

## METHODOLOGY OF MEDICAL WASTE DISPOSAL IN MONTENEGERO

Private clinics send their reports to state official authorities via correspondents

The question is to what extent do private clinics follow required recommendations and rules, if we take into consideration the fact that the official and authorized Environmental Inspector had from 2016 till present, submitted and filed seven charges, initiating and demanding misdemeanor procedures directed against health institutions for mixing medical and municipal solid waste.



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Have you ever found yourself in a situation where you had no idea what to do with medicaments that had expired or have you had experience with having an infected and serious patient in your house so you had to remove bottles, needles, cannula? Have you considered binning all of this into rubbish bins, toilet or garbage depot?

The question of where shall medical waste be disposed during the period of Corona virus pandemics is emerging, due to the fact that producing of infectious medical waste has recently increased. Medical waste may cause yet another epidemic, if not managed and disposed properly and according to required recommendations.

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Proper treatment of medical waste is extremely important issue in order to provide safe preserving of general population health conditions. Consequently, the Institute of Public Health of Montenegro has, on its official web site, posted clear and precise recommendations, regarding how medical waste shall be properly managed and exposed. Recommendations also concern public institutions and domestic households, where there have been either unconfirmed or confirmed cases of Corona virus infected persons.

Recommendations clearly define that any personal waste, including general waste used by any infected person (personal protection gear, used cloths, items used for cleaning as well as personal waste of infected person) shall be disposed into plastic garbage bags with strip attached to it. This bag shall then have to be placed into another garbage bag, which again has to be tied with attached strip.

Wastage bag is then to be placed into a waste bin, but only after it had been stored for at least 72 hours.

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## STRICT CONTROL

A person collecting waste must wear disposable gloves, bearing in mind that she/he must not touch her/his face with hands because they may be contaminated during the waste handling. Outer gloves area is indeed considered contaminated. Thorough hands washing are recommended immediately after removing gloves from hands.

As far as patronage service is concerned, medical staff must, during the field visits of infected persons, take medical waste from previous visits and take it to a local Medical Center where infected persons normally go for medical examinations. This claim comes from the Ministry of Health official authorities.

However, according to general public experience, the reality proves rather different practice. Almost every single person we contacted had placed used bottles and needles into garbage bins before patronage service even appeared.

The same applied for medicaments that had expired; they either ended up in garbage bins of infected persons or they were flushed away in toilets.

Ministry of Health officials claim that disposing of medicaments that had expired should be done in special and designated recycling areas with bins that are specially designed for this kind of medical waste. However, the officials have not provided information about the exact locations of these areas and bins, including their numbers either.

According to information and data provided by the Ministry of Health officials, 146.044, 00 kilograms of medical waste has been produced in health institutions during the period of first five months in 2020. The officials have outlined that production of medical waste had not increased due to disposing of surgical or other associated interventions during the Corona virus epidemics.

A consortium of two companies, "Ekomedika" from Podgorica and "OMPeco" from Italy, is in charge with taking, collecting and processing medical waste in Montenegro. Consortium began to operate in 2013, based on permits issued by the Environmental *Protection Agency of Montenegro* (EPA Montenegro).

Two medical waste centers have been established in charge with medical waste processing at the state level. One of them is in Berane (local hospital premises) and the other one is nearby Clinical Center of Montenegro.

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## QUANTITIES

During the period of last 12 months, 32 public health institutions produced 396.748, 00 kilograms of medical waste and its processing costs were estimated to EUR 888.120, 00.

In 2018, 373.391 kilograms of medical waste were produced and its processing costs were estimated to EUR 835.836,00, while in 2017, 397.732, 00 kilograms of medical waste were produced costing the state of Montenegro some EUR 875.607, 00 for its processing.

On the other hand, the production of medical waste in 2016 was bigger than any of the above listed years; namely EUR 925.955 were spent for processing of nearly 1.4420.601 kilograms of medical waste.

