

CHANGES IN THE SYSTEMS OF MEDICAL WASTE MANAGEMENT IN PUBLIC HEALTH PROTECTION INSTITUTIONS OF LUBUSKIE VOIVODSHIP 2007-2011-RESEARCH RESULTS

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Abstract:

The paper discusses the problem of operation of medical waste management systems in the lubuskie voivodship local government health protection institutions 2007-2011. Based on the conducted research, 65% of the existing health protection institution subordinated to the Marshal Office of lubuskie voivodship presents endogenic changes of waste management systems mainly affected by the financial standing of the medical services sector.

Key words: medical waste, waste management, health care units

INTRODUCTION

Observed within recent years difficult financial situation in the sector of public health protection institution requires seeking rational actions in the management sector focusing mainly on economic savings. In the logical way these tasks should refer to all aspects of operation of the health protection institution and affect the evolution of the waste management systems. It should be made by minimizing the waste production through decreased consumption of raw materials and energy and reduced costs related to their recycling. Therefore the paper presents the problem of operation of medical waste management systems in the voivodship local government health protection institutions of lubuskie region 2007-2011. It focuses on endogenic changes within them affected by the financial condition of the medical sector. Additionally the paper specifies factors which influence the efficiency of the medical waste management system and defines different types of them. Moreover the most important threats resulting from them were determined.

65% of the existing public medical health institutions subordinated to the Marshal Office of Lubuskie voivodship 2007-2011 were analyzed as well as materials available in the statistical base of the Regional Research Center of the Main Statistical Office in Zielona Góra

THE PROBLEM OF MEDICAL WASTE MANAGEMENT IN MODERN HEALTH PROTECTION INSTITUTIONS

Medical waste in the modern health protection institution is a crucial problem. This is because many risks concerning them. The subject literature defines medical waste as solid, liquid and gas products occurring at treatment, diagnosis and prevention in medical practice of hospitals and other medical institutions as well as research institutions. Pursuant to § 2 of the Regulations of the Minister of Health of 23.08.2007 on the specific procedure of dealing with medical waste is classified as follows [4]:

- medical waste with codes 18 01 02*, 18 01 03*, 18 01 80* and 18 01 82* – means „infectious waste [5]”, is hazardous waste which contain living microorganisms or their toxins which are known or which provide reasonable background to believe that they cause infectious diseases of other people or living organisms,

- medical waste with codes 18 01 06*, 18 01 08* and 18 01 10*, is special [6], hazardous waste which contain chemical substances causing non-infectious diseases of people or other living organisms or which could be the source of environment contamination,
- medical waste with codes 18 01 01, 18 01 04, 18 01 07, 18 01 09 and 18 01 81 refers to "remaining [7]", not hazardous medical waste.

Poland produces about 200 thousand tons of medical waste, including 80% of municipal waste which does not pose sanitary risk. The other 20% of the total mass of produced waste is specific waste which require appropriate disposal. [2] Therefore the medical institutions are required to appropriately collect and then dispose it to avoid biological contamination which could be caused by such waste. Otherwise there could be a very diverse mixture of different types of waste, beginning from typical municipal waste (e.g. food, packaging) through toxic chemicals (e.g. medicines) and furthermore biologically infected (e.g. tools, dressings).

THE ORGANIZATION OF MEDICAL WASTE MANAGEMENT SYSTEMS IN HEALTH SERVICES INSTITUTIONS

Waste management covers all actions intended to minimize, use or dispose medical and veterinary waste as well as total ad comprehensive sources of their origin, methods of collecting them, identification and transportation control, technologies of processing them with degradation and assessment of environment contamination, measurement of liquid and gas emission including the analysis of the activities cost [1].

Hospital infections mean currently a significant challenge for the world and Polish medicine and management sciences. A hospital as an important health protection institution is a company which produces waste including waste produced in our homes as well as those which are risky for people and environment. Therefore relevant management and in particular supervision of processing waste in terms of epidemiology and work safety is an important factor in preventing from infections and requires developing appropriate-efficient system.

Waste management apart from the prevention of epidemiological and environmental infections is also economically important. This is because, waste management and disposal creates a significant financial burden. Depending on the type of the institution it may be from several to several hundred thousand annually or more.

In the practical operation of Polish health protection institutions it is possible to observe a defective method of waste management system including among others inappropriate waste segregation, qualifying too many waste as hazardous, sending waste which could be recycled to the dumping site. All those acts generate additional costs.

