in the field of waste management and HCWM.

ADMINISTRATIVE STRUCTURE

The Law on Waste Management is the key legal act in the field of waste management in Lithuania. It describes general principles and the obligations and responsibilities of stakeholders, and determines basic requirements. Detailed requirements for waste management are described in orders of the Ministry of Environment (in most cases), and additionally in several requirements approved by other ministries or local municipal authorities. According to the Law on Waste Management, responsibilities for HCWM are shared between the Ministry of Environment and the Ministry of Health. The requirements for HCFs in the field of HCWM are described in three legislative acts and include requirements under the competency of both ministries.

FIGURE 5. MAIN LEGISLATIVE ACTS ADOPTED BY AUTHORITIES FOR HCWM IN LITHUANIA AND THEIR COMPETENCE



MINISTRY OF HEALTH | The Ministry of Health coordinates the HCWM activities of HCFs and initiates projects to create necessary HCWM capacities. Under its supervision is the National Public Health Centre (responsible for the supervision and inspection of HCFs, including the supervision of on-site waste management activities).

Requirements under the competence of the Ministry of Health cover on-site HCWM activities, including:

1) On-site sorting, packing, labelling and temporary storage:

- HCW at source should be collected in separate packaging according to the medical waste groups specified in the Annex to the Hygiene Norm.
- It is prohibited to sort collected medical waste, mix it with other waste produced in the HCF or compact it.
- Packaging should be impermeable to liquids and should not allow medical waste to spill,

disperse or otherwise enter the environment.

- Packaging should be disposable and discarded with its contents.
- Medical waste must be filled up to a maximum of three quarters of the package volume.
- Medical waste must be collected in packaging of a different colour from other HCW.
- Sharp items, irrespective of the type of waste, must be packed in sealed and puncture-resistant disposable non-glass containers.
- Anatomical waste must be packed in opaque packages.
- Packaging of hazardous medical waste must be labelled with the label of hazardous waste accordingly.
- Packaged medical waste must be removed from the place of its generation to the medical waste storage facility only in containers/packaging intended for the transportation of medical waste, which must be cleaned and disinfected in accordance with the HCWM procedure established by the HCF.
- Medical waste (other than sharp objects) must be removed from the place of its generation to the medical waste storage facility daily. If the medical packaging is filled up to three quarters of the volume before the end of the day, the packaging must be transported to the storage facility immediately without waiting until the end of the day.
- Upon expiry of its temporary storage time, packaged medical waste in the medical waste storage facility must be transferred, in accordance with the requirements of the Rules on Waste Management, to a waste management company under contract for final recovery or disposal.
- Infected waste pretreated on site in HCFs, except for biocidal treatment of contaminated waste, shall be considered non-hazardous waste.
- Infectious waste may only be recycled after treatment in medical waste decontamination facilities.

2) On-site pretreatment:

- Pretreatment of contaminated medical waste by HCFs must be carried out only by means of specialized (certified) medical waste treatment installations and equipment, the manufacturers of which must state the suitability for treatment of medical waste, in accordance with the manufacturer's instructions.
- Pretreatment of contaminated medical waste with biocides is prohibited if the waste will be transferred for off-site treatment.
- Biocides (powder or granules) may only be used for the pretreatment of liquid waste.
- Infected medical waste must be packaged in packaging authorized for use in an appropriate medical waste treatment facility.
- During the treatment of infected waste, it is mandatory to monitor the efficiency of the medical waste decontamination process and to record the results in accordance with the procedure established in the HCWM procedure.

MINISTRY OF ENVIRONMENT | The Ministry of Environment regulates and administers the management of all types of waste and polices the implementation of the requirements and tasks established. Under its supervision are the Environmental Protection Agency (responsible for permitting, licensing and registration of waste management facilities and companies, as well as waste accounting at the national level) and the Environmental Protection Department—formerly eight Regional Environmental Protection Departments (responsible for the supervision and inspection of waste holders and waste management companies).

Requirements under the competence of the Ministry of Environment are supervised by the

Environmental Protection Department and include:

1) Medical waste transferring to waste management companies:

- A contract with an HCWM company is required (contracts only for waste collection/transportation are not allowed).
- Medical waste should be transferred to a waste management company only if an electronic Waste Transfer Note is filled in (through the National Packaging, Goods and Waste Accounting System (GPAIS).
- Fines for infringement of the above-mentioned requirements are foreseen (Lithuanian fines for infringement range from EUR120–850 for administrative offences to EUR150–1,400 for legal entities).

2) Medical waste accounting and reporting:

- Obligations cover all HCFs with 10 or more personnel.
- Since January 2018, accounting and reporting should be done only electronically through GPAIS.
- Accounting obligations: the amount of medical waste generated must be measured at least once a month; if medical waste is delivered to a waste management company more often, it should be measured before being transferred.
- Quarterly reports and annual reports should be submitted via GPAIS.

MINISTRY OF ECONOMY AND INNOVATIONS | Formerly, the Ministry of Economy developed and approved programmes to promote waste prevention and encourage the reduction of industrial waste, the introduction of low-waste technologies and the creation of markets for products derived from secondary raw materials. It also coordinated the implementation of these programmes as well as the activities of industrial enterprises in implementing waste management practices in their production.

WASTE MANAGEMENT COMPANIES

Off-site waste management activities in Lithuania are approved (allowed) by a three-tiered system:

- Permitting: For all waste management facilities, depending on the types and the amount of waste treated, Integrated Pollution Prevention and Control (IPPC) Permits or Pollution Permits should be issued.
- Hazardous Waste Management Licensing: Since January 2019, this has been used only for hazardous waste transportation and collection activities; before then it was used for hazardous waste recovery, disposal and storage.
- Registration in the National Registry of Waste Management Companies (Atliekų tvarkytojų valstybės registeras—ATVR).

For information on hazardous waste management companies in Lithuania, see Annex 9.

For the recovery or disposal of hazardous and non-hazardous HCW, a permit and registration in the ATVR are required; for the transportation of hazardous HCW, a Hazardous Waste Management Licence and registration in the ATVR are required; and for the transportation of non-hazardous HCW, only registration in the ATVR is needed. Additionally, all hazardous waste management companies are required to have qualified staff.[43]

Collection and transportation of hazardous waste (including hazardous HCW) by road must be done in accordance with the conditions specified in Technical Annexes A and B (version of 1 January 2019) of the European Agreement on the International Carriage of Dangerous Goods by Road (ADR) and the Lithuanian requirements of the Law on the Transport of Dangerous Goods by Road, Rail

[43] Certificates for special training according to a Ministry of Environment-approved programme must be obtained.

and Inland Waterways, and its implementing legislation. However, this requirement is not checked by environmental authorities when issuing permits/licences or registering companies in the ATVR. Furthermore, there are no other additional legal requirements for waste transportation/collection companies (e.g. requirement for vehicles), and any company may obtain the right to collect and transport hazardous waste (including HCW); thus, even infected medical waste may be transported in any type of vehicle. To minimize risks related to transportation of hazardous HCW, the Rules on Waste Management (approved by the Ministry of Environment) were amended, with requirements for collection and transportation companies to deliver HCW from the waste holder (HCF) to a waste treatment company within 24 hours.

Disposal of hazardous medical waste in landfills is prohibited in Lithuania. Non-hazardous medical waste may be disposed of in landfills only after proper pretreatment.

According to data published by the Environmental Protection Agency, the generation of HCW has remained at the same level in Lithuania for the last six or seven years, at about 1,700–1,900 tons per year.

LESSONS LEARNED AND MISTAKES TO BE AVOIDED IN UKRAINE

- Only one medical waste treatment facility for a region (in Lithuania's case, for the whole country) is a high-risk solution because, in the case of termination of the facility's operation, there is no HCW treatment alternative. Additionally, the waste treatment monopoly creates conditions for unreasonably high prices (even if that monopoly is state-owned). Waste export is not a suitable solution, given that it depends heavily on the conditions in countries to which it is exported. It is recommended to foresee alternative treatment facilities (with necessary capacity) to treat medical waste in case of an emergency at the national or regional (oblast) level.
- National financing for the purchase of relatively small-scale HCWM installations (e.g. autoclaves (with or without shredders), refrigerators etc.) could solve the local problems of HCFs (e.g. longer duration of waste storage, reduction in the number of transfers) and could create alternative capacity alongside existing or future national and regional capacity. This will not create a national or regional-level HCWM system though.
- While the EU waste hierarchy lays down a priority order of the best overall environmental option in waste legislation and policy, there might be exceptions necessary for specific waste streams (e.g. HCW) based on technical feasibility, economic viability and environmental protection. As far as HCW is concerned, environmental safety and the avoidance of health risks are of a first priority, and in this case, incineration is a better solution than landfilling. However, recycling (even of non-hazardous HCW) should be evaluated carefully to ensure a safe waste management process from generation points at HCFs to final treatment.
- Requirements for on-site HCWM should be in line with existing and/or planned infrastructure for off-site HCWM infrastructure (e.g. if medical waste incineration infrastructure is planned, on-site pretreatment (chemical disinfection) should be prohibited).
- Obligations and responsibilities should be clearly shared between health care and environmental authorities (e.g. health care authorities could be responsible for the regulation and supervision of on-site HCWM, and environmental authorities for the regulation and supervision of off-site HCWM). At the same time, cooperation among health care and environmental authorities is needed to ensure the adequacy and effectiveness of requirements (e.g. avoiding double accounting requirements, misunderstandings of waste classification).
- Foreseeing of additional specific requirements for medical waste collection/transportation vehicles is recommended and should be performed when registering/licensing HCW

collection/transportation companies.

- The requirement for waste holders (including HCFs) to have contracts with waste treatment companies should be clearly defined, meaning that contracts for waste collection/transportation only should not be allowed. It should be clarified in which cases the original waste producer is to retain responsibility for the whole treatment chain or in which cases responsibility could be shared by the waste producer and the waste holder or delegated among the actors of the waste treatment chain at the national level.
- The requirements for waste accounting and reporting should be clearly defined and controlled by the responsible authorities. The development of unified waste transfer notes creates more opportunities for environmental supervision to track the whole waste path from waste producer (HCF) to final treatment facility.

7. CONCLUSIONS AND RECOMMENDATIONS

7.1. CONCLUSIONS

POLICY AND LEGISLATION

- Although the National Strategy for Waste Management in Ukraine until 2030 outlined the main directions of state regulation on waste management (including HCW) in line with key EU waste directives, the adoption of necessary laws and by-laws is behind schedule.
- Responsibilities[44] for HCWM are shared between several state authorities, and these responsibilities are not clearly defined and sometimes overlap.
- It is not clear which is the main authority responsible for the planning and development of the HCWM system (including infrastructure); thus, there is no integrated HCWM system at national, regional or local levels (only some fragments exist).
- While there is an official registry of licensed hazardous waste management companies,[45] it does not guarantee that all the companies listed are reliable and have the necessary technical capacities to treat HCW.
- The authorities do not have effective systems to monitor compliance with legal requirements at the hospital level, and the system of fines is inadequate.
- There is no clear definition of waste categories and waste management operations, and a lack of understanding or unclear legal requirements for reporting and accounting of waste generated, due to the inconsistency of the legal requirements set by different authorities (regulations from the MOEEP vs. the MOH).
- The sharing of responsibilities for final waste treatment (HCF vs. waste treatment company) is unclear.

FINANCING OF THE SYSTEM

- There is insufficient financing of the HCWM system, as hospitals and clinics do not have a separate line of financing, and in most cases, their budgets cannot fully cover all the HCWM costs, including waste treatment equipment and personal protective equipment.
- There is a lack of clarity on how the budget for HCWM is allocated both externally (among hospitals) and internally (within a hospital).
- There is a trade-off in how resources are allocated at the hospital level; in most cases, HCWM is financed as a residual.
- The declared amount of HCWM (Category B) generated depends heavily on the budget allocated (not all waste is declared as medical or hazardous).
- Hospitals and clinics use additional sources to obtain financing for HCWM, including charity funds created within and outside HCFs, and special funds generated by payments from patients for medical services.

PROCUREMENT PRACTICES

- The Law on Public Procurement makes the procurement process more transparent, but the

[44] Verkhovna Rada of Ukraine, Law of Ukraine 'On Waste', Kyiv, 1998, <https://zakon.rada.gov.ua/laws/show/187/98-%D0%B2%D1%80>; Verkhovna Rada of Ukraine, Law of Ukraine 'On Sanitary and Epidemiological Safety of Population', Kyiv, 1994, <https://zakon.rada.gov.ua/laws/anot/4004-12>.