| NAZIV<br>ZDRAVSTVENE<br>USTANOVE | 2016             |           | 2017             |           | 2018             |           | 2019             |           |
|----------------------------------|------------------|-----------|------------------|-----------|------------------|-----------|------------------|-----------|
|                                  | Količina<br>(kg) | Iznos (€) | Količina<br>(kg) | Iznos (€) | Količina<br>(kg) | Iznos (€) | Količina<br>(kg) | Iznos (€) |
| Dom zdravlja<br>Andrijevića      | 539,30           | 1.187,27  | 476,20           | 1.048,34  | 441,50           | 988,31    | 445,30           | 996,80    |
| Dom zdravlja Bar                 | 4.606,50         | 10.141,22 | 4.467,80         | 9.835,87  | 3.102,50         | 6.944,94  | 3.039,00         | 6.802,81  |
| Dom zdravlja Berane              | 1.528,40         | 3.364,77  | 1.478,40         | 3.254,70  | 1.548,80         | 3.467,00  | 1.524,80         | 3.413,26  |
| Dom zdravlja<br>Bijelo Polje     | 2.560,70         | 5.637,38  | 3.067,40         | 6.752,88  | 1.962,30         | 4.392,60  | 1.692,70         | 3.789,10  |
| Dom zdravlja Budva               | 5.792,65         | 12.752,53 | 5.999,99         | 13.209,01 | 7.115,80         | 15.928,71 | 7.178,20         | 16.068,40 |
| Dom zdravlja Cetinje             | 1.593,10         | 3.507,21  | 1.382,70         | 3.044,01  | 2.690,50         | 6.022,67  | 3.781,30         | 8.464,44  |
| Dom zdravlja<br>Danilovgrad      | 1.653,60         | 3.640,41  | 1.305,40         | 2.873,83  | 1.489,30         | 3.333,79  | 1.534,30         | 3.434,53  |
| Dom zdravlja Herceg<br>Novi      | 4.254,80         | 9.366,96  | 5.562,30         | 12.245,38 | 5.773,10         | 12.923,10 | 5.024,50         | 11.247,34 |
| Dom zdravlja Kolašin             | 773,50           | 1.702,86  | 691,90           | 1.523,20  | 693,00           | 1.551,29  | 793,10           | 1.775,33  |
| Dom zdravlja Kotor               | 2.587,33         | 5.696,01  | 3.074,38         | 6.768,25  | 2.326,70         | 5.208,31  | 2.451,30         | 5.487,24  |

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|                           |           |           |           |           |           |           |           |           |
|---------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| Dom zdravlja Mojkovac     | 1.622,90  | 3.572,83  | 926,80    | 2.040,35  | 838,20    | 1.876,41  | 1.024,60  | 2.293,56  |
| Dom zdravlja Nikšić       | 3.562,96  | 7.843,85  | 3.606,90  | 7.940,57  | 3.625,95  | 8.116,69  | 3.512,40  | 7.862,51  |
| Dom zdravlja Plav         | 1.631,00  | 3.590,65  | 1.662,00  | 3.658,90  | 1.286,50  | 2.879,83  | 1.119,60  | 2.506,24  |
| Dom zdravlja Pljevlja     | 1.829,30  | 4.027,18  | 1.668,70  | 3.673,64  | 1.351,40  | 3.025,10  | 1.452,50  | 3.251,42  |
| Dom zdravlja Podgorica    | 29.098,15 | 64.059,58 | 22.738,91 | 50.059,71 | 15.559,46 | 34.829,82 | 16.147,00 | 36.145,06 |
| Dom zdravlja Rožaje       | 2.965,40  | 6.528,34  | 2.346,10  | 5.164,96  | 2.034,50  | 4.554,24  | 2.210,20  | 4.947,53  |
| Dom zdravlja Tivat        | 1.527,64  | 3.363,09  | 1.530,10  | 3.368,51  | 1.761,60  | 3.943,35  | 1.934,70  | 4.330,83  |
| Dom zdravlja Ulcinj       | 1.721,60  | 3.790,10  | 1.897,10  | 4.176,48  | 2.264,80  | 5.069,76  | 2.178,90  | 4.877,48  |
| Zavod za HMP              | 5.412,61  | 11.915,86 | 4.988,50  | 10.982,18 | 4.541,22  | 10.165,51 | 4.498,00  | 10.068,77 |
| Zavod za transfuziju krvi | 3.975,70  | 8.752,50  | 4.249,20  | 9.354,61  | 4.568,50  | 10.226,59 | 4.804,70  | 10.755,33 |
| Opšta bolnica Bar         | 11.770,90 | 25.913,62 | 10.630,85 | 23.403,82 | 12.321,50 | 27.581,67 | 12.330,10 | 27.600,94 |
| Opšta bolnica Berane      | 33.833,00 | 74.483,36 | 36.389,70 | 80.111,93 | 38.554,80 | 86.304,92 | 40.610,60 | 90.906,83 |

