

JAPAN SOCIETY OF MATERIAL CYCLES AND WASTE MANAGEMENT

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Tackling Plastic Issues

In November (2019), the 8th Chemical Sciences and Society Summit (CS3) meeting was held in London, just before the outbreak of COVID-19 started. I had the great opportunity to participate in the 8th CS3 and share our perspectives as one of the panelists. The CS3 brings together leading experts to discuss how chemical science can help address some of the most difficult challenges facing our world. Previous CS3 meetings have tackled a variety of topics such as water resources, human health, and sustainability.



At the 8th CS3 meeting, scientists from four participating countries (the UK, Germany, China, and Japan) gathered to focus and discuss four topics related to “sustainable plastics”: 1) their impact on the environment, 2) new sustainable plastics, 3) the recyclability of plastics, and 4) the degradation of plastics. This was a symbolic meeting in which the chemical societies of each country began to seriously confront the plastic life cycle.

In the same way that plastics are used in many different ways, it is also clear that a combination of materials will be needed to accommodate myriad applications. At the same time, this means that there is no single solution

suitable for every scenario, region, or product. Different countries have already adopted a wide range of waste management practices, with varying degrees of environmental impact. As such, sustainable options in a particular location or region are not necessarily global solutions that fit all regions.

One of the options may be the use of sustainable polymer based products the development of polymers that are fully constructed from renewable, biologically-derived source chemicals. This development also includes the construction of raw materials used in the production of polymers from CO₂ as carbon neutrals and bio-waste.

Another option may be the application of durable or long-lasting polymer synthesis that can be reused multiple times for efficient recycling. Thus, other scenarios require the design of polymers that incorporate special chemical and physical capabilities to make them "degradable on demand."

We, Japan Society of Material Cycles and Waste Management (JSMCWM), recognize that building a wise approach to plastics requires cooperation between all disciplines, businesses, policies, and human behavior. Technology alone cannot solve all problems. Providing infrastructure and ecosystems for the future of sustainable plastics requires parallel advances in waste management, regulation, economics, and behavior.

We have a philosophy that plastics must not be intentionally released or dumped into the environment, which is essential for the technological advancement of efficient closed-loop waste management systems and the solution of plastic problems. Responding to technical challenges requires close collaboration with a variety of other technical and industrial disciplines and should be done in parallel with a wider range of considerations.

Waste research on COVID-19 shows that major shift in the life cycle has begun and the amount of waste is increasing. At present, we are at a major turning point to seriously address not only the problem of marine debris

but also the problem of COVID-19 plastic waste through plastic waste and climate change countermeasures. As the life cycle changes drastically, it is necessary to consider how to relate to plastics from a global perspective through the carbon cycle.

T. Yoshioka (Tohoku University)

Response Policy to COVID-19 in Waste Management

1. Introduction

In Japan, the novel coronavirus infectious disease (COVID-19) spread after the first patient was confirmed on January 15, 2020 and, on April 7, the government declared a state of emergency under Article 32, Paragraph 1 of the Act on Special Countermeasures for Pandemic Influenza and New Infectious Diseases Preparedness and Response, requesting that people refrain from going out and from economic activities. The state of emergency was lifted nationwide on May 25, but measures are still required to prepare for another spread of the infection.

Waste management is indispensable social infrastructure that sustains people's daily lives and supports the economy in Japan. Furthermore, the operation of waste management is regarded as indispensable for ensuring the stability of people's lives and the national economy in the "Basic Policies for Novel Coronavirus Disease Control" (set on March 28 by the government's Novel Coronavirus Response Headquarters and revised on May 25) and it continues to be required even under a declaration of a state of emergency.

In order to continue the operation of the waste management, the Ministry of the Environment (MOE) has taken necessary measures on COVID-19 so that waste management can be carried out properly and smoothly. This article introduces these measures and efforts made by the MOE so far.

2. Background of the Response Policy for the Proper Treatment of Infectious Waste Related to the COVID-19

Waste related to the COVID-19 consists of infectious waste discharged from medical institutions and facilities such as hospitals and noninfectious waste discharged from non-medical facilities (households and temporary lodging facilities where patients are staying). Infection of COVID-19 generally takes places via respiratory

droplets (including micro-droplet infection) which are inhaled, or via direct/indirect contacts with other people in a way similar to novel influenza viruses. Therefore, it is possible to prevent infection in the treatment of each kind of waste by taking appropriate measures such as those described later in this article.