[45] Ministry of Energy and Environmental Protection, 'Registry of Licensed Companies for Hazardous Waste Management', Kyiv, 2019, <https://menr.gov.ua/content/perelik-licenziativ-na-provadzhennya-gospodarskoi-diyalnosti-z-povodzhennya-z-nebezpechnimi-vidhodami.html>.

final decision is made by senior management, with hospital staff at different levels being involved in the development of technical specifications or estimating the cost of procurement requests.

- Although the application of the ProZorro online platform (or other authorized electronic platforms) makes the procurement process more organized, it still allows falsification and does not ensure the selection of companies that can provide ecologically safe treatment of medical waste.
- In general, there is no procurement policy for waste management services or medical commodities to minimize their environmental and health impact. Cost is the main criterion for selecting a waste treatment company, with frequency of waste removal and having a hazardous waste management licence from the MOEEP being other, less important criteria. The HCFs interviewed have either no stock management policy or have a 'first in first out' policy. These policies—or their absence—are driven by the fact that the HCFs either have shortages of essential drugs or have a way to reallocate excess stocks.
- It is unclear how hospitals and clinics should select a reliable waste treatment company.

HEALTH CARE WASTE MANAGEMENT PRACTICES (ON SITE)

- Although the legislation on HCWM was adopted in 2015, HCFs are not provided with clarifications (recommendations) from the authorities on how to proceed with these legal requirements at the hospital level.
- Most of the hospitals and clinics interviewed have approved waste management schemes, but they are formal and not adapted to the local conditions in which the HCFs operate.
- All the hospitals and clinics interviewed have appointed people responsible for waste management (mostly for two streams: Category B waste and all other waste). The level of competence of hospital staff is quite low, as there are no training or recommendations on how to apply State Sanitary Norms on HCWM and other regulations from the authorities.
- Very few hospitals and clinics perform proper waste accounting and reporting, as required by the regulations.
- Although there are no procedures for waste prevention (minimization), reuse or recycling in the hospitals and clinics interviewed, some of them perform certain activities, including the use of special equipment for sterilization of reusable medical devices and the segregation of plastic and glass waste for recycling. Besides, all hospitals and clinics have at least a 'three-bin' sorting system for general waste (SMW), infectious HCW and used sharps at generation points. The sorting system depends on the on-site waste pretreatment technology used (i.e. liquid disinfection, autoclaving, microwaves, incineration etc.).
- There is a lack of waste segregation containers, as well as special means for transportation of waste within a hospital (e.g. trolleys).
- Most of the hospitals and clinics interviewed only label segregation containers at generation points, but not following the collection and repackaging of the disinfected waste for temporary on-site storage and transportation for off-site treatment.
- All the hospitals and clinics interviewed follow the legislative requirement to decontaminate Category B waste, and only after disinfection is the waste stored and transported for final (off-site) treatment. The predominant decontamination method is chemical disinfection with liquids.
- Although there are storage facilities on site, in most cases they are of insufficient size (as waste accumulates for long periods) or do not have the necessary technical specifications (temperature or ventilation). There is also a lack of special cooling equipment (refrigerators) for storage of anatomic waste.

- Waste treatment installations (autoclaves, microwaves, incinerators etc.), where present, are old and often having maintenance issues that might result in uncontrolled emissions into the air.

HEALTH CARE WASTE MANAGEMENT PRACTICES (OFF SITE)

- Some regions lack reliable off-site HCW treatment facilities (infrastructure); thus, there are increased costs and risks of unsafe management outside the hospital.
- There is a lack of sorting and treatment infrastructure to ensure minimization, reuse and recycling of SMW.
- Most Category B waste is incinerated, while most Category A waste is landfilled.
- The transportation of medical waste outside HCFs is not properly regulated and monitored, as there are no clear requirements.
- The collection of medical waste for final off-site treatment is not performed when required, since it depends directly on the budget available or the small amount of waste generated.
- The oversight of waste management companies and their compliance with waste management regulations is weak.

SOCIAL CONSIDERATIONS

- Men dominate in decision-making positions in hospitals and clinics—be it for procurement, budgeting or overall management matters. More of the medical and sanitary nursing staff are women.
- Hospitals and clinics do not have records on employees with special needs/status. Any extra bonuses paid to employees with special needs/status are not administered by HCFs, but rather by state authorities responsible for this function.
- Most of the hospitals and clinics interviewed are only partially accessible to persons with disabilities (ramps and elevators) but have expressed the willingness to become accessible if they receive the necessary financial resources to do so.
- The salary of the medical staff working in HCWM depends on the 'salary scale', and extra bonuses for working with disinfectants (10 per cent of salary) are paid in most of the cases. With health insurance not being mandatory in Ukraine, individual HCFs decide whether to provide any and how extensive it is.
- All hospitals and clinics require potential employees to have all planned vaccinations to be allowed to work, and some sponsor vaccination of their staff, but the conditions in which they are offered and the types of vaccination vary.
- All hospitals and clinics organize training on safe HCWM in accordance with Ukrainian legislation (during onboarding and annually afterwards), with some HCFs outperforming others in the frequency of such training.
- All hospitals and clinics offer personal protective equipment for employees dealing with HCW, but its type, quantity and quality varies and depends on the hospital budget, any additional financial aid and the willingness of hospital management to invest in it.
- Given that it is not a legal requirement, HCFs do not inform the residents of the surrounding areas of the ways in which they treat and dispose of their medical waste.

7.2. RECOMMENDATIONS

Given Ukraine's path to EU association and the involvement of different stakeholders interested in the development of HCWM, it is the right time to develop a framework for the national HCWM system.

The framework can be developed by applying an internal and external expert-driven strategy

development process, where national authorities and the experts decide on the strategic development of the system, or by applying the latest transformative processes that can help existing HCWM stakeholders in Ukraine build the system by using a 'bottom up' approach. Through structured dialogue, all stakeholders can discover their common ground, decide on the future strategy and different scenarios and later draft concrete action plans. This new, participatory strategy development method relies on mutual learning among stakeholders as a catalyst for voluntary action and follow-up with strong commitment to the selected strategy.

Regardless of the method selected, it is recommended to analyse various scenarios for development of the national HCWM system, taking into account experiences and best practices of other countries.

7.2.1. RECOMMENDATIONS FOR NATIONAL LEGISLATION AND POLICIES

The main recommendations for changes to national policy and legislation include:

RECOMMENDATION 1 | Adoption of national legislation on waste management must be harmonized with key EU waste directives—according to the EU–Ukraine Association Agreement (2014)[46]—and other international environmental conventions, especially when it comes to the Law on Waste Management and subsequent by-laws.

RECOMMENDATION 2 | The sharing of obligations and responsibilities among the two main authorities—the MOEEP and the MOH—should be clearly defined, including regulation, control, planning and development of the HCWM system (including infrastructure). For example, health care authorities could be responsible for the regulation and supervision of on-site HCWM, and environmental authorities for the regulation and supervision of off-site HCWM. At the same time, cooperation among health care and environmental authorities is needed to ensure the adequacy and effectiveness of requirements (e.g. avoiding double accounting requirements, misunderstandings of waste classification).

RECOMMENDATION 3 | A key starting point for the development of an HCWM framework should be an inventory of existing HCWM capacities (state and private), as foreseen in the National Plan for Waste Management in Ukraine until 2030 (2019), and a feasibility study on the development of a national HCWM system with analysis of different alternatives ('baseline' scenario, decentralized system and centralized system scenarios).[47]

RECOMMENDATION 4 | HCWM regulations should be reviewed to solve the inconsistency of legal requirements set by different authorities and provide a clear understanding of the following aspects of the HCWM system:

- Definition of HCW and waste management operations
- Pharmaceutical waste management
- Application of a waste hierarchy, concerning waste minimization (prevention), reuse, recycling, recovery (incineration) and disposal (landfill)
- Provisions concerning on-site decontamination methods—moving from chemical disinfection (with liquids) towards physical methods (thermal, microwave, radiation

[46] Association Agreement between the European Union and its Member States, and Ukraine, 2014.

[47] In the baseline scenario, the system is developed from the top. The government is downplaying policy and legislation. The executives are waiting for concrete provisions, and legislation is constantly being updated to address emerging issues from hospitals, waste management companies, controlling authorities and other participants in the system. The system evolves chaotically. The State installs infrastructure or provides funding if money is available. Participants in the system are self-regulating based on the 'who is stronger' principle. Legislation and funding are influenced by those who have access to government or legislation. In a decentralized system, the common principles are set at national level, but regions are allowed to develop their systems according to their needs. In a centralized system, the system is developed from the top but has very clear rules.

etc.)—for large HCFs

- Waste accounting and reporting for HCFs and waste management companies
- Sharing of responsibilities between waste producers (HCFs) and waste management companies
- Requirements for transportation of medical waste
- Training of staff to apply legislative requirements.

RECOMMENDATION 5 | The requirement for waste holders (including HCFs) to have contracts with waste treatment companies should be clearly defined, meaning that contracts for waste collection/transportation only should not be allowed. It should be clarified in which cases the original waste producer is to retain responsibility for the whole treatment chain or in which cases responsibility could be shared by the waste producer and the waste holder or delegated among the actors in the waste treatment chain at the national level.

RECOMMENDATION 6 | Requirements for on-site HCWM should be in line with existing and/or planned infrastructure for off-site HCWM infrastructure (e.g. if medical waste incineration infrastructure is planned, on-site pretreatment (chemical disinfection) should be prohibited).

RECOMMENDATION 7 | The control, monitoring, accounting, reporting and permitting (licensing) systems should be strengthened by reinforcing appropriate legal requirements (including higher fines for infringement) and improving institutional capacity-building.

RECOMMENDATION 8 | Implementation of unified waste transfer notes should be evaluated to create more opportunities for environmental supervision to track the whole waste path from waste generation at an HCF to its final treatment.

RECOMMENDATION 9 | Financing of HCWM (as well as appropriate personal protection equipment) should be clearly defined in legislation, with HCFs responsible for allocating and monitoring essential financial resources as a separate line in the budget.

RECOMMENDATION 10 | A responsible authority should develop recommendations or guidelines for HCWM-based legal requirements and international practices (from the procurement policy for goods to waste management practices), to reduce environmental and health risks for all target groups involved: HCFs, waste management companies and authorities, as well as citizens who generate HCW (including pharmaceuticals) at their homes.

RECOMMENDATION 11 | A responsible authority should develop more tailored training for HCF staff on HCWM, including a recommendation on the application of national legal requirements.

RECOMMENDATION 12 | National and international donors should be involved in financing the development of the HCWM system (infrastructure, institutional capacity and public awareness) at local, regional and national levels and support all public financing for the SDGs. The development of small-scale HCWM installations (e.g. autoclaves (with or without shredders), refrigerators etc.) could solve the local problems of HCFs (e.g. longer duration of waste storage, reduction in the number of transfers) and could create alternative capacity. Therefore, the main HCW treatment infrastructure and alternative treatment facilities (with the capacity needed to treat HCW in case of an emergency at national or regional (oblast) level) need to be foreseen in the planning process. It is also important to consider that a waste treatment monopoly might create conditions for unreasonably high prices (even if that monopoly is state-owned).

7.2.2. RECOMMENDATIONS ON IMPROVING CURRENT HCWM PRACTICES

RECOMMENDATION 13 | A starting point for the creation of an HCWM system at the hospital level is the development of a tailored HCWM policy approved and supported by senior management (head doctors in most cases).

RECOMMENDATION 14 | Hospitals and clinics should have a separate budget line for HCWM to ensure sufficient financing (including for appropriate personal protection equipment), but oversight and monitoring of its use should follow.

RECOMMENDATION 15 | Hospitals and clinics should ensure that there is sufficient budget allocated to manage Category B waste, as it presents risks of improper final waste treatment.

RECOMMENDATION 16 | Champions of sustainable HCWM practices among HCFs employees should be identified and appointed with clearly defined responsibilities for waste management and full support from senior management.

RECOMMENDATION 17 | Periodical capacity-building should be provided to HCF staff, and monitoring and/or self-assessment of everyday practices should be ensured.

RECOMMENDATION 18 | Waste management schemes should be adapted to the local conditions in which hospitals and clinics operate, including procedures for HCW generation, sorting, labelling, collection, storage, transportation, decontamination (disinfection) and transfer to final waste treatment facilities (off site). Procedures for waste accounting and reporting should be clearly described and followed in everyday practice.

RECOMMENDATION 19 | Waste hierarchy principles should be considered when preparing internal waste management procedures or recommendations for staff dealing with waste, to minimize, reuse and recycle waste.