It is logical that the problem of generating waste cannot be avoided in such institutions but the economic rationality together with care for epidemiological safety creates the necessity to develop in health protection institutions relevant procedures, operation standards which lead to diminishing their quantity and at the same time contribute to efficient waste handling procedures. It seems that the key to efficient waste management is:

1. Segregation into respective categories of place and time of their origin.
2. Appropriate waste division, depending on the level of risk and type of material to standardise them.
3. Knowing the content and type of different waste groups and which lead to the improvement of waste recycling or disposal.
4. Actions taken to maximise efficient selective collection which depend on knowing rules of waste selection and quantity, location and marking containers.
5. Adopting of relevant segregation procedures directly contributes to the cost and method of further waste processing.

Knowledge and correct classification of produced waste is required to plan the waste management. Appropriate and efficient planning and then implementation brings significant benefits for the institution. Table 1 presents some of them.

Table 1
Selected benefits of waste management segregation in health protection institution

Internal	External
elimination of fees and fines for incorrect handling of waste,	increasing positive relations with the environment
raising personnel awareness in terms of environment safety and waste disposal costs,	decreasing influence on environment
developing new for waste recycling (as secondary raw materials) - saving raw materials and energy	improving competitive advantage on the market of medical services
facilitating the preparation of the health service institution to implement e.g. quality management system in line with ISO 9001, environment management system according to ISO 14001 and/or health and safety at work PN-N 18001.	diffusion of good practices of waste management to the environment

THE LOCAL GOVERNMENT HEALTH PROTECTION INSTITUTIONS OPERATING IN LUBUSKIE VOIVODSHIP – DESCRIPTION OF THE RESEARCH AREA

There are 15 voivodship local government health protection institutions, 14 out of them are Independent Public Healthcare Institutions and only one-Lubuskie Specialist Pulmonology and Cardiology Hospital in Torzym-since 3.09.2010 operates as Sp. z o.o. (Ltd) with Lubuskie voivodship acting as the only shareholder. The next institution to be transformed is also Independent Public Hospital for Mental Diseases in Międzyrzecz which is to operate based on similar rules to Torzym. Despite significant problems with debts (the total debts of all lubuskie voivodship hospitals as at 16 April 2012 is PLN 350 M) [3] within 2007-2011 no institution made restructure to reduce them.

The local government of the voivodship as the institution establishing health protection institutions controls them pursuant to the act of medical activity of 15 April 2011 [8] and the Regulation of the Minister of Health of 18 November 1999 on detailed rules of supervision of public healthcare institutions [9]. The council is exclusively responsible for creation, transformation and closing as well as providing equipment – par. 18(19)(f) of the act of 5 June 1998 on local government of voivodship [10], including the approval of charters and amendments made to the charters of such institutions.

The tasks of the Management Board of the voivodship cover management, coordination and control of the health services institutions including the appointment and dismissal of managers and appointment of Social Councils and Supervisory Boards (as in Torzym), convention of meetings and adoption of charters of Social Councils and Company Supervisory Boards.

As at 1 April 2012 15 health protection institutions were subordinated to the local government of the voivodship i.e.:

1. Regional Hospital SPZOZ in Zielona Góra.
2. Regional Hospital for Mentally Ill SPZOZ in Cibórz.
3. Lubuskie Specialist Pulmonology and Cardiology Hospital SPZOZ in Torzym.
4. The Lech Wierusz Lubuski Rehabilitation and Orthopedic Center in Świebodzin SPZOZ.
5. Independent Public Health Care Institution Children and Youth Treatment Center in Zabór.
6. Center for Addicted People SPZOZ "Nowy Dworek".
7. Independent County Public Hospital in Gorzów Wielkopolski.
8. Independent Public Hospital for Mentally Ill in Międzyrzecz.
9. Regional Emergency Station SPZOZ in Zielona Góra
10. Independent Public Health Care Institution 'MEDKOL' in Zielona Góra.
11. Regional Center of Addiction and Co-addiction therapy in Zielona Góra.
12. Independent Public Health Care Institution „Obwód Lecznictwa Kolejowego” in Gorzów Wielkopolski.
13. Independent Public Regional Emergency Station in Gorzów Wielkopolski.
14. Regional Industrial Medicine Center in Zielona Góra.
15. Regional Industrial Medicine Center in Gorzów Wielkopolski.

THE ANALYSIS OF WASTE MANAGEMENT SYSTEMS OF INDEPENDENT HEALTH PROTECTION INSTITUTIONS SUBORDINATED TO THE LOCAL GOVERNMENT OF LUBUSKIE VOIVODSHIP 2007-2011-RESEARCH RESULTS

The research was made in Q1 2012 among 65% of Public Health Care Institutions subordinated to the Marshall Office of Lubuskie Vovodship 2007-2011. A questionnaire was applied.