Infectious waste discharged from medical institutions, etc. can be treated safely in accordance with the "Infectious Waste Treatment Manual under the Waste Management and Public Cleansing Act", which explains waste treatment standards and their contents based on the Act. Accordingly, on January 22, 2020, the Director of the Environmental Regeneration and Material Cycles Bureau issued a notification to ensure the proper treatment of infectious waste in accordance with the manual and informed stakeholders of it.

Noninfectious waste related to COVID-19, which is discharged from non-medical facilities, can be treated appropriately under the infection prevention measures necessary in accordance with the "Guideline on Measures Against COVID-19 in Waste Treatment". By implementing these measures, it is possible to prevent contact with viruses and prevent infections originating in waste treatment. A notification by the Director of the Environmental Regeneration and Material Cycles Bureau dated January 30 made public the implementation of treatment in accordance with this guideline.

3. Guideline on Measures Against COVID-19 in Waste Treatment and Management

In addition, the "Guideline on Measures Against COVID-19 in Waste Treatment and Management" was published on September 7, 2020. This guideline covers not only waste treatment companies but also relevant parties such as waste generators and local governments, summarizes measures to prevent infection at the time of discharge, and measures to be taken for proper treatment and for the maintenance of the waste management system. An outline of the guideline is introduced in the next section.

4. Outline of the Guideline

4.1 Preface: Basic Information on COVID-19

4.1.1 General Information on COVID-19

- According to the WHO, the incubation period for COVID-19 is one to 14 days (generally five to six days). The Ministry of Health, Labor and Welfare requires a person who has been in close contact with an infected person to monitor his or her health

condition for 14 days.

- Infection with COVID-19 causes fever, cough, respiratory symptoms such as runny nose and breathing difficulties, headache, and fatigue.

COVID-19 Infection Routes

< Droplet Infection > The virus is released along with droplets from the person infected (sneezing, coughing, saliva, etc.), and another person inhales the virus through the mouth or nose and becomes infected.

< Transmission by Contact > If a person infected touches a surrounding object after covering a sneeze or cough with his or her hands, the virus adheres to the surrounding object. When others touch the object, the virus adheres to their hands, and when they touch their mouths or noses, it infects them through the mucus membranes.

< Micro-Droplet Infection > Particles of less than 5 µm, which are fine droplets, float in the air in closed rooms with poor ventilation. A person is infected by inhaling small particles of saliva that are released during a conversation that takes place at a short distance or for a long time.

General Infection Prevention/Infection Spread Prevention Measures (Examples)

Avoid the following “Three Cs”.

- 1) Closed spaces with insufficient ventilation
- 2) Crowded conditions with people
- 3) Conversations at short distances

- Wear a mask when you go out, and try to cover

your mouth when you cough.

- Wash your hands with soap and disinfect your hands with alcohol.
- Get sufficient nutrition and sleep, and perform health management such as regular temperature measurement.

4.1.2 Facts About COVID-19 and Response Policy

- The state of emergency was announced on April 7, requesting that people refrain from going out and from economic activity, but was lifted on May 25.
- Since the state of emergency was lifted, a “new lifestyle” has become necessary to prevent the spread of infection, as has the implementation of measures such as guidelines established for each industry.
- In the basic policy, the operation of waste management is indispensable for ensuring the stability of people's daily lives and of the national economy. All waste management companies are required to continue operations even when a state of emergency is declared.

4.2 Main Section: Measures Against COVID-19 in Waste Treatment and Management

4.2.1 Points to Note Regarding Waste Treatment Related to COVID-19

1) Types and characteristics of waste related to COVID-19

Place of Generation	Main Types of Waste (Specific Examples) [Waste Classification]	Features
(1) Homes and business offices (excluding (2) medical institutions, etc. and (3) temporary lodging facilities)	Waste from daily life (masks and tissues with respiratory secretions (nasal mucus, sputum, etc.) generated by people infected with COVID-19, disposable tableware used for meals, diapers with excrement, urine, etc.) [Municipal waste/industrial waste]	<ul style="list-style-type: none"> • Homes and offices do not fall within facilities from which infectious waste is discharged as prescribed in the Waste Management and Public Cleansing Act. • Generated and increases as infection spreads. (In addition, ordinary waste other than that listed in the column to the left tends to increase in homes and decrease at offices due to people exercising self-restraint in going out due to the spread of infection.)
(2) Medical institutions, etc.	Medical equipment (injection needles, scalpels, glass scraps, etc.) used for COVID-19 diagnosis, treatment, and examination, disposable products (tweezers, syringes, catheters, infusion sets, gloves, etc.), sanitary materials (gauze, cotton wool, etc.), paper diapers, excreta, etc. [Municipal waste/industrial waste/ infectious municipal waste/infectious industrial waste]	<ul style="list-style-type: none"> • Whether or not waste is infectious is determined based on the criteria indicated in the “Infectious Waste Treatment Manual Based on the Waste Management and Public Cleansing Act”. • Treatment for inpatients generates more waste than that for outpatients. • Among inpatients, the amount of waste discharged due to the treatment of severely ill patients is large.