RECOMMENDATION 20 | Technology for decontamination, such as chemical disinfection with liquids or physical methods (thermal, microwave, radiation etc.), should be selected not only based on the cost, but also with regard to possible impacts on the environment and health.

RECOMMENDATION 21 | Sufficient premises should be provided within HCFs to ensure the appropriate storage and treatment of medical waste.

RECOMMENDATION 22 | HCFs should look for other national or international financial resources (state environmental funds, loans, grants, charitable funds etc.) to fill the gaps in the budget for HCWM (e.g. sorting measures, waste decontamination equipment (autoclaves, shredders etc.), refrigerators, appropriate premises).

RECOMMENDATION 23 | The process for procuring medical commodities and waste management services should be improved by evaluating the possibility of including criteria concerning environmental and health impacts in technical specifications (e.g. the availability of a hazardous waste management license, a permit to transport hazardous goods, a short description of the waste management technology to be used, and special criteria concerning regulated hazardous compounds or emissions).

8. ANNEXES

ANNEX 1. QUESTIONNAIRE FOR THE INITIAL ASSESSMENT OF THE CURRENT SITUATION OF HEALTH CARE WASTE MANAGEMENT

Date:	
Name of interviewee:	
Assessment made by:	

SECTIONS:

1. DESCRIPTION OF THE HEALTH CARE FACILITY (HCF)
2. STAFF AND TRAINING
3. PROTECTIVE EQUIPMENT
4. WASTE MANAGEMENT POLICY AND LEGISLATION
5. PROCUREMENT POLICY AND BUDGET
6. MINIMIZATION, REUSE AND RECYCLING POLICY
7. SEGREGATION, COLLECTION, STORAGE AND TRANSPORTATION
8. TREATMENT AND DISPOSAL
9. SOCIAL CONSIDERATIONS

1.	**Description of the health care facility (HCF)**	
1.1.	Name and location of the HCF | Назва та розташування лікарні	
1.2.	Ownership (public/private) | Власність (державна / приватна)	
1.3.	Size and profile of the HCF (Multiprofile / Single profile / Specialized / Medical establishment of special type) | Розмір та профіль лікарні (Багатопрофільна / Однопрофільна / Спеціалізована / Лікарняний заклад особливого типу)	
1.4.	Level of health care services (Emergency / Primary / Secondary / Tertiary) | Рівень медичної допомоги (Екстрена медична допомога / Первинна / Вторинна / Третинна)	
1.5.	Number of patients | Кількість пацієнтів	
1.6.	Total number of beds | Загальна кількість ліжок	

2.	**Staff and training**	
2.1.	Number of personnel (total) | Кількість персоналу (загальна)	
	✔ Medical / non-medical (number or percentage) | Медичного/не медичного (кількість чи відсоток)	

	✔ Gender (Women / men) (number or percentage) | Стать (Жінки/чоловіки) (кількість чи відсоток)	
2.2.	Is someone clearly assigned as responsible for waste management? | Чи є у лікарні людина, призначена відповідальною за поводження з відходами?	
2.3.	Who are the people (positions) involved in handling, segregating, collecting, storing and transporting medical waste within the HCF? | Хто з персоналу (посади) відповідає за збирання, сортування, зберігання та транспортування медичних відходів в межах лікарні?	
	✔ Who is responsible for medical waste treatment (including pretreatment) (if any)? | Хто відповідальний за поводження з відходами (включаючи попередню обробку) (якщо такі є)?	
	✔ Who is responsible for primary accounting and reporting? | Хто відповідальний за первинний облік відходів та звітування?	
2.4.	Are their responsibilities for HCW management procedures clearly assigned? | Чи є у них чітко визначені обов'язки щодо процедур поводження з відходами?	Yes ☐ No ☐
2.5.	Is the waste accounting procedure clearly described and approved? | Чи є процедури обліку відходів чітко визначеними та затвердженими?	Yes ☐ No ☐
2.6.	How is the accounting of waste performed? (on paper or electronically) | В якій формі ведеться облік відходів? (в паперовій чи електронній)	
	✔ Where is the primary accounting of waste performed? (individual operations / equipment / technological sites / other) | У яких місцях проводиться первинний облік відходів? (окремі операції / обладнання / технологічні майданчики / інше)	
	✔ What is the frequency of accounting for each type of waste? (every week / month / season / year) | Яка частота обліку кожного виду відходів? (щотижнево / щомісячно / посезонно / щорічно)	

	✔ Are the accounting records (special forms) available? (were shown / none) | Чи наявні форми обліку відходів? (були показані / не були)	Yes ☐ No ☐
	✔ Are the accounting reports (annual) being submitted as required? (were shown / none) | Чи подаються форми обліку відходів (річні) згідно вимог? (були показані / не були)	Yes ☐ No ☐
2.7.	Do the numbers match in waste accounting and financial reports? | Чи співпадають «цифри» в фінансовій звітності та звітності обліку відходів?	Yes ☐ No ☐
2.8.	Has any waste management training been organized for the hospital staff? | Чи організовуються тренінги з поводження з відходами для персоналу лікарні?	Yes ☐ No ☐
2.9.	What kind of waste management training is performed, and how often? (hiring / yearly / changes in legislation) (local / state / international) | Які тренінги з поводження з відходами проводяться та як часто? (при наймі на роботу / щорічно / коли відбуваються зміни в законодавстві) (місцеві / державні / міжнародні)	
2.10.	How do you evaluate the awareness of risks of people handling HCW? (excellent (high) / good / satisfactory / insufficient / bad (low) / none) | Як ви оцінюєте проінформованість людей, що працюють з медичними відходами, щодо ризиків? (чудово (високо) / добре / задовільно / недостатньо / погано (низько) / ніяк)	

3.	**Protective measures / Заходи з захисту**	
3.1.	Do people who handle medical waste have special protective measures (personal protective equipment)? | Чи володіють люди, які працюють з медичними відходами, засобами захисту (особисте захисне спорядження)?	Yes ☐ No ☐
	✔ If yes, what equipment is available to them? (gloves / boots / apron / trousers / mask / other) | Якщо так, то які засоби захисту вони застосовують? (рукавиці / захисне взуття / фартухи / штани / маски / інше)	
	✔ Is it appropriate? Is it worn? |	Yes ☐ No ☐

	Наскільки воно захищає? Цим спорядженням користуються?	
3.2.	Are regular checks carried out to ensure that protective measures are taken? | Чи проводяться регулярні перевірки використання засобів захисту?	Yes ☐ No ☐
	✔ Have all staff members been vaccinated against hepatitis A and B and tetanus? | Чи весь персонал провакцинований проти гепатитів А, В та правця?	Yes ☐ No ☐
3.3.	Is there a procedure for dealing with accidents or spills? (posters / notices / register / other) | Чи існують інструкції щодо планів дій у випадках аварій та витоків? (інформаційні плакати / повідомлення / журнали / інше)	Yes ☐ No ☐
3.4.	Are there appropriate and adequate supplies and equipment for infection prevention and waste management in case of an accident? (decontaminants / clothing / containers / other)| Чи є наявні відповідні та достатні засоби захисту та обладнання для запобігання інфікуванню та поводженню з відходами у разі надзвичайної ситуації? (знезаражувальні засоби / спеціальний одяг / контейнери / інше)	Yes ☐ No ☐
3.5.	Did you have any cases of infection of personnel dealing with medical waste? | Чи були у вас випадки інфікування персоналу, який відповідає за поводження з медичними відходами?	Yes ☐ No ☐
	✔ If yes, how did you record and investigate it? | Якщо так, де ви це зафіксували та яким чином дослідили цей випадок?	
3.6.	What financial sources are protective measures procured from? | З яких фінансових джерел закуповуються засоби захисту?	
	✔ Are they sufficient? | Чи достатньо для цього бюджету?	Yes ☐ No ☐

4.	**Waste management policy and legislation / Практика поводження та законодавство**	
4.1.	Are there any waste management regulations or rules in the HCF itself? (approved / was shown / none) | Чи існують певні внутрішні правила та інструкції з практики поводження з медичними відходами у вашому закладі? (затвердженні / показали / ні)	Yes ☐ No ☐

4.2.	Do you have an approved medical waste management scheme in the HCF? (approved / was shown / none) | Чи є у вас в лікарні затверджений план поводження з медичними відходами? (затверджений / показали / ні)	Yes ☐ No ☐
4.3.	Did you incur any penalties or mandatory orders from inspectors concerning waste management activities in the last 3 years? | Чи отримували ви штрафні санкції чи приписи від інспекцій щодо поводження з відходами протягом останніх 3 років?	Yes ☐ No ☐
4.4.	Are sustainability aspects (environmental, social and economic) incorporated into the HCF's decision-making? (Environmental Management System (EMS) / Environmental Policy / SA8000 / Code of Conduct / etc.) | Чи враховуються аспекти сталого розвитку (довкіллєві, соціальні, економічні) в процесі прийняття рішень у вашій лікарні? (Система управління навколишнім середовищем (EMS) / Екологічна політика / SA8000 / Правила поведінки / тощо)	Yes ☐ No ☐

5.	**Procurement policy and budget / Закупівля та бюджет**	
5.1.	Do you have any procurement policy for waste management services in relation to their environmental and health impact? | Чи є у вас певні правила щодо закупівлі послуг поводження з медичними відходами стосовно їх впливу на навколишнє середовище та здоров'я?	Yes ☐ No ☐
5.2.	Do you have any procurement policy for medical commodities in relation to their environmental and health impact? | Чи є у вас певні правила закупівлі медичних товарів стосовно їх впливу на навколишнє середовище та здоров'я?	Yes ☐ No ☐
5.3.	What is the role of the HCF's staff in preparing procurement documents for medical commodities and services? (by hospitals and clinics themselves or centralized)| Яка роль персоналу лікарні в підготовці тендерної документації для медичних товарів та послуг? (самостійно лікарнею чи централізовано)	
5.4.	Who decides how to proceed with waste management (local level, country level, centralized regional level)? | Хто приймає рішення стосовно поводження з відходами (місцевий рівень, державний рівень, централізовано на регіональному рівні)?	
5.5.	Do you have a budget specially allocated to waste management? | Чи є у вас бюджет, спрямований суто на поводження з відходами?	Yes ☐ No ☐
	✔ If yes, how do you allocate it? | Якщо так, як ви його розподіляєте?	

	✔ And what percentage of the HCF budget do you allocate to it? | Який відсоток бюджету лікарні він складає?	
5.6.	How do you foresee the HCWM budget for the next year? | Як ви плануєте бюджет на поводження з медичними відходами на наступний рік?	
5.7.	Do you receive special financing for waste management from the state budget? | Чи отримуєте ви спеціальне фінансування на поводження з відходами з державного бюджету?	Yes ☐ No ☐
	✔ If yes, from which sources, and how is it allocated? | Якщо так, з якого джерела (статті) та як воно розприділяється?	
	✔ Is there a trade-off in how resources are allocated? | Чи є компроміс у тому, як розподіляються ресурси?	Yes ☐ No ☐
	✔ How transparent is the budget allocation system? | На скільки прозорою є система розподілу бюджету?	
	✔ Who tracks it? | Хто її контролює?	
5.8.	Does it cover the annual cost of waste management? | Чи покриває бюджет річні витрати на поводження з відходами?	Yes ☐ No ☐
	✔ If not, why not, and what percentage is missing? | Якщо ні, чому та скільки % не вистачає?	
5.9.	What is the total cost of waste management (USD/year)? | Які загальні витрати на управління відходами (доларів/рік)?	
	✔ Specify by waste type or category (A, B, C and D). | Конкретизуйте за видом чи категорією відходів (A-D)?	
	✔ Specify by waste management process. (protection measures / training / segregation (e.g. packaging) / transportation / storage / treatment / other) | Конкретизуйте за етапами процесу поводження з відходами? (засоби захисту / тренінги / розділення (пакування) / транспортування / зберігання/ утилізація / інше)	
5.10.	Are there any additional sources for obtaining necessary HCWM commodities or services? (international funds / medicine suppliers / other) | Чи є якісь додаткові джерела для отримання необхідних засобів та послуг для поводження з медичними відходами? (міжнародні фонди / постачальники ліків / інше)	

5.11.	What are the key gaps in financing the HCWM system at the hospital level? | Які основні пробіли в фінансуванні системи поводження з медичними відходами на рівні лікарні?	
5.12.	What would you spend money on if you had enough? | Якби у вас було достатньо коштів, на що б ви їх витратили для покращення системи поводження з медичними відходами на рівні лікарні?	