|                            |                   |                   |                   |                   |                   |                   |                   |                   |
|----------------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| Opšta bolnica Bijelo Polje | 9.096,90          | 20.026,82         | 8.386,30          | 18.462,44         | 10.444,10         | 23.379,13         | 10.604,60         | 23.738,40         |
| Opšta bolnica Cetinje      | 4.573,00          | 10.067,46         | 5.001,40          | 11.010,56         | 5.710,70          | 12.783,39         | 5.256,10          | 11.765,80         |
| Opšta bolnica Kotor        | 9.134,85          | 20.110,38         | 8.621,80          | 18.980,91         | 8.746,70          | 19.579,48         | 9.563,40          | 21.407,66         |
| Opšta bolnica Nikšić       | 9.864,03          | 21.715,67         | 8.316,63          | 18.309,06         | 7.240,98          | 16.208,95         | 7.898,20          | 17.680,13         |
| Opšta bolnica Pljevlja     | 12.271,00         | 27.014,59         | 11.442,60         | 25.190,89         | 9.351,40          | 20.933,11         | 9.748,00          | 21.820,90         |
| Spec. Bolnica Brezovik     | 4.060,76          | 8.939,76          | 3.105,60          | 6.836,98          | 3.425,10          | 7.667,08          | 3.275,30          | 7.331,76          |
| Spec. Bolnica Dobrota      | 467,00            | 1.028,10          | 336,40            | 740,59            | 114,40            | 256,08            | 109,10            | 244,22            |
| Spec. Bolnica Risan        | 4.272,33          | 9.405,53          | 4.648,10          | 10.232,80         | 4.192,30          | 9.384,47          | 4.440,20          | 9.939,40          |
| Klinički centar Crne Gore  | 232.777,80        | 512.460,31        | 217.383,80        | 478.570,44        | 196.482,40        | 439.825,87        | 214.040,40        | 479.129,43        |
| Institut za javno zdravlje | 9.243,23          | 20.348,97         | 10.348,45         | 22.782,11         | 11.831,07         | 26.483,86         | 12.524,92         | 28.037,03         |
| <b>UKUPNO</b>              | <b>420.601,94</b> | <b>925.955,17</b> | <b>397.732,41</b> | <b>875.607,91</b> | <b>373.391,08</b> | <b>835.836,03</b> | <b>396.748,02</b> | <b>888.120,48</b> |

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Biggest producer of medical waste is Clinical center producing annually around 200.000, 00 to 230.000.00 kilograms of medical waste.

As far as private clinics are concerned, disposal of medical waste, according to claims by the Ministry of Health officials, has been conducted in identical ways as those applied by the state health institutions.

“Evidence of the processed medical waste quantity in private health institutions is recorded and analyzed by the Ministry of Health officials based on the information provided by the concessionary party. This quantity, regarding 2019, was 20.707 kilograms, which was approximately 1, 70 tons on monthly basis”, emphasized the officials at the Ministry of Health.

Ministry of Health has therefore, precise evidence regarding quantities of medical waste produced in public and state health and medical institutions. However, information from private clinics is provided indirectly from the concessionary party, namely “Ekomedika”.

The question is to what extent do private clinics follow required recommendations and rules, if we take into consideration the fact that the official and authorized Environmental Inspector had from 2016 till present, submitted and filed seven charges, initiating and demanding misdemeanor procedures directed against health institutions for mixing medical and municipal solid waste.

Six out of seven of these charges were related to private health institutions.

## **INSPECTION**

According to claims provided by the *Administration for Inspection Affairs*, the initiation of misdemeanor proceedings had taken place due to failure of conducting the orders provided by the Administration which again were relating directly to a contract signing with “Ekomedika”.

Additional controls only confirmed that the above mentioned subjects, after the submission of misdemeanor procedures directed against them, managed to remove discrepancies. Field analysis proved an improvement in both, public and state institutions, as well as in private medical institutions, in terms of conducting regular selection of wastage, including the appropriate packing of contents.

Also, an increased quantities handed over to “Ekomedika”, an authorized legal entity, were noted, stated the officials with the *Administration for Inspection Affairs*.

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*Administration for Inspection Affairs* officials reminded that local court judges have been those that make final decision, regarding the types and level of sanctions imposed, as well as on penalties and sentencing verdicts.

“Law on Waste Management defines that processing, that is, removing medical and veterinary waste can be implemented by either legal entity (company) or a contractor having appropriate equipment, including facility required for medical and veterinary waste processing, as well as required number of employees, based on permits regarding to processing or disposal of wastage. Book of regulations, conditions, methods and procedures of medical waste management, clearly define conditions, methods and procedures of medical waste management”, emphasized the *Administration for Inspection Affairs* officials.