(3) Temporary lodging facilities	Masks and tissues with respiratory secretions (nasal mucus, sputum, etc.), paper diapers, human waste of overnight caregivers, and personal protective equipment such as masks and gloves used by facility operators [General waste/industrial waste]	Since temporary lodging facilities are not places where doctors carry out medical treatment, they do not fall within facilities from which infectious waste is discharged as prescribed in the Waste Management and Public Cleansing Act.
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2) Points to Note in Discharging Waste

(1) Homes and business offices (excluding (2) medical institutions and (3) temporary lodging facilities)

- Do not touch waste directly; dispose of garbage before garbage bags become full and securely tie them; and wash hands with soap immediately after disposal.
- If waste touches the outside of a garbage bag, there is an opening/a gap in the bag when it is tied, and/or the bag is torn, double bagging is effective.
- Regarding resources that are normally reused and recycled, it is conceivable to consider the following measures and make them known to residents and waste management companies as necessary.
 - Discharging PET bottles, paper containers and packaging, plastic containers and packaging, etc. “combustible waste (burnable waste)”.
 - -Discharging non-combustible materials such as cans and bottles after about one week has passed or, if that is difficult, discharging them by putting them in the “combustible waste (burnable waste)”, after this the waste must not be sorted for further treatment.
 - For linen that is not contaminated with bodily fluids, wearing gloves and a mask while handling, washing the linen with a common detergent, and then drying it completely. Not throwing away reusable linen unnecessarily.

(2) Medical institutions, etc.

- Install a partition in order to prevent infectious waste from being mixed with other waste.
- Put perishable waste in a refrigerator or freezer.

- Indicate that the waste is infectious.
- Select an appropriate container according to the type and property of waste, put the waste in the container, and then seal the waste in the container.
- By treating waste in accordance with the treatment standards of the Waste Management and Public Cleansing Act, it is possible to prevent people from coming into contact with viruses and infection due to waste treatment. Thus, unless there is a special reason, it is not necessary to discharge infectious waste related to COVID-19 separately from other infectious waste.

(3) Temporary lodging facilities

Temporary lodging facilities are not places where doctors carry out medical treatment. They do not fall within facilities from which infectious waste is discharged as prescribed in the Waste Management and Public Cleansing Act. However, the following are the points to note in discharging waste.

- Do not touch waste directly; dispose of garbage before garbage bags become full and securely tie them; and wash hands with soap immediately after disposal.
 - If waste touches the outside of a garbage bag, there is an opening/a gap in the bag when it is tied, and/or the bag is torn, double bagging is effective.
 - For linen, which was used by a person infected with COVID-19 or a person who is suspected to be infected, wearing gloves and a mask while handling, washing the linen with a common detergent, and then drying it completely. Not throwing away reusable linen unnecessarily.

3) Points to Note in Waste Treatment

	Infectious Disease Control Measures (Examples)
(1) Common measures for waste treatment and office work	<ul style="list-style-type: none"> • Practice a new lifestyle that includes three basics for preventing infection (securing physical distance, wearing a mask, and washing hands) • Pay attention to health maintenance by getting sufficient rest, maintaining regularity in daily life, and through the regular measurement of body temperature. • Avoid commuting rush hours (staggered work start times, bicycle commuting, working from home, etc.) and wear a mask when commuting. • Make employees considered to be in close contact with family members who have tested positive stay home. • Thoroughly disinfect shared items, avoid going out to crowded or downtown areas when it is not necessary or urgent, wash hands and gargle when returning home.
(2) Measures for waste treatment work	<ul style="list-style-type: none"> • Use gloves, masks, and other personal protective equipment, and wear work clothes with less skin exposure (long sleeves and pants) when working in contact with waste. (*Be careful of heat stroke in the summer season) • Wash and disinfect hands immediately after waste treatment work every time. • Clean those parts of waste transportation vehicles and related facilities where hands or protective equipment such as gloves touch. • When taking breaks, changing clothes, or traveling by vehicle, avoid the “Three Cs”, ventilating and refraining from conversations at short distances without wearing a mask. • Do not touch the outer surface of gloves or other surfaces with bare hands when removing personal protective equipment. • Turn clothes inside out when undressing, and put personal protective equipment in a bag and store it when not wearing it so that the virus does not adhere to it. • Pay attention to the order of each of these actions.
(3) Measures for office work	<ul style="list-style-type: none"> • Work from home to the greatest extent possible, and clean and disinfect the office regularly. • Restrict visitor access, get visitors’ names, and be able to contact them as needed. • Measure visitors’ body temperatures before they enter the room, and if anyone has a fever, prohibit entry. • For customer service and counter operations, both employees and visitors wear masks, wash their hands, and disinfect their hands. • In the office, secure interpersonal distance and install partitions such as those made of plastic. • For business trips and meetings, use conference calls and video conferencing. • If taking a business trip is unavoidable, make a record of those met with at the trip destination and the travel route.