6.	**Minimization, reuse and recycling policy / Мінімізація, повторне використання та переробка**	
6.1.	Do you have any procedures or recommendations as part of a waste minimization, reuse and/or recycling policy? (reduction of generated waste at source (less packaging) / returning containers to the supplier / reusable equipment / other) | Чи маєте ви певні процедури чи рекомендації з мінімізації відходів, їх повторного використання та/чи переробки? (зменшення утворення відходів в джерелі утворення (менше пакування) / повернення контейнерів постачальникам / повторно використовувані засоби / інше)	Yes ☐ No ☐
6.2.	Do you have any procurement procedures to minimize environmental impact? (PVC-free and mercury-free supplies / choice of less toxic substances / safe injection equipment / other) | Чи є у вас певні тендерні умови, що передбачають мінімізацію впливу на навколишнє середовище? (Поставки без ПВХ та ртуті / вибір менш токсичних речовин / безпечні засоби для ін'єкцій / інше)	Yes ☐ No ☐
6.3.	Which type of waste is segregated for recycling: paper, glass, metals, plastic? | Чи відсортовуєте ви для подальшої переробки такі види сміття: папір, скло, метали, пластик?	
6.4.	Are there any regulations in place for stock management in hospitals? Any requirements for mandatory stocks of medicines? | Чи існують правила щодо управління запасами в лікарнях? Якісь вимоги до обов'язкового запасу ліків?	Yes ☐ No ☐
6.5.	Do you have a procedure to reduce the quantity of expired or unused drugs? | Чи є у вас процедури для зменшення кількості протермінованих чи невикористаних ліків?	Yes ☐ No ☐
	✔ What percentage of drugs expires? | Який відсоток ліків стає протермінований?	
	✔ What are the costs of expired medicines? Who is covering these costs? | Які витрати на ліки з протермінованим терміном дії? Хто покриває ці витрати?	

	✔ What is the further handling procedure for pharmaceutical waste? | Які подальші процедури для фармацевтичних відходів?	
	✔ Is there any practice of returning waste to the supplier? Is any replacement of expired medicines envisaged? | Чи є практика постачальників приймати їх назад? Чи передбачена заміна прострочених ліків?	Yes ☐ No ☐
6.6.	What additional actions in the field of mitigation of environmental impact do you take? (projects / initiatives / other)| Чи вдаєтесь ви до будь-яких додаткових дій щодо пом'якшення негативного впливу на навколишнє середовище? (проекти / ініціативи / інше)	

7.	**Segregation, collection, storage and transport* / Розділення, збір, зберігання та транспортування**	
7.1.	Do you have an approved medical waste management scheme at the HCF? | Чи є у вас затверджена схема поводження з відходами?	Yes ☐ No ☐
	✔ If yes, for which departments? And where do you find it? | Якщо так, то для яких відділів та де її знайти?	
7.2.	What are the main steps of the waste management flow chain within and outside the HCF? (segregation / collection / transportation / storage / treatment / other) | Які головні кроки у «ланцюжку» управління відходами проводяться в та за межами лікарні? (розподілення / збір / транспортування / зберігання / утилізація / інше)	
7.3.	Is a segregation procedure for medical waste at generation source or in other handling points within the HCF clearly described? | Чи чітко описана процедура роздільного збору медичних відходів на місці утворення чи в інших пунктах лікарні?	Yes ☐ No ☐
	✔ If yes, what types of medical waste are being sorted and where? (sharps / anatomical waste / pharmaceutical waste / cytotoxic waste / radioactive waste / mercury-containing / other) | Якщо так, які види медичних відходів відсортовуються та де? (гострі відходи / анатомічні відходи / фармацевтичні відходи / цитотоксичні відходи / радіоактивні / ртутовмісні / інше)	

	✔ What kind of packaging is used for each type of waste? (box / container / bag / other) | Який вид пакування використовується для кожного виду відходів? (коробка / контейнер / пакет / інше)	
	✔ Is there sufficient packaging (boxes, containers, bags etc.) everywhere where waste is generated? | Чи достатньо упаковки (коробки, контейнери, пакети тощо) для відходів всюди, де вони генеруються?	Yes ☐ No ☐
	✔ Are the bags handled correctly (handler wearing gloves, bags closed when two-thirds full and grasped from the top, no piling of bags, no emptying of bags)? | Чи правильно поводяться із пакетами? (працівник носить рукавиці / пакети заповнюються приблизно на 2/3, пакети не навантажуються, пакети не спорожнюються)	Yes ☐ No ☐
7.4.	Is a procedure for the further management of used sharps and syringes clearly described? | Чи чітко описана процедура подальшого поводження з використаними скальпелями та шприцами?	Yes ☐ No ☐
	✔ What type of syringes do you use? (disposable / sterilizable / auto-disable / safety syringe) | Який вид шприців ви використовуєте? (одноразові / ті, що стерилізуються / ті, що автоматично відключаються / запобіжні)	
	✔ How are sharps stored at generation points? (special containers / other) | Як зберігаються гострі предмети в пункті збирання? (спеціальні контейнери / інше)	
	✔ Do the nursing staff take a sharps container to the patient's bedside? | Чи бере медперсонал контейнер для гострих предметів до ліжка пацієнта?	Yes ☐ No ☐
	✔ In the sharps container, are the needles disconnected from the syringes, with the needle cap? | Чи є в контейнері для гострих предметів голки, розз'єднані зі шприцами, голки без кришки?	Yes ☐ No ☐
	✔ How many cases of needle stick injury have been reported in the past 12 months? | Скільки випадків пошкодження голки було зафіксовано за останні 12 місяців?	

7.5.	Is a labelling procedure for medical waste within the HCF clearly described? | Чи чітко описана процедура маркування медичних відходів?	Yes ☐ No ☐
	✔ Is each type of waste clearly identified? | Чи кожен вид відходів чітко ідентифікується?	Yes ☐ No ☐
7.6.	Is segregation carried out effectively throughout the chain (from waste generation to storage (or treatment if any))? | Чи ефективно здійснюється розподілення по всьому ланцюжку (від утворення відходів до зберігання (чи обробки, якщо така є))?	Yes ☐ No ☐
	✔ Are all members of staff reminded about waste segregation procedures? | Чи всі члени персоналу пам'ятають про процедуру роздільного збору відходів?	Yes ☐ No ☐
	✔ Are checks carried out regularly? | Чи всі перевірки проводяться регулярно?	Yes ☐ No ☐
	✔ Is household waste separated from hazardous waste at source? | Чи відокремлюються побутові відходи від небезпечних відходів у джерелі утворення?	Yes ☐ No ☐
7.7.	Is a collection and transportation procedure for medical waste within HCF clearly described? | Чи чітко прописані процедури збору та транспортування відходів в межах лікарні?	Yes ☐ No ☐
	✔ Is the waste collected regularly? | Чи регулярно збираються відходи?	Yes ☐ No ☐
	✔ Do the people in charge of collecting and transporting waste use any protection measures? | Чи вживають особи, відповідальні за збирання та транспортування відходів, будь-яких засобів захисту?	Yes ☐ No ☐
	✔ Are the bags that have been collected replaced immediately with new bags? | Чи одразу ж пакети, що збираються, замінюються новими?	Yes ☐ No ☐
	✔ What kind of equipment is used for waste transportation? (open / closed / other) | Який вид обладнання використовується для транспортування відходів? (відкрите / закрите / інше)	
7.8.	Is a storage procedure for medical waste within the HCF clearly described? | Чи чітко прописана процедура зберігання медичних відходів?	Yes ☐ No ☐
	✔ Does the storage time meet the legal requirements? | Чи відповідає час зберігання вимогам закону?	Yes ☐ No ☐
7.9.	Is there a specific waste storage area within the HCF? | Чи є якесь сховище відходів в межах лікарні?	Yes ☐ No ☐
	✔ Is the area sufficient? | Чи достатня його площа?	Yes ☐ No ☐

	✔ Is it protected? | Чи воно захищене?	Yes ☐ No ☐
	✔ Does it meet all the legal requirements? | Чи відповідає воно всім вимогам закону?	Yes ☐ No ☐
7.10.	Are the cleaning procedures for waste management equipment and areas within the HCF clearly described? | Чи чітко прописані процедури очищення обладнання для відходів?	Yes ☐ No ☐
	✔ Are they performed regularly? | Чи регулярно вони проводяться?	Yes ☐ No ☐
	✔ Do they meet all the legal requirements? | Чи відповідають вони всім вимогам закону?	Yes ☐ No ☐

8.	**Treatment and disposal* / Обробка та утилізація**	
8.1.	How was the decision made concerning medical waste treatment/disposal on site vs. off site? | Як приймається рішення щодо обробки / утилізації медичних відходів на місці та поза його межами?	
	✔ What are the main criteria for the selection of waste treatment/disposal technology? (environmental / health protection) | Який головний критерій для вибору технології обробки / утилізації відходів? (довкілля / захист здоров'я)	
	✔ Who is the main decision maker? | Хто відповідальний за прийняття рішень?	
	✔ Which categories of medical waste are treated/disposed of separately? | Які види медичних відходів обробляються / утилізуються окремо?	
	✔ What are the reasons for choosing one contractor over another (value for money, choice between local/international service providers)? | За якими критеріями ви обираєте постачальника (критерій ціни, вибір між місцевим / міжнародним надавачем послуг)	
8.2.	Is the medical waste treated on site (including pretreatment)? | Чи обробляються відходи на місці? (включаючи попередню обробку)	Yes ☐ No ☐
	✔ If yes, what is the capacity (kg/day)? Is it sufficient? | Якщо так, який обсяг (кг/день)? Чи цього достатньо?	Yes ☐ No ☐
	✔ What are the main reasons for operational problems (if any)? (money / maintenance / spare parts / other) | Які основні причини проблем з експлуатацією (якщо такі є)? (гроші / технічне обслуговування / запасні частини / інше)	Yes ☐ No ☐
	✔ What do you do when it is not working? | Що ви робите, коли таке обладнання не працює?	

	✔ What are the costs? | Скільки це коштує?	
	✔ Do you have a license for waste management? | Чи маєте ви ліцензії для поводження з відходами?	Yes ☐ No ☐
8.3.	Is the medical waste treated off site? | Чи обробляються відходи за межами лікарні?	Yes ☐ No ☐
	✔ If yes, by whom and how? | Якщо так, ким та скільки?	
	✔ What is their capacity (kg/day)? | Які їхні обсяги (кг/день)?	
	✔ What are the costs? | Яка вартість?	
8.4.	Is the waste correctly packaged and labelled for off-site transport? | Чи правильно відходи упаковуються та маркуються для транспортування за межі лікарні?	Yes ☐ No ☐
	✔ Is the carrier authorized to transport dangerous substances off site? | Чи має право перевізник перевозити небезпечні речовини за межами лікарні?	Yes ☐ No ☐
	✔ Do the consignment notes meet the statutory requirements? | Чи відповідають товарно-транспортні накладні встановленим законодавством вимогам?	Yes ☐ No ☐
	✔ Is the waste collected regularly for off-site treatment? | Чи регулярно збираються відходи?	Yes ☐ No ☐
8.5.	Is particular attention paid to the treatment of sharps and highly infectious wastes (lab cultures, wastes from care of infectious patients)? | Чи приділяється особлива увага поводженню з гострими та високоінфекційними відходами (лабораторні культури, відходи з догляду з інфекційними пацієнтами)?	Yes ☐ No ☐
	✔ Are these wastes rendered harmless and unusable before being transported off site? | Чи робляться ці відходи нешкідливими та придатними до транспортування перед виїздом за межі?	Yes ☐ No ☐
8.6.	Is particular attention paid to the treatment of human organic wastes? | Чи приділяється особлива увага поводженню з органічними відходами людини?	Yes ☐ No ☐
8.7.	Is particular attention paid to the treatment of mercury-containing waste and equipment? | Чи приділяється особлива увага поводженню з відходами та обладнанням, що містять ртуть?	Yes ☐ No ☐
8.8.	Is particular attention paid to the treatment of radioactive waste? | Чи приділяється особлива увага поводженню з радіоактивними відходами?	Yes ☐ No ☐