Two conclusions may thus emerge according to the above mentioned issues; public and state medical and health institutions in most cases either apply legal and required procedures, or, inspection authorities fail to monitor and supervise the whole process in order to detect and register all discrepancies.

## **TYPES**

The following sharp items (being subject to processing in waste centers) include needles, cannula, lancets, razors, syringes, medical saws, needle connectors, insulin pens, insulin syringes and needles, chemo - dialysis needles, used and damaged ampoules and broken flacons). This kind of waste is designated with 18 01 01 Code.

Collecting and disposing infectious waste, designated with 18 01 03 Code, has been subdued to special requests due to infection prevention. These special requests do not relate to potentially infectious waste designated with 18 01 04 Code, which is also processed in waste centers. Potentially infectious wastes include clothes, cast/gypsum bandages, bed sheets, disposable clothes, medical calico and napkins/diapers, etc.

## **STORAGE AND PERSONEL/STAFF**

Ministry of Health explained that dangerous (hazardous) waste must be transported to temporary warehouse area.

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“Plastic bags with collected infectious waste, properly tied, sealed and marked, placed into plastic bins, shall be transported to temporary warehouse area, at least once a day and if possible, once during every shift”, Ministry of Health officials outlined.

Ministry of Health officials also outlined that temporary warehouse area is a place where medical waste is kept until it is handed over to a company authorized to accept and take away medical waste and consequently process it, pursuant to legal provisions.

“Temporary warehouse area should have adequate size in relation with medical waste quantity produced in such medical institution and in accordance with its frequent collection and transport. Space shall be easily accessed to all authorized staff in charge with waste management, having clear signs attached to space purpose, well illuminated with natural and artificial ventilation provided and finally, space has to be locked so no unauthorized persons can have access to this particular area”, Ministry of Health officials stated.

They add that “insignificant” number of incidents occurred with certain number of employees (staff) were injured whilst handling the waste.

The officials with the Ministry of Health explained that around 360 employees (staff) in health institutions went through the program of handling and managing medical waste which had been organized by the Ministry of Health and Institute of Public Health.

“According to the Law on Health and Safety Protection, the employees have been trained for safe work at their work places. They were provided with material and equipment required for personal and health and safety protection which allowed them to conduct regular special medical examinations. Number of incidents has been insignificant and there have been no records on infections caused by needle pricks, because all required epidemic recommendations and procedures, as far as the issues regarding all employees (staff) with health institutions have not been unknown”, claimed the officials with the Ministry of Health.

## **EMERGENCIES**

Ministry of Health officials claim that, for the time being, there is no need for opening of new centers for waste management.

Projection of required Centers for waste management has been based on estimated quantities of hazardous medical waste, based again on the information and data provided by the public health institutions and accepted evaluation methods in 2011.

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Ministry officials have, during the quantity estimate, taken into consideration, the expected tendency of growth of waste production derived as a result of economic growth and standard increase accordingly.

The selection of most appropriate technology, required for waste processing at local or state level has depended on types and waste quantity, including the distance between health institutions, transport possibilities, available space, legal regulations and management costs.

Ministry officials outlined that during the selection of required technology, they tended to prevent negative impact on public health and environment. They have particularly taken serious consideration, as far as surface – based and underground waters are concerned, including soil and air, trying thus to reduce the quantity of hazardous waste and accordingly provide safe waste handling inside and outside health institutions.

## **DROP IN CENTERS**

There are three Drop – In centers in Podgorica and their purpose is to provide safe work with intravenous drugs users, producing infectious medical waste because they allow the exchange of sterile equipment required for injecting.

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Ministry of Health officials pointed out that there is a potential danger from direct contact with infectious waste including HIV infection, B and C hepatitis, and gastroenterological, respiratory and skin infections as well.

Drop – In centers have been recognized as holders of medical waste and should, pursuant to the Law on Waste Management, keep records and evidence on quantities and waste types. In Montenegro there are three such centers for intravenous drugs users where the exchange of needles and syringes is feasible. Entire contaminated equipment for injecting collected in these centers (from the field and in centers too) is managed by Podgorica Center for waste managing, claim the Ministry of Health officials.

Officials of the Ministry of Health conclude that Drop – In centers, organize field work aimed to develop contacts with addicts that based on self – initiative do not make any contacts with any health or social institution in Montenegro.

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