4.2.2 Possible Risks Associated with COVID-19 and Measures to Be Taken by Each Entity Possible Risks Associated with COVID-19

When an outbreak of COVID-19 spreads, the following risks are assumed regarding the proper treatment of waste.

- Lack of the capacity of collection/transportation and treatment facilities for infectious waste due to the increased generation of infectious waste
- Lack of the capacity of infectious waste collection/transportation and treatment facilities due to treating non-infectious waste as infectious waste
- Lack of the capacity of waste

collection/transportation and treatment facilities due to an increase in the amount of household waste generated due to people exercising self-restraint in going out.

- Service struggles and a lack of waste management due to changes in recycling market conditions and sorting methods
- Service struggles and a lack of waste management due to the suspension of waste management due to a shortage of protective equipment
- Service struggles and a lack of waste management due to the suspension of waste management due to the infection of workers

- Delays in consignment/permit administrative procedures due to the infection of prefectural and municipal staff
- Service struggles and a lack of waste management due to the suspension of waste management due to the deterioration of operations at waste management companies

Measures to Be Taken by Each Entity

1) Measures to be taken by waste dischargers

- For waste from homes and business offices, do not touch the waste directly, deflate the garbage bag and tie it tightly, and discharge the waste.
- For infectious waste from medical institutions, etc, discharge it in accordance with the treatment standards of the Waste Management and Public Cleansing Act in the same way as when handling ordinary infectious waste.

※ For details, see 4.2.1. 2) Points to Note in Discharging Waste

2) Measures to be taken by waste management companies, etc.

- (1) Formulation of a business continuity plan (formulation of (2) to (5) below together)
- (2) Establishment of a system for measures against COVID-19
- (3) Evaluation of infection risk and examination of infection prevention measures according to the results of the evaluation
- (4) Securing important factors (personnel, supplies, etc.) for business continuity
- (5) Examination of measures when there is a shortage of important resources (personnel, supplies, etc.) for business continuity
- (6) If employees are infected with COVID-19 or if infections are spreading in Japan, act according to the business continuity plan that has been formulated.
- (7) Education and training for employees.
- (8) Regular inspection and revision of the business continuity plan

3) Measures to be taken by municipalities

- (1) Dissemination of the contents of relevant notifications, office communications, manuals, Q & A, leaflets, etc. issued by the government to relevant parties such as waste management companies and dischargers.
- (2) Thoroughness of overall responsibility for

- treatment of for municipal solid waste
- Based on 2) (2) to (5), the formulation of a business continuity plan for waste management in cooperation with a general waste management company.
 - Action in accordance with the business continuity plan when infection spreads (6).
 - Education and training for government officials and staff (7)
 - Regular inspection and revision of the business continuity plan (8).

Additional measures when COVID-19 spreads

- Confirmation of the situation of the stockpile of personal protective equipment and other equipment in municipalities and at municipal waste management companies and securing the number required.
- Comprehensive consideration of whether waste treatment is possible within the jurisdiction, and consideration of making a request for support from other municipalities and requesting that prefectures make adjustments for treatment at facilities in other municipalities, as necessary.
- If necessary, consideration of utilizing special cases in which the proper waste management company will be allowed to treat the waste without a municipal waste management business permit.
- In case of an application for the renewal of a permit, the utilization of a provision for permits to remain in effect even after the expiration of the period of validity of the previous permit until it is disposed of by the administrative agency
- The use of mail or e-mail is recommended for the permission renewal application procedure.