8.9 Evaluation of the quantity of waste generated / Оцінка кількості згенерованих медичних відходів			
№	Types/quantities (kg/day, kg/year, kg/bed/day etc.) | Види / кількість (кг/день, кг/рік, кг/ліжко/день і т.д.)	Total / Всього	Total costs / Всього вартість
1.	**Category A:** Epidemiologically safe medical waste | **Категорія А** - епідеміологічно безпечні медичні відходи		
1.1.	Daily waste (that did not have contact with biological liquids of patients, infectious and dermatovenerological patients) | Щоденні відходи (які не мали контакту з біологічними рідинами пацієнтів, зараженими та та дерматовенерологічними пацієнтами)		
1.2.	Food waste (from all departments of the HCF except infectious) | Харчові відходи (з усіх відділень медичного закладу, крім інфекційних)		
1.3.	Sorted recyclable waste (plastic, paper, metal) | Відсортовані вторинні відходи (пластик, папір, метал)		
1.4.	Other solid municipal waste (including bulky waste, construction waste) from all departments except infectious (except those mentioned in 1.1–1.3) | Інші тверді комунальні відходи (включаючи сипучі, будівельні відходи) з усіх підрозділів, крім інфекційних (крім вищезазначених 1.1 - 1.3)		
2.	**Category B:** Epidemiologically unsafe (dangerous) medical waste | **Категорія В** - епідеміологічно небезпечні медичні відходи		
2.1.	Used medical instruments (sharp medical instruments) | Використані медичні інструменти (гострі медичні інструменти)		
2.2.	Organic medical waste of patients (tissue, organs etc.) | Органічні медичні відходи пацієнтів (тканини, органи тощо)		
2.3.	Food waste from infectious department | Харчові відходи інфекційного відділення		
2.4.	Laboratory waste | Лабораторні відходи		
2.5.	All other epidemically unsafe medical waste (used medical instruments, objects stained with blood or other biological liquids (e.g. cotton with blood, glass, polymer, rubber and other items) (except those mentioned in 2.1–2.4) | Усі інші епідемічно небезпечні медичні відходи (використані медичні інструменти, предмети, забарвлені кров'ю або іншими біологічними рідинами (наприклад, бавовна з кров'ю, скло, полімер, гума та інші предмети) (крім вищезазначених 2.1 - 2.4)		
3.	**Category C:** Toxicologically dangerous medical waste | **Категорія С** - токсикологічно небезпечні медичні відходи		
3.1.	Chemical and pharmaceutical waste (e.g. diagnostics, disinfection etc.) | Хімічні та фармацевтичні відходи (наприклад, предмети діагностики, дезінфекції тощо)		
3.2.	Cytotoxic waste | Цитотоксичні відходи		
3.3.	All other toxicologically unsafe medical waste (diagnostic and disinfection items, batteries, goods and equipment containing mercury or heavy metals, waste generated as a result of the operation of equipment, transport, lighting systems) (except those mentioned in 3.1–3.2) | Усі інші токсикологічно небезпечні медичні відходи (предмети діагностики та дезінфекції, акумулятори, ртутні і важкі метали, що містять предмети та обладнання, відходи, що утворюються в результаті експлуатації обладнання, транспорту та систем освітлення) (крім вищезазначених 3.1 - 3.2)		
4.	**Category D:** Radiologically dangerous medical waste (all materials resulting from the use of radioisotopes) | **Категорія D** - радіаційно небезпечні медичні відходи (усі матеріали, отримані в результаті використання радіоізотопів)		

9. Social considerations / Соціальні аспекти	
9.1. GENDER | СТАТЬ	
How diverse are genders in the hospital? • Overall staff • In management and budgeting • On the tender committee • In HCW management | Працівники яких статей працюють в лікарні? • загалом • в керівництві та бюджетному відділі • в тендерному комітеті • в управлінні з поводження з медичними відходами	
9.2. SOCIAL INCLUSION | ІНКЛЮЗИВНІСТЬ	
Are there any extra bonuses for staff? • With special needs • Women and men with special status (i.e. single or young mothers/fathers etc.) | Чи передбачені якісь додаткові бонуси для персоналу? • з особливими потребами • жінок та чоловіків з особливим статусом (самотні чи молоді матері/батьки і т.д.)	
Is your HCF equipped to accommodate persons with disabilities? | Чи облаштована ваша лікарня для вільного пересування та розміщення людей з особливими потребами?	
9.3. LABOUR RIGHTS AND WORK SAFETY | ВИРОБНИЧІ ПРАВА ТА БЕЗПЕКА ПРАЦІ	
What are the wages of employees in HCWM in a hospital? Do they have health insurance? | Яка заробітна плата працівників, які відповідають за поводження з медичними відходами? Чи мають вони медичну страховку?	
Do you have any special requirements or procedures for proper vaccination of personnel working with HCW, especially with hazardous waste? | Чи є у вас якісь особливі вимоги чи процедури щодо правильної вакцинації персоналу, який працює з медичними відходами, особливо з небезпечними відходами?	
Do employees in HCWM in a hospital undergo safety training? | Чи проходять працівники, які відповідають за поводження з медичними відходами тренінги з техніки безпеки?	
Are there any bonuses for the staff involved in HCWM? | Чи отримують працівники, які залучені в поводження з медичними відходами додаткові бонуси/доплати?	
9.4. HEALTH RISKS FOR THE LOCAL COMMUNITY | РИЗИКИ ДЛЯ ЗДОРОВ'Я ГРОМАДИ	
Are there measures in place to ensure that HCW is not negatively influencing the health of those living in surrounding areas? If so, what are those measures? | Чи існують заходи, спрямовані на те, щоб переконатись, що поводження з відходами не впливає негативно на здоров'я людей, що мешкають у прилеглих районах? Якщо так, то що це за заходи?	

Does the community have access to information on how HCW is treated or disposed of? | Чи має громада доступ до інформації про те, як медичні відходи захороняються чи утилізовуються?	
Do you consider potential health risks when choosing whether to treat the waste on site or off site? | Чи враховуєте ви потенційні ризики для здоров'я, вибираючи, чи обробляти відходи на місці чи поза лікарнею?	

ANNEX 2. LIST OF UKRAINIAN NATIONAL LEGISLATIVE ACTS ON WASTE MANAGEMENT AND HCWM

NAME OF AUTHORITY	COUNTRY- AND HOSPITAL-LEVEL LEGISLATIVE ACTS
Verkhovna Rada of Ukraine	• The Constitution of Ukraine as of 28 June 1996 • Law 'On Strategy of State Environmental Policy of Ukraine until 2030' as of 28 February 2019 • Law of Ukraine 'On Waste' as of 5 March 1998 • Law of Ukraine 'On Environmental Protection' as of 25 June 1991 • Law of Ukraine 'On Municipal Services' as of 9 June 2018 • Law of Ukraine 'On Pharmaceuticals' as of 4 November 2018 • Law of Ukraine 'On Environmental Impact Assessment' as of 23 May 2017 • Law of Ukraine 'On Strategic Environmental Assessment' as of 20 March 2018 • Law of Ukraine 'On Public Procurement' as of 1 January 2019 • Law of Ukraine 'On Sanitary and Epidemiological Safety of Population' as of 24 February 1994 • Association Agreement between the European Union and its Member States, and Ukraine, as of 16 September 2014
Cabinet of Ministers of Ukraine	• Decision of the Cabinet of Ministers of Ukraine 'On Approval of the National Strategy for Waste Management in Ukraine until 2030' as of 8 November 2017 • Decision of the Cabinet of Ministers of Ukraine 'On Approval of the National Plan for Waste Management in Ukraine until 2030' as of 20 February 2019 • Decision of the Cabinet of Ministers of Ukraine 'On Licensing Rules for Hazardous Waste Management' as of 13 July 2016 • Decision of the Cabinet of Ministers of Ukraine 'On Licensing Rules for Hazardous Goods Transportation' as of 10 March 2017 • Decision of the Cabinet of Ministers of Ukraine 'On Rules of Provision of Services of Municipal Solid Waste Management' as of 27 December 2018 • Decision of the Cabinet of Ministers of Ukraine 'On Approval of the National Strategy of Provision of Medicines to the Population until 2025' as of 5 December 2018
Ministry of Health of Ukraine	• Decision of the Ministry of Health 'On State Sanitary-Epidemic Rules and Norms of Medical Waste Management' as of 8 June 2015 • Decision of the Ministry of Health 'On Rules for Disposal and Destruction of Pharmaceutical Drugs' as of 24 April 2015 • Decision of the Ministry of Health 'On State Sanitary Norms and Rules of Keeping of the Territory of Settlements' as of 17 March 2011 • Decision of the Ministry of Health 'On State Sanitary Norms and Rules of Planning and Development of Settlements' as of 19 June 1996
Ministry of Energy and Environmental Protection of Ukraine	• Order 'On Approval of the Standard Form of Primary Accounting Documentation N 1-WT 'Accounting for Waste and Packaging Materials and Containers' and the Instruction on Filling It', as of 7 July 2008 • Order 'Technical Recommendations Concerning Development of Regional Waste Management Plans' as of 12 April 2019
Ministry of Development of Communities and Territories of Ukraine	• Order 'On Recommendations Concerning Preparation of Local Programs of Municipal Waste Management' as of 10 January 2006
State Statistical Service of Ukraine	• Order 'On Approval of forms of State Statistical Monitoring in Ecology, Forestry and Hunting' as of 19 August 2014

ANNEX 3. LIST OF LICENSED HAZARDOUS (INCLUDING MEDICAL) WASTE MANAGEMENT COMPANIES

#	NAME	WASTE MANAGEMENT OPERATIONS[48]	LOCATION OF INSTALLATION (FACILITY)
BLOCK I: COMPANIES WHICH OFFER DIFFERENT WASTE MANAGEMENT OPERATIONS WITH HAZARDOUS WASTE, INCLUDING MEDICAL WASTE			
1	Olestas eco Ltd.	Collection and storage, treatment and disposal	Cherkasy region
2	Umany-eko Ltd.	Collection and storage, treatment, utilization and disposal	Cherkasy region
3	SP-Ekonika Ltd.	Collection, transportation, storage and disposal	Donetsk region
4	Eko-energoprom Ltd.	Collection, transportation and storage, treatment and disposal	Kyiv region
5	Ukrmitbest Ltd.	Collection, transportation and storage, treatment and disposal	Kyiv region
6	Private company 'Ecological renovation of natural environment'	Collection, transportation and storage, treatment and disposal	Kyiv region
7	DSL-2010 Ltd.	Collection, transportation and storage, treatment, utilization and disposal	Kyiv region
8	Tarkom ecoservice Ltd.	Collection, transportation, storage, treatment and utilization	Kyiv region
9	Ukrekoservice Ltd.	Collection, transportation, storage, treatment, utilization and disposal	Kyiv region
10	Rei Brovary Ltd.	Collection, and storage, treatment, utilization and disposal	Kyiv region
11	Production association Ekohim Ltd.	Collection, and storage, treatment, utilization and disposal	Kyiv region
12	Ukrekologistyka Ltd.	Collection, and storage, treatment, utilization and disposal	Kyiv region
13	Kharkiv-eko Ltd.	Collection, transportation and storage, and utilization	Kharkiv region
14	Antares-7 Ltd.	Collection, transportation, storage, treatment, utilization and disposal	Khmelnytskyj region

[48] The Law on Waste gives the following definitions of waste management operations:
Treatment means the performance of any technological operations leading to a change in the physical, chemical or biological characteristics of waste, aimed at preparation for their safe storage, transportation, utilization or disposal. Disposal means operations with waste which do not lead to their utilization. Utilization means the use of waste as secondary material or energy resources.