The research shows that injections including blood samples, analytical tests of biological materials and finally dressings mainly contributed to medical waste among different types of medical services offered in public health care institutions subordinated to the local government in lubuskie voivodship. Next in terms of the number of produced waste were surgical procedures, cytostatic treatment and microbiological tests. 20% of the analysed medical institutions declared the possession of own waste treatment plants (mainly biological waste treatment plants), 40% of them disposed waste directly to the municipal sewerage system without any form of waste treatment or pre-treatment. This could logically create a potential epidemiological risk. Other institutions disposed waste to own hospital cesspools.

The research also disclosed that the global amount of all waste in the analysed local government health care institutions regularly increases. However the dynamics of such increase significantly declined 2009-2010. The relations are presented in diagram (fig. 1).

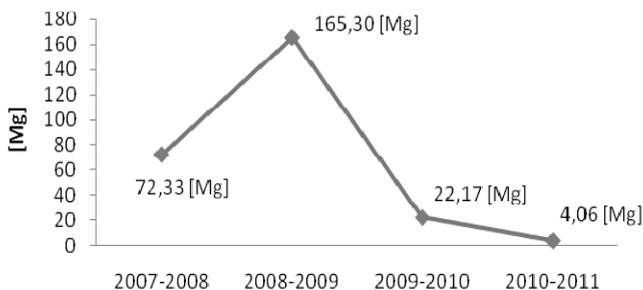


Fig. 1. Dynamics of medical waste increase

At the same time global costs of waste management of the entire analysed group 2007-2011 proved regular growth. This relation is presented in table 2.

Table 2
Approximate cost (global) of all waste management systems in health protection institutions subordinated to the Marshall Office of Lubuskie Voivodship 2007-2011

Costs per years (in PLN)				
2007	2008	2009	2010	2011
299853.3	288676.7	657108	676612.5	894255

However the analysis of cost variation per unit cost of 1 ton of medical waste management from A, B, C group focusing to specify the economic efficiency of the system provides very interesting information. 2007-2010 the average

recycling cost of 1 ton of medical waste gradually decreases (diagram – fig. 2).

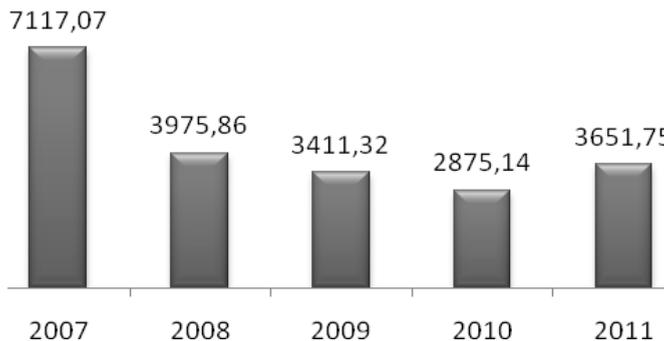


Fig. 2. Average waste management costs, per unit, per 1 ton of waste management 2007-2011 (in PLN)

Observed in 2007-2010 decrease of the average costs of management of 1 ton of waste may prove the improvement of the economic efficiency of existing in the analysed institutions waste management systems. This can be confirmed by the decrease of the average cost of "service" of 1 ton of waste comparing to their growing quantity.

However the sudden observed on the diagram no.2 increase of the average unit cost in 2011 could be the result of inflation pressure observed in the economy, due to the increase of indirect costs i.e. energy or transportation. This can also prove disproportionate increase of the average unit cost of waste management comparing to their increased quantity.

CONCLUSIONS

The problem of waste management in lubuskie health protection institutions (and not only there) is constantly important and up-to-date due to the related risks and will even grow in importance in the future. It can be proved by the constantly growing production volume in the analysed period which specified certain long-term trends and gradually increasing in 2007-2011 global costs of its recycling. All these aspects combined with the difficult financial situation of the Polish health protection system would be a significant challenge they have to face in the next years. The research made clear that the analysed Independent Public Health Protection Institutions operating in the difficult financial situation of the health sector in 2007-2010 gradually increased the efficiency of waste management systems so the average cost of 1 ton of waste management recycling gradually decreased in that period. This could be expressed by seeking improvements in that area focusing on financial savings for growing quantity of produced waste 2007-2010. Interestingly enough the research showed as well that the external inflation pressure related probably with the observed prices increase in the national economy in 2011 could affect the decrease of this efficiency. Therefore public authorities who specify the areas of operation of such institutions should be responsible for considering those issues when developing waste management programs and instruments supporting restructure and improvement of waste management systems of the institutions of the Polish medical services sector.

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