



# COVID-19 Management

**290 Prof. Henrique Martins:**  
Digital Healthcare System - Now More  
than Ever

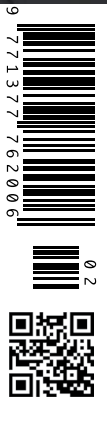
**302 Prof. Arch. Simona Agger Ganassi:**  
Towards Post-COVID-19: Lessons and  
Challenges for Hospitals and Healthcare  
Infrastructures

**310 Prof. Laura Oleaga:**  
How is the Pandemic Affecting Radiology  
Practice?

**324 Juhan Lepassaar:**  
Healthcare Cybersecurity in the Time of  
COVID-19

**326 Prof. Geraldine McGinty:**  
U.S. Radiology Responds to the Pandemic  
and Looks Ahead

**328 Alanna Shaikh:** Healthcare Has  
No Excuse for Another Pandemic Like  
COVID-19



# How COVID-19 Pandemic is Changing Waste Management

The COVID-19 crisis has seen an enormous increase in medical and hazardous waste generation. To protect human health and the environment, it is vital to ensure the safe handling and final disposal of such waste. A UN Environment Programme expert explains the dangers of inadequate medical waste management and outlines the most effective strategies for the future.

## Could you provide a brief overview of different medical waste dangers?

Healthcare waste is all the waste generated by health-care facilities, medical laboratories and biomedical research facilities, as well as waste from minor or scattered sources. Although hospitals produce the bulk of healthcare waste by volume, they are a small fraction of the total number of sources.

Healthcare waste can be categorised according to the following general classifications:

- Sharps waste
- Pathological waste
- Other infectious waste
- Pharmaceutical waste including cytotoxic waste
- Hazardous chemical waste
- Radioactive waste
- General (non-risk) waste.

Infectious waste is waste that is suspected to contain pathogens (disease-causing bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts.

Improper treatment and disposal of healthcare waste poses serious hazards of secondary disease transmission due to exposures to infectious agents among waste pickers, waste workers, health workers, patients, and the community in general to where waste is improperly disposed. Open burning and incineration without adequate pollution control exposes waste workers and the surrounding community to toxic contaminants in air emissions and ash.

## What would be the most dangerous categories of medical waste and how to manage those?

There is no universal answer to these questions. How dangerous a category of waste is, certainly depends on the

nature of the waste, but also very much on local vulnerability. Vulnerability, in turn, depends on exposure, sensitivity and adaptive capacity. The most dangerous waste might not be one that causes immediate, disastrous consequences to a few individuals, but rather one that systemically impacts millions of people, either directly or indirectly through ecosystems.

For example, medical waste contains a lot of plastic, which, if burned, releases known carcinogens into both the atmosphere and the remaining ash. Similarly, chemicals in medical waste, such as mercury (though its medical uses are being rapidly phased out globally thanks in part to the ratification of the Minamata Convention on Mercury), can bioaccumulate in the environment and impact humans through our food supply.

Waste management recommendations, including choice of technologies for destruction or decontamination, are also locally determined. Certain technologies, such as incineration, for example, may be effective when equipment is well maintained and used in the context of strict monitoring and legal oversight, but become a hazard risk if they are poorly maintained, or pushed beyond their design limits.

## Could you share any data about the changes in medical waste management caused by COVID-19?

There is not much quantitative and reliable data yet available. I certainly hope that such data are being kept at the institutional, municipal and national levels as they will be of enormous value as this pandemic continues, and in better preparing for future pandemics.

The most obvious qualitative change is a massive surge in used personal protective equipment, such as masks, not only in the well-regulated waste streams from medical facilities in developed countries, but in ordinary household

waste everywhere on the planet. Much of this equipment is not even properly collected and is right now almost certainly making its way into unmanaged dumpsites and the environment and being burned openly.

### Should there be compulsory segregation of waste in facilities treating COVID-19 cases?

In general, between 75% and 90% of the waste produced by healthcare facilities is non-risk (non-infectious, non-hazardous) general waste, comparable to domestic waste. Segregation is therefore an important element in efficient healthcare waste management. By separating hazardous from non-hazardous waste one can dramatically reduce the volume of waste that requires specialised treatment.