#	NAME	WASTE MANAGEMENT OPERATIONS	LOCATION OF INSTALLATION (FACILITY)
15	Kivach Ltd.	Collection, storage and disposal	Kyiv region
16	Ekovdm Ltd.	Collection, storage, treatment and disposal	Kyrovograd region
17	Ukrainian center of waste management Ltd.	Collection, transportation and storage, treatment, utilization and disposal	Kyrovograd region
18	Ecological treatment technologies Ltd.	Collection, storage and disposal	Lviv region
19	Mittalservice Ltd.	Collection, transportation and storage, treatment and disposal	Lugansk region
20	Green port Ltd.	Collection, transportation and storage, treatment and disposal	Odesa region
21	Ukrekoprom Ltd.	Collection and storage, treatment, utilization and disposal	Odesa region
22	Private company 'Center of ecological safety'	Collection, storage, transportation, treatment and disposal	Odesa region
23	Utilvtorprom Ltd.	Collection, storage, treatment, utilization and disposal	Odesa region
24	Polekozahyst Ltd.	Collection and storage, treatment, utilization and disposal	Poltava region
25	D. Romanchyk (physical person, entrepreneur)	Collection, storage and treatment	Summy region
26	Safe technologies of utilization Ltd.	Collection, storage and treatment, utilization and disposal	Summy region
27	Vinekoresurs Ltd.	Collection and storage, treatment, utilization and disposal	Vinytsya region
28	Ukrekoproekt Ltd.	Collection, transportation and storage, treatment, utilization and disposal	Zaporizhya region
29	A-energo Ltd.	Collection and storage, treatment, utilization and disposal	Zaporizhya region
30	New ekosvit Ltd.	Collection, transportation and storage, treatment, utilization and disposal	Zakarpatya region
31	Ukrainian scientific ecological company Ltd.	Collection, storage and treatment	Zhytomyr region
32	Eko nova Ltd.	Collection, transportation, storage, treatment and utilization	Zhytomyr region

#	NAME	WASTE MANAGEMENT OPERATIONS[49]	LOCATION OF INSTALLATION (FACILITY)
BLOCK II: COMPANIES OFFERING HAZARDOUS WASTE PROCESSING SERVICES, INCLUDING MEDICAL WASTE			
1	Umany-eko Ltd.	Processing	Cherkasy region
2	Olestas eco Ltd.	Processing	Cherkasy region
3	SP-Ekonika Ltd.	Processing	Donetsk region
4	Ukrmitbest Ltd.	Processing	Kyiv region
5	Kyiv crematorium	Processing	Kyiv region
6	Eko-energoprom Ltd.	Processing	Kyiv region
7	Private company 'Ecological renovation of natural environment'	Processing	Kyiv region
8	Kivach Ltd.	Processing	Kyiv region
9	DSL-2010 Ltd.	Processing	Kyiv region
10	Ukrekoservice Ltd.	Processing	Kyiv region
11	Rei Brovary Ltd.	Processing	Kyiv region
12	Ukrekologistyka Ltd.	Processing	Kyiv region
13	Production association Ekohim Ltd.	Processing	Kyiv region
14	Antares-7 Ltd.	Processing	Khmelnytskyj region
15	Ekovdm Ltd.	Processing	Kyrovograd region
16	Ukrainian center of waste management Ltd.	Processing	Kyrovograd region
17	Ecological treatment technologies Ltd.	Processing	Lviv region
18	Ukrekoprom Ltd.	Processing	Odesa region
19	Utilvtorprom Ltd.	Processing	Odesa region
20	Polekozahyst Ltd.	Processing	Poltava region
21	D. Romanchyk (physical person, entrepreneur)	Processing	Summy region
22	Safe technologies of utilization Ltd.	Processing	Summy region
23	Vinekoresurs Ltd.	Processing	Vinytsya region
24	Ukrekoproekt Ltd.	Processing	Zaporizhya region
25	A-energo Ltd.	Processing	Zaporizhya region
26	New ekosvit Ltd.	Processing	Zakarpatya region

[49] Processing means reduction or elimination of hazardous characteristics of waste through mechanical, physical-chemical or biological treatment.

#	NAME	WASTE MANAGEMENT OPERATIONS	LOCATION OF INSTALLATION (FACILITY)
BLOCK III: COMPANIES FOR COLLECTION, TRANSPORTATION AND STORAGE OF HAZARDOUS WASTE (INCLUDING MEDICAL WASTE)			
1	Private company 'RIAL'	Collection, transportation and storage	Lviv region
2	Ekoinvestgroup Ltd.	Collection, transportation and storage	Lugansk region
3	Akros Ltd.	Collection, transportation and storage	Kyiv region
4	Ekoterra Ltd.	Collection, transportation and storage	Kyiv region
5	Rekultyvaciya Ltd.	Collection, transportation and storage	Kyiv region
6	Sigmas ekologi Ltd.	Collection, transportation and storage	Kyiv region
7	Ecological investments	Collection, transportation and storage	Kyiv region
8	NVP Kor-met Ltd.	Collection, transportation and storage	Kharkiv region
9	Dobrobut eco-Ukraine Ltd.	Collection, transportation and storage	Cherkasy region
10	Ekorensing Ltd.	Collection, transportation and storage	Cherkasy region
11	Ukrresources -2011	Collection, transportation and storage	Chernivtsi region
12	Industrial company 'Ekosphere Ltd.'	Collection and storage	Kharkiv region
13	Private company 'Modyl-BSP'	Collection and storage	Khmelnytsky region
14	Eko-trans oil Ltd.	Collection and storage	Kyiv region
15	Ekoprovide Ltd.	Collection and storage	Kyiv region
16	Center of ecosafety and hygiene Ltd.	Transportation	Kyiv region
17	Ekogarant company Ltd.	Collection and transportation	Kyiv region
18	Eko Zahyst Ukraina Ltd.	Collection and storage	Zhytomyr region

Source: Ministry of Energy and Environmental Protection, 'Registry of Licensed Companies for Hazardous Waste Management', Kyiv, 2019.

ANNEX 4. SAMPLE CHECKLIST FOR SELF-EVALUATION OF THE CONFORMITY OF HOSPITAL HCWM PRACTICES WITH NATIONAL LEGISLATION

1.	Staff requirements	YES	NO	Additional information, if any
1.1.	For the management of waste management and day-to-day management of facilities, the facility manager shall appoint a responsible person or such manager of the facility			
1.2.	Personnel in contact with waste shall undergo preliminary medical examinations (on recruitment) in accordance with the requirements of the legislation of Ukraine			
1.3.	Personnel in contact with waste shall undergo periodic medical examinations in accordance with the requirements of the legislation of Ukraine			
1.4.	When hiring staff, they must receive a compulsory briefing on the rules for the safe management of waste			
1.5.	On a yearly basis, staff must receive a compulsory briefing on the rules for the safe management of waste			

2.	Protective measures	YES	NO	Additional information, if any
2.1.	Personnel in contact with waste shall be provided with appropriate personal protective equipment			
2.2.	Notifications, records, and investigations of cases of infection of personnel with infectious diseases related to occupational activity shall be conducted in accordance with the legislation			

3.	Storage	YES	NO	Additional information, if any
Requirements for containers and container storage				
3.1.	Containers with safe waste are stored on a special site			
3.2.	The container must be located in the economic zone of the institution at a distance of at least 25 metres from medical buildings and the food block and shall have a firm cover			
3.3.	The size of the area of the container must exceed the container base by 1.5 metres in all directions			
3.4.	The storage site should be fenced			
Requirements for premises for the acceptance, decontamination and temporary storage of waste, and the washing and disinfection of racks, containers and other equipment used for the movement of waste				
3.5.	Premises are in a separate building in the economic zone with access roads			
3.6.	Premises are in warehouse enclosures, including in basements with autonomous exhaust ventilation (with the exception of incinerators, pyrolysis)			
3.7.	The premises are located at least 25 metres away from medical buildings and the food block			

3.8.	The premises shall be provided with a supply of cold hot water, a sewerage system and an autonomous ventilation system			
3.9.	The premises are conventionally divided into the following zones: 'Dirty', which includes the reception and temporary storage of incoming waste, the treatment facility, equipped with facilities for Category B waste disinfection, washing and disinfection facilities. With small volumes it is possible to temporarily store incoming waste and disinfect it in one room 'Clean', which includes a storage room for decontaminated waste, washed and decontaminated means for moving waste (possible co-location in one room), supplies, staff room, bathroom			
3.10.	Cleaning equipment must be separate for the 'clean' and 'dirty' areas, clearly marked with the types of cleaning work, used only for its intended purpose and stored separately in the closets or cabinets of the main production premises.			
3.11.	Reusable containers for the transportation of medical waste shall be washed and disinfected at least once a week; for hazardous waste, after each emptying.			
Minimum space requirements for the above-mentioned premises				
3.12.	Reception and temporary storage (accumulation) of uninfected waste: 6 m^2			
3.13.	Temporary storage of processed waste (space is provided in the absence of conditions for storage in the region): depending on the capacity of the site, but not less than 6 m^2			
3.14.	Washing and disinfection of containers, racks, carts: 4 m^2			
3.15.	Premises for temporary storage of containers, racks, carts: 8 m^2			
3.16.	Sanitary facilities (changing room, shower, bathroom, storage of toiletries): 6 m^2			
3.17.	Workplace for waste disinfection: depending on the size of the equipment, but not less than 12 m^2			
Internal temperature requirements in the above-mentioned premises				
3.18.	Reception and temporary storage (accumulation) of uninfected waste: 16 °C			
3.19.	Workplace for waste disinfection: 18–20 °C			
3.20.	Temporary storage of treated waste: 16 °C			
3.21.	Washing and disinfection of containers, racks, carts: 18 °C			
3.22.	Premises for temporary storage of containers, racks, carts: 18 °C			
3.23.	Composition of consumables: 16 °C			
3.24.	Sanitary facilities (changing room, shower, bathroom, storage of laundry equipment): 23 °C			
3.25.	Staffroom with workplace: 20 °C			

4.	**Specific requirements by waste category**	**YES**	**NO**	**Additional information, if any**
4.1.	Preparing and approval of medical waste management scheme			

Category A waste requirements **Category A waste includes the following types of waste:** ● Food waste from all departments of the establishment, except infectious ones, including venereology and physiology ● Waste that had no contact with patients' biological fluids, infectious and skin, and venereal patients ● Household waste (solid, large, repair) from all departments of the establishment, except infectious, including venereology and psychiatry.				
4.2.	Food waste shall be collected separately from other waste in reusable containers or disposable packages installed in food premises, canteens and cafeterias.			
4.3.	Temporary storage of food waste in separate special containers in the absence of specially separated refrigeration equipment shall be allowed for no more than 24 hours. Containers must be stocked for at least one day. Food waste containers are washed and disinfected after each emptying.			
4.4.	Surfaces and aggregates of large household waste that have come into contact with infected material or patients are subject to mandatory disinfection before being placed in a storage container or in a special room.			
Category B waste requirements **Category B waste includes infected and potentially infected waste that has had contact with biological media of infected material:** ● Used medical instrument (sharp objects: needles, syringes, scalpels, and their blades, glasses, ampoules, empty tubes, broken glassware, vasofixes, feathers, pipettes, lancets etc.) ● Objects contaminated with blood or other biological fluids ● Organic medical waste of patients (tissue, organs, body parts, placenta, embryos etc.) ● Food waste from infectious wards ● Waste resulting from the activities of medical laboratories (microbiological cultures and strains containing any live pathogens, artificially grown in large quantities, non-usable live vaccines, as well as laboratory cups and equipment for their transfer, nutrient residues, inoculation, mixing of microbiological cultures of infectious agents, infected experimental animals and biological waste of vivaries) ● Waste from medical-diagnostic units of establishments and dispensaries contaminated with patients' sputum, microbiological laboratories carrying out work with pathogens of tuberculosis.				
4.5.	Waste shall be subject to compulsory decontamination (disinfection) by physical methods (thermal, microwave, radiation etc.).			
4.6.	Category B medical waste is collected in solid (non-puncture) packaging (containers) or disposable soft packages.			
4.7.	Collection of Category B waste at the point of generation is carried out during the work shift. Containers for sharp tools are allowed to be filled within 3 days.			
4.8.	Non-permeable, non-puncture containers should be used to collect sharp objects. The container must have a lid that is tight and prevents it from uncontrolled opening.			
4.9.	For collection of organic, liquid waste of Category B (blood, washing, drainage liquids etc.), use sealed waterproof containers, which prevent their uncontrolled opening.			
4.10.	The containers are closed with lids. When using a soft package after filling it, the employee responsible for waste collection in the unit complies with the biosecurity requirements, tying the package or closing it, making it impossible to dispose of the waste. Category B waste is not allowed in open containers.			
4.11.	Disinfection of reusable containers for collection of Category B waste in the facility is carried out after each use.			

4.12.	Category B medical waste from clinical units is collected in containers that are moved to a waste collection facility or to a temporary storage facility.			
Category C waste requirements **Category C waste that may pose a chemical threat include:** ● Medicines, diagnostics, disinfectants ● Batteries, items containing mercury, appliances and equipment containing heavy metals ● Waste resulting from the operation of equipment, transport, lighting systems etc.				
4.13.	Waste shall be collected in labelled containers with tightly fitting lids and stored in specially designated areas.			
4.14.	Collection and temporary storage of cytostatic and genotoxic wastes, as well as all types of waste resulting from the preparation of their solutions (vials, ampoules etc.) shall not be allowed without decontamination. Medical waste shall be immediately decontaminated at the site of formation using appropriate means.			
Category D waste requirements **Category D waste includes all materials generated as a result of the use of radioisotopes for medical and/or scientific purposes in any aggregate state that exceed the permissible levels established by radiation safety standards**				
4.15.	Collection, storage, transportation and disposal of Category D waste shall be carried out in accordance with the requirements of the legislation of Ukraine on radioactive waste management and radiation safety standards.			

5	**Waste accounting and reporting requirements**	**YES**	**NO**	**Additional information, if any**
Primary accounting				
5.1.	Is there a person designated to fill in statistical form N1-BT 'Accounting for waste and packaging materials and containers'?			
5.2.	Is there an approved internal waste accounting procedure?			
5.3.	Accounting of waste is done on paper?			
5.4.	Accounting of waste is done electronically?			
5.5.	Is the list of the places where the primary accounting of waste is performed (technological sites of units or equipment or individual operations) approved by internal orders?			
5.6.	It the list of specific types of waste and packaging materials and the containers to be accounted for at each of the above-mentioned places approved by internal orders?			
5.7.	Is the frequency of accounting for each type of waste (packaging) (date) approved by internal orders?			
5.8.	Copy of statistical form N1-BT 'Accounting for waste and packaging materials and containers' for 2018			
5.9.	Copy of statistical form N1-BT 'Accounting for waste and packaging materials and containers' for 2017			
5.10.	Copy of statistical form N1-BT 'Accounting for waste and packaging materials and containers' for 2016			
Reporting				

5.11.	It there a person designated as responsible for submission of the statistical form No. 1-Waste (annual) 'Waste management for 2019'?			
5.12.	Copy of statistical form No. 1-Waste (annual) 'Waste management for 2018'			
5.13.	Copy of statistical form No. 1-Waste (annual) 'Waste management for 2017'			
5.14.	Copy of statistical form No. 1-Waste (annual) 'Waste management for 2016'			

ANNEX 5. INTERNATIONAL MINIMUM STANDARDS AND CONFORMANCE OF UKRAINIAN HCWM PRACTICES WITH THEM (BASED ON WHO GUIDELINES, 2014)[50]

DEFINITION AND CHARACTERIZATION OF HCW

Minimum approach to overall management of HCW	
All personnel dealing with HCW should be familiar with the main categories of waste as set out in either national or local regulations on waste classification.	Yes, as there is periodical training for personnel on different issues, including HCWM.
Managers responsible for HCW should conduct a walk-through of the facility to identify the medical areas that produce waste, to obtain an initial estimate of the types and quantities of waste generated, and to understand how the waste is handled and disposed of.	Yes/No, as there is an obligation to assign a person responsible for waste management and prepare the HCF's medical waste management scheme. However, there are no descriptions or recommendations about how to organize work, and in most cases it depends on personal awareness and motivation. Most HCFs have approved waste management schemes, but the majority are copied from legislation and are not adapted to the local conditions of the HCFs.
A rapid assessment, combining observations with interviews and survey questionnaires, should provide sufficient data to identify problems and begin the process of addressing them.	
Desirable improvements to the minimum approach	
Adoption of an organized approach to waste characterization to obtain accurate data to develop or improve the waste management system in use. Undertaking a formal waste assessment entails planning and preparation. From a systematic assessment, one could: • identify locations in the HCF facility where good waste segregation is undertaken and where segregation practices need to be improved; • determine the potential for recycling and other waste minimization measures; • estimate the quantities of hazardous HCW that require special handling; and • obtain data to specify and size waste collection and transport equipment, storage areas, treatment technology and disposal arrangements to be used.	Yes/No, as there is an obligation to assign a person responsible for waste management and prepare the HCF's medical waste management scheme. However, there are no descriptions or recommendations about how to organize work, and in most cases it depends on personal awareness and motivation. Most HCFs have approved waste management schemes, but the majority are copied from legislation and are not adapted to the local conditions of the HCFs.

LEGISLATIVE, REGULATORY AND POLICY ASPECTS OF HCW

Minimum approach to developing health-care waste-management policy	
Where there are no national policy, legislation or guidelines, this should not prevent a hospital or HCF from commencing a modest HCWM programme. A short document could be prepared that states the problems, sets out simple actions, identifies the stakeholders and mobilizes them to carry out the activities.	No, although there are a number of approved national policy (the National Strategy for Waste Management in Ukraine until 2030 (approved in 2017) and the National Plan of Waste Management in Ukraine until 2030 (approved in 2017)) and legislative (the Law on Waste, State Sanitary-Epidemic Rules and Norms of Medical Waste Management etc.) documents, and there is an obligation for HCFs to prepare medical waste management schemes, no special documents concerning HCWM policy and systems at national, regional or local levels have been developed.
Desirable improvements to the minimum approach	

[50] World Health Organization, 'Safe management of wastes from health-care activities', Geneva, 2014.

When setting policy and legislation, these desirable improvements should be considered: • Set a national budget to ensure that the regulations are fully complied with, and require that individual establishments do the same • Continually improve the mandatory standards of HCWM • Create an organized system of enforcement of the legislation • Create a national system of training and assessment of technical competence in HCWM • Create a system of awareness-raising, training and regular assessment of sustainable development in the management of all waste produced in HCFs.	No, although there are a number of approved national policy (the National Strategy for Waste Management in Ukraine until 2030 (approved in 2017) and the National Plan of Waste Management in Ukraine until 2030 (approved in 2017)) and legislative (Law on Waste, State Sanitary-Epidemic Rules and Norms of Medical Waste Management etc.) documents, and there is an obligation for HCFs to prepare medical waste management schemes, no special documents concerning HCWM policy and systems at national, regional or local levels have been developed.

HCWM PLANNING

Minimum approach to planning	
Managing HCW safely requires clear objectives and planning at national and local levels. HCWM should involve national partners and stakeholders, and be based on priorities identified by all partners and stakeholders.	No, although the National Strategy for Waste Management in Ukraine until 2030 (approved in 2017) outlined the main directions of state regulation on waste management (including medical waste) in Ukraine for the next 10 years in line with key EU waste directives, the adoption of necessary laws and by-laws is lagging behind schedule. Furthermore, no HCWM system at national, regional or local level has been developed. According to the National Plan of Waste Management in Ukraine until 2030 (approved in 2019), two ministries (the MOH and the MOEEP), with the involvement of other related stakeholders, are assigned to make an inventory of medical waste management facilities, evaluate their existing capacities and create the necessary infrastructure up to 2030.
Desirable improvements to the minimum approach	
Possible improvements: • HCW generation is understood in more detail for each department in an HCF. • HCWM is defined as a concern and a priority at national and local levels. • Resources can be mobilized within a country to begin and sustain improvements to HCWM. • Waste management committees have been formally set up in each HCF as part of the serious management of infection control.	No, although the National Strategy for Waste Management in Ukraine until 2030 (approved in 2017) outlined the main directions of state regulation on waste management (including medical waste) in Ukraine for the next 10 years in line with key EU waste directives, the adoption of necessary laws and by-laws is lagging behind schedule. Furthermore, no HCWM system at national, regional or local level has been developed. According to the National Plan of Waste Management in Ukraine until 2030 (approved in 2019), two ministries (the MOH and the MOEEP), with the involvement of other related stakeholders, are assigned to make an inventory of medical waste management facilities, evaluate their existing capacities and create the necessary infrastructure up to 2030.

HCW MINIMIZATION, REUSE AND RECYCLING

Minimum approach to waste minimization

The waste minimization hierarchy should feature in the waste management policy of all HCFs, with a broad aim to move current practices upwards in the hierarchy from predominantly disposal to an emphasis on recycling or even prevention.	No, as there are no special obligations or recommendations on waste minimization at HCFs, there is no real action taken in this field.
Educate staff to use medical materials carefully to avoid generating unnecessary waste.	Yes, but this most likely happens because of the lack of medical materials, and not because of special education or awareness of staff.
Reuse is another option for minimizing waste, but it is not without complications and requires a realistic assessment of which reuse practices are considered safe and which to avoid because the risk of infection transmission to patients and staff is unacceptable.	Yes, as HCFs are still practising the use of sterilization (e.g. autoclaves or microwaves) for reusable medical devices.
Desirable improvements to the minimum approach	
Encourage staff to reduce the amount of waste generated by setting waste minimization targets for each area of medical or support activities, and people can be made more personally responsible for waste minimization, possibly by providing incentives for those people and departments who are successful in achieving their targets.	No. As there are no special obligations or recommendations for HCFs to minimize waste or reduce their impact on the environment, there is no real action taken in this field.
Apply life-cycle management for items used in large quantities and for frequently used services.	
Work with suppliers to make available products from materials that degrade more easily or that can be used again for secondary purposes.	

SEGREGATION, STORAGE AND TRANSPORT OF HCW

Minimum approach to segregation, storage and transport	
The minimum standard is a 'three-bin system', where separate containers are provided for infectious waste, used sharps and general waste.	No, HCFs use different separation systems (three or more bins), as there is no clear description of how they should sort the waste.
Waste is segregated at generation points (typically waste items contaminated with body fluids and used sharps).	Yes, sorted at generation points.
Infectious waste, general waste and used sharps are stored in separate colour-coded containers and locations within medical areas, and subsequently at a central storage site at a HCF.	No, different colour-coded containers are not used, while in general there is a lack of sorting measures. Yes, most HCFs have separate temporary storage places (at each department or common for the whole HCF), but in general they lack special storage facilities.
Central storage area(s) are fenced, lockable and isolated from patients and the public.	Yes, they are locked and isolated from patients and the public.
Maximum storage times before treatment or disposal of infectious waste are not longer than as follows: • Temperate climate: 72 hours in winter and 48 hours in summer • Warm climate: 48 hours during the cooler season and 24 hours during the hot season.	Yes, maximum storage (before disinfection) at generation points is only one shift (3 days for sharps), but disinfected waste is stored in temporary storage places for much longer (sometimes half a year).
Staff receive instruction on three-bin waste segregation and the safe handling and storage of HCW.	Yes, during training.
Staff are aware of how to protect themselves from injuries and infection from waste.	Yes, after training.
Waste containers and storage areas are cleaned regularly.	Yes, after each use.
General waste and infectious HCW is collected separately and at least once a day.	Yes, after each shift waste is collected from generation points (3 days for sharps), but disinfected waste is stored in temporary storage places for much longer (sometimes half a year).

Collection is at regular times and is reliable.	Yes, after each shift waste is collected from generation points (3 days for sharps), but disinfected waste is stored in temporary storage places for much longer (sometimes half a year) until pick-up on demand.
Waste containers and on-site transport trolleys are closed with lids to isolate waste from patients and the public.	No, old and open trolleys are used. Yes, most containers are closed with lids.
Where waste is transported off site for disposal, the vehicle is able to carry waste in a closed or covered container, and the driver knows what to do if there is an accident or incident during transportation on public roads.	No information is available about off-site transportation, as this is "not the HCF's responsibility".
Transport staff are vaccinated at least against hepatitis A and B, polio and tetanus.	No information is available about off-site transportation, as this is "not the HCF's responsibility".
Waste containers, trolleys and vehicles are maintained and cleaned regularly.	Yes, after each use.
In emergency situations, all waste from patients arriving at an HCF could be classified as potentially infectious to minimize the transmission of secondary infection.	No, as there is no such requirement.
Desirable improvements to the minimal approach	
Develop more detailed arrangements for waste storage and transport in a waste management plan.	Yes, there is legal obligation to prepare a medical waste management scheme, but not all HCFs have it, or it is prepared as an 'official paper' without any adaptation to local conditions.
Explore opportunities for reducing, reusing and recycling some of the HCW produced at the facility.	No, as there is motivation and limited access to sorting measures, space or service suppliers to collect segregated waste streams (plastic, paper, glass or metal). But there are HCFs that already sort plastic waste (sometimes paper) for recycling.
Include waste storage and transport expenses in the annual budget.	No, as in general there is no separate budgeting for waste management.
Institute separate chemical and pharmaceutical waste segregation and storage management.	No, as there is no separate chemical and pharmaceutical waste management system.
Develop a separate storage and documentation system for chemical waste, which could include separate storage zones for: • flammable liquids; • bio-toxic compounds; • corrosive wastes—acids; and • caustic wastes—bases; and • chemical waste management is included in training activities.	No, as there is no separate chemical waste management system; furthermore, HCFs in general lack on-site waste management facilities.