4) Measures to be taken by prefectures (including government-designated cities for industrial waste)

- (1) Dissemination of the contents of relevant notifications, office communications, manuals, Q & A, leaflets, etc. issued by the government to municipalities in the jurisdiction, waste management companies, and dischargers.
- (2) Promotion of proper and smooth municipal solid waste management
 - Establish a coordination and cooperation system with municipalities in the jurisdiction, affiliate organizations, temporary lodging facilities, surrounding prefectures, and the national government.
 - Collect information such as on the municipal solid waste treatment system, the situation

regarding the possession of masks and protective clothing by municipalities and affiliate companies, and the amount of waste discharged, and examine the possibility of service struggles or delays in treatment and a lack of or shutdown of treatment facilities.

- Remind municipalities in the jurisdiction that it is necessary to formulate a business continuity plan for waste management.
- If infection spreads at a cleaning office, treatment facility, or municipal solid waste management company in a municipality, request support from other municipalities in the prefecture as necessary, and carry out coordination, consultation, and support in order to treat waste in other municipalities in the prefecture. Furthermore, if support and treatment across prefectures is required, carry out cooperation and coordination between prefectures.

(3) Promotion of proper and smooth industrial waste management

- Establish a coordination and cooperation system with industrial waste management companies in the jurisdiction, industrial waste-related organizations, medical institutions and related organizations, temporary lodging facilities, government-designated cities under the Waste Management and Public Cleaning Act, surrounding prefectures, and relevant national government agencies.
- Collect information such as on the treatment situation of industrial waste management companies in the jurisdiction, the situation regarding the possession of masks and protective clothing, and the amount of waste generated, and examine the possibility of service struggles or delays in treatment and a lack of or shutdown of treatment facilities.
- If it becomes necessary for a waste discharger to search for a new industrial waste management company due to service struggles or delays of treatment operations, or other issues, provide a list of industrial waste management companies.
- Raise the upper limit of the storage amount for disposal, and consider temporary storage on land owned by prefectures.
- If the existing industrial waste management company cannot treat the waste properly and smoothly for unavoidable reasons, consider the utilization of a special case in which the proper waste management company will be allowed to treat the waste without a waste management business permit.

- Actively consider requesting industrial waste management, which is entrusted to the administration office of the municipality under its jurisdiction.
- Actively coordinate between prefectures when implementing wide-area treatment.
- If wide-area treatment is required due to the spread of infection, implement measures such as exemptions from delivering restrictions.
- In case of an application for the renewal of a permit, utilize the provision that permits remain in effect even after the expiration of the period of validity of the previous permit until it is disposed of by the administrative agency.
- Recommend the use of mail or e-mail for the permission renewal application procedure.
- Inform waste management companies in the jurisdiction that it is necessary to formulate a business continuity plan for waste disposal.

5. Dissemination of Information

In addition to the guidelines, Q & A (English translation available), leaflets (some with English translation available), and videos are also provided on the MOE website in an easy-to-understand manner regarding the content of infection prevention measures for each entity.

6. Future Action

Since scientific knowledge of COVID-19 is not always sufficient, the MOE continues to collect, investigate, and organize the latest information, and disseminate accurate and useful knowledge in an easy-to-understand manner to relevant parties such as waste treatment companies, waste dischargers, and local governments to promote awareness. Furthermore, the MOE ensures the proper treatment of waste related to COVID-19 and the maintenance of a waste management system by striving to understand the actual on-site conditions and issues related to waste treatment, supporting the securing of materials necessary for business continuity and conducting the necessary reviews of systems and operations.

(Ayuko Kobayakawa, Waste Management Division Environmental Regeneration and Material Cycles Bureau, Ministry of the Environment)

**Guideline on Measures Against COVID-19 in
the Waste Management Industry – for Proper
Caution and Acting Appropriately “with
Corona”**

1. Introduction

In order to deal with the spread of COVID-19, which has become an unprecedented national crisis, the government of Japan established the Novel Coronavirus Response Headquarters on March 28, 2020 and decided on the “Basic Policies for Novel Coronavirus Disease Control” (hereinafter referred to as the “Basic Policies”¹⁾). Based on the Basic Policies, the people of Japan, including the government, local authorities, medical personnel, experts, and business operators, have united and taken measures against COVID-19. Under the Basic Policies, waste management companies (collection, transport, and disposal) and other businesses involved in waste management are designated as “business operators that perform essential operations for ensuring the stability of national life and the national economy”, and are required to continue operations while taking sufficient measures to control infection.

In addition, in the revised version of the Basic Policies of May 4, 2020, it was requested that “business operators and affiliates create their own guidelines for