Other elements of healthcare waste management include waste classification, minimisation, containerisation, colour coding, labelling, signage, handling, transport,

operationalisable. Keep in mind that mail-back is not a disposal option, it is simply a way to shift the responsibility of disposal from users onto manufacturers. The disposal challenge will remain.

Looking beyond only medical waste, the general concept of 'extended producer responsibility' has been used in many countries, for many types of waste, in different ways, with varying levels of success.

### Will COVID-19 trigger new directions for UNEP?

Absolutely, it already has. The UNEP COVID-19 Response Building Blocks are still evolving, but they are likely to include the following:

- Block 1: Contribution to the medical and humanitarian emergency phase.
- Block 2: A transformational change for nature and people.

## How dangerous a category of waste is, certainly depends on the nature of the waste, but also very much on local vulnerability

storage, treatment and final disposal. And, of course, to maintain such a system requires continuous training, planning, budgeting, monitoring, evaluation, documentation and record-keeping.

### What alternative waste management methods could be recommended now for immediate implementation?

The best way to deal with immediate removal and destruction of COVID-19-related medical waste is to use existing, tried and tested, medical waste management systems. In the event such medical waste management systems are unavailable or overloaded, it is sometimes possible to use, with proper temporary operational adjustments to protect the health of professionals handling waste, existing municipal waste management facilities.

In this context, it is critical to recognise the essential role of waste workers and the continuity of the services they deliver, with relevant adaptations, during emergencies and disasters. One good source of specific information is the COVID-19 waste management recommendations from the [International Solid Waste Management Association](#).

### Is involving the manufacturers in medical waste management (eg through mail-back disposal options) a valid idea?

In the immediate phase of dealing with this pandemic it is unlikely that either an untested new technology or an untested new producer responsibility scheme will be

- Block 3: Building back better: greening the fiscal stimulus packages.

- Block 4: Modernising global environmental governance.

UNEP has also contributed to, and will continue to support environmental aspects of, the overall UN framework on a socioeconomic response to COVID-19.

### Is there any environmental impact of the current crisis medical waste-wise?

It is too early to know the nature or extent of environmental impacts. Some short-term impacts on the environment could be seen as positive ones – carbon emissions from fossil fuel burning could fall by 2.5 billion tons (about 5%) this year, which would constitute the largest drop in demand for fossil fuels ever. Air quality has also improved dramatically in many places.

I am sure that longer-term impacts, and the specific impacts of COVID-19-related medical waste on the environment, together with the economies and societies that depend on it, will be the subject of many interesting PhD theses in coming years.

### What recommendations can you give to countries and healthcare facilities to optimise strategic preparation for future outbreaks?

My first recommendation is to remind everyone that the current pandemic is ongoing, and may well be for quite a long time. Therefore, in addition to any immediate, urgent measures that may be taken, it will be necessary

to continuously adapt, optimise and prepare, not only for future outbreaks, but for the ongoing development of this one.

For medical institutions or governments that do not have adequate medical waste management plans and practices in place, our [UNEP compendium](#) of technologies for medical waste may be useful, if implemented over a timescale of months, to help decide on a path forward. The compendium provides a robust methodology for analysing local health-care waste generation, composition and disposal needs, and selecting appropriate technologies as part of a local waste management system.

The process of institutionalisation of a good healthcare waste management system is complex. It entails a waste assessment and evaluation of existing practices, evaluation of waste management options, development of a waste

management plan, promulgation of institutional policies and guidelines, establishment of a waste management organisation, allocation of human and financial resources, implementation of plans according to set timelines, as well as a programme of periodic training, monitoring, evaluation and continuous improvement. Countries, cities and institutions that have already done all this and developed an operating waste management system, including disaster contingency planning, are far better able to cope with surges in medical waste associated with disasters, including the ongoing pandemic. ■

 **Author: Keith Alverson**

Director, UNEP International Environmental Technology Centre | Osaka | Japan

[keith.alverson@un.org](mailto:keith.alverson@un.org) | [unenvironment.org/ietc](http://unenvironment.org/ietc)

[@AlversonKeith](https://twitter.com/AlversonKeith) | [in @keithalverson](https://www.linkedin.com/company/keithalverson)



HealthManagement.org

Follow us on LinkedIn

<https://iii.hm/linkedin>



**HealthManagement.org**

Promoting Management and Leadership