TREATMENT AND DISPOSAL METHODS

Minimum approach to treatment and disposal	
Hazardous HCW should be treated to reduce the potential for harm.	Yes, there is a legal obligation for the compulsory decontamination (disinfection) of Category B waste by physical methods (thermal, microwave, radiation etc.). Mostly, HCFs use liquid disinfection, as they lack other types of waste decontamination technology.
Segregation and other practices minimize the amount of waste that needs to be treated.	Yes, medical waste is segregated into different streams.
The treatment process achieves at least the minimum required disinfection level.	Yes, there is a legal obligation for the compulsory decontamination (disinfection) of Category B waste by physical methods (thermal, microwave, radiation etc.). Mostly, HCFs use liquid disinfection, as they lack other types of waste decontamination technology. Unfortunately, there are cases of HCFs lacking disinfection liquids or disinfectants not covering all the waste.

Safe disposal	Yes/No. HCFs declare that they have contracts with waste management companies, but they are not sure (and do not really care) how their HCW is treated off site. In general, HCFs lack adequate financing for waste management, and the "amount of waste transferred to contracted waste management companies depends directly on the amount of budget allocated".
Treatment can be done on the premises or at a centralized treatment facility.	Yes, initial disinfection is made at all HCFs, and later waste is transferred to contracted waste management companies for final treatment.
When treating waste on site, the technology should be carefully selected based on waste characteristics, technology capacity and requirements, environment and safety factors, and cost: • in low-income settings, modifying an existing autoclave or using a commonly available disinfectant such as hypochlorite; or • using small steam treatment units; or • using existing incinerators with air-pollution control equipment.	Yes/No. The main criteria for the selection of on-site treatment technology are cost and the availability of any existing equipment (e.g. autoclaves, microwaves etc.). Most HCFs use liquid disinfection. On-site incinerators are mostly old and without any air-pollution control equipment.
Anatomical waste can be buried in cemeteries or approved burial sites.	Yes, they are buried or incinerated.
Except for sharps, treated waste can be disposed of with regular MSW.	Yes, disinfected waste is landfilled or incinerated.
In extreme circumstances where no treatment is possible, hazardous HCW from small HCFs could be buried within the premises of the facility where public access can be restricted. Larger HCFs should make arrangements with a local landfill to provide a special cell or pit, daily soil cover and restricted access. Encapsulation, inertization and land disposal could be used for some pharmaceutical and chemical wastes, as well as sharps. A well-designed sharps pit is another minimum option for sharps.	No, as there is no such requirement.
Desirable improvements to the minimum approach	
Improve segregation and waste minimization.	
If autoclaves, microwave units or other steam-based technologies are used: • add a shredder, grinder and/or compactor, especially for sharps; • schedule regular validation tests, document test results and improve ventilation; and • adopt good preventive maintenance procedures.	Yes, the regular validation tests and preventive maintenance procedures are followed, but sometimes they might be insufficient due to limited budget. No, the upgrading of equipment or improving of ventilation is limited due to a lack of financing.
If chemical treatment systems are used: • take extra precautions to ensure the safety and health of their workers; • use less hazardous but equally effective chemical disinfectants; • minimize the environmental impact of air, liquid and solid releases of the chemical residues or by-products; • the facility should conduct periodic validation tests and adjust the treatment parameters using the minimum effective chemical concentrations; and • periodic maintenance is essential.	Yes, workers are equipped with personal protective equipment, although sometimes they are lacking; periodic validation tests and maintenance are performed according the instructions. No. Although there is an expressed need for less hazardous and more user-friendly chemical disinfectants, there are no real measures to minimize environmental impact.

If waste incineration is used: • minimize air emissions by adding air-pollution control devices or upgrading the existing flue gas cleaning system; • adapt the primary measures outlined in the BAT/BEP guidelines of the Stockholm Convention; • ensure proper handling and disposal of toxic incinerator ash; • incinerator stack tests can be expensive but are a necessary tool for improving the combustion process and for ensuring compliance with emission limits; • install continuous emissions monitoring systems; • periodic maintenance is essential; and • if the incinerator is reaching the end of its life, priority consideration should be given to alternative technologies with lower pollutant releases.	No, as incinerators at HCFs are old and without any air emissions control or cleaning system; there are no data about the treatment of ash. Yes, periodic maintenance is undertaken.
If waste is landfilled, the HCF could work with other stakeholders and the local municipal authorities to upgrade the existing landfill or construct a sanitary landfill, if necessary, for the safe disposal of waste in the area.	No, as in general HCFs lack financing for HCWM.

ECONOMICS OF HCWM

Minimum approach to HCWM costing	
To obtain a sustainable financing system for managing HCW, the costs should be included in the HCF's annual financial budget planning as an indicated budget line, so that expenditures can be monitored and tracked. The budget should at least cover the following costs: • sharps containers or safety boxes; • bins or bags in different colours to segregate hazardous waste and general HCW; • waste handling, personal protective equipment and cleaning supplies; • treatment and disposal; • repair and maintenance; and • personnel (waste handlers).	No. As there is no legal obligation, HCFs have no special lines in their budget, and there is no real possibility of monitoring and tracking it; in most cases, the budget covers only the minimum (but not necessary) expenses for HCWM and preventive measures.
Desirable improvements to the minimum approach	
Improvements to the minimum approach that can be included in the budget are: • information and education materials (e.g. posters and labels); • transport trolleys; • personnel cost (HCW officer, waste treatment supervisor, staff immunization etc.); • training in HCWM; • improved storage infrastructure (storage bins and compounds etc.); • upgraded treatment units to modern, environmentally friendly treatment technologies; • improved transport vehicles; and • final waste disposal in a sanitary landfill.	No. As there is no legal obligation, HCFs have no special lines in their budget, and there is no real possibility of monitoring and tracking it; in most cases, the budget covers only the minimum (but not necessary) expenses for HCWM and preventive measures.

ANNEX 6. KEY GAPS IN FINANCING THE HCWM SYSTEM AT HOSPITAL LEVEL AS IDENTIFIED BY THE HOSPITAL REPRESENTATIVES INTERVIEWED

PROCESS	CITY CLINIC	REGIONAL HOSPITAL	PUBLIC CHILDREN'S CLINIC	REGIONAL HOSPITAL	PERINATAL CENTRE	PRIVATE CHILDREN'S CLINIC	MILITARY HOSPITAL	CITY ONCOLOGY CLINIC	TOTAL
Better quality and user-friendly disinfectants	x								**1 / 8**
Sufficient premises for storage and/or pretreatment	x			x					**2 / 8**
Pretreatment equipment (autoclave with shredder, microwaves or incinerator)	x	x			x		x	x	**5 / 8**
Special (or more) staff assigned for waste treatment	x	x					x		**3 / 8**
Primary segregation/disinfection measures (containers)	x	x	x	x		x		x	**6 / 8**
Transportation equipment (trolleys)	x	x							**2 / 8**
Storage measures (containers)	x								**1 / 8**
Sufficient personal protection measures (e.g. gloves and respirators)	x	x		x					**3 / 8**
Training/recommendations			x			x			**2 / 8**
More frequent transfers of waste (shorter accumulation and storage time)			x				x		**2 / 8**
Higher salaries and bonuses				x					**1 / 8**

ANNEX 7. APPLICATION OF WASTE TREATMENT TECHNOLOGIES IN THE HOSPITALS AND CLINICS INTERVIEWED

PROCESS	TECHNOLOGY	CITY CLINIC	REGIONAL HOSPITAL	PUBLIC CHILDREN'S CLINIC	REGIONAL HOSPITAL	PERINATAL CENTRE	PRIVATE CHILDREN'S CLINIC	MILITARY HOSPITAL	CITY ONCOLOGY CLINIC	TOTAL
Reuse	Sterilization of multipurpose (reusable) medical devices	x	x	x	x	x	x	x	Not disclosed	**7 / 8**
Pretreatment technologies (on site)	Liquid disinfection	x		x	x	x	x	x		**6 / 8**
	Autoclaves		x							**1 / 8**
(Category B)	Incinerator (anatomical)					x				**1 / 8**
	Not disclosed *								x	**1 / 8**
Final treatment technologies (off site)	Recycling (plastic—Categories A, B)	x		x	x	x		x		**5 / 8**
	Recycling (glass—Categories A, B)				x			x		**2 / 8**
	Incineration (Category B)	x	x	x	x	x	x			**6 / 8**
	Incineration (anatomical—Category B)	x	x							**2 / 8**
	Incineration (SMW—Category A)	x								**1 / 8**
	Landfill (SMW—Category A)	x	x	x	x	x	x			**5 / 8**
	Burial (anatomical—Category B)				x					**1 / 8**
	Not disclosed *							x	x	**2 / 8**

*Refused to disclose the information

ANNEX 8. DEVELOPMENT OF THE LITHIUANIAN HCWM SYSTEM OVER THE LAST 10 YEARS

YEAR	DEVELOPMENT/EVENT	REMARKS
2000	Hygiene Norm HN 66:2000 approved by the Ministry of Health	First requirements for medical waste management on site. Prohibition of pretreatment by using chemical disinfection if waste is destined for incineration.
	Regulations on Waste Landfills approved by the Ministry of Environment	Disposal of infected medical waste and other medical waste is prohibited for all types of landfill.
2006–2011	Start of operation of the first 'centralized' medical waste incineration company in Lithuania	About 700 tons per year of medical waste were incinerated (about 40–50 per cent of the total stream), and very small amounts were exported (1–2 per cent).
2008	Updated Hygiene Norm 66:2008 approved by the Ministry of Health	Requirement to pack infected medical waste in yellow-coloured packaging was added (at the initiative of waste management companies).
2011	Environmental permit for waste incineration company was suspended by the institution responsible	The main reason for suspension was the absence of a properly certified continuous monitoring system.
JUNE–SEPTEMBER 2011	Countrywide emergency announced	After the closure of the only medical waste incineration company, the HCWM system collapsed. A number of new players entered the market as waste exporters and private medical waste pretreatment companies.
2011–2015	No new capacities for off-site medical waste treatment were established, and most medical waste was exported (pretreated and not pretreated), mostly to Latvia. National financing was provided for about 10–20 on-site (including 2 off-site) medical waste pretreatment facilities.	During this period a number of waste management companies had permits for pretreatment. It is likely that after pretreatment waste was disposed of in landfills, but no detailed statistical data on this issue are available (after pretreatment, the waste classification code changes).
2013	Updated Hygiene Norm 66:2013 approved by the Ministry of Health	The requirement for yellow-coloured packaging was removed (due to a lack of common agreement among different waste management companies). The requirement to provide medical waste accounting statistical reports to public health centres was removed (to avoid double accounting requirements, as HCFs were obliged to provide waste reports to the institution supervised by the Ministry of Environment).
2015	Two waste incinerators started operating: Fortum Klaipeda, a private operator of a non-hazardous waste incineration facility, started to receive non-hazardous medical waste for incineration; and Toksika, a state-owned hazardous waste (including medical) incineration facility.	'Stabilization period': About 45 per cent of medical waste in Lithuania is incinerated, exports account for only about 10 per cent, and the amount recycled is very small: about 1 per cent. About 40 per cent of medical waste is reported as pretreated; however, as the waste classification code changes after pretreatment, there is no way to evaluate final treatment options for this waste (i.e. a lack of traceability).

2020	Two new waste incinerators are foreseen to start operating.	Although it is not known if they will be allowed to incinerate non-hazardous medical waste (or pretreated waste), it is anticipated that they could help decrease the cost of medical waste treatment, which is currently unreasonably high because of the virtual monopoly of the medical waste treatment companies.

ANNEX 9. HAZARDOUS HCWM COMPANIES IN LITHUANIA (ATVR, 2019)

HAZARDOUS HCWM ACTIVITY	NUMBER OF COMPANIES IN ATVR*	REMARKS
Transportation and collection	19 companies, including 2 HCFs** and 1 municipal civic amenity company	All these companies are also registered for non-hazardous medical waste transportation and collection
Storage	9 companies, including 2 HCFs**	All these companies are also registered for non-hazardous medical waste storage
Recycling	Not allowed by Lithuanian law	4 companies are registered for non-hazardous plastic medical waste recycling
Pretreatment	6 companies, including 2 HCFs**	15 companies are registered for non-hazardous medical waste pretreatment
Hazardous waste (including HCW) incineration	JSC Toksika	1 hazardous waste management incineration facility in Lithuania (state-owned); non-hazardous medical waste is incinerated by JSC Fortum Klaipeda***

*There are several HCW exporting companies registered in the ATVR; however, a special permit (notification) from a competent authority is required for the export of hazardous waste, and this information is not publicly available.

**In Lithuania, HCFs that are only treating their HCW do not fall under the waste permitting and licensing scheme; only if HCFs are treating medical waste received from other HCFs are they obliged to obtain a permit and/or licence and to register in the ATVR as a waste management company.

***Different accounting requirements from different institutions resulted in almost double the difference in waste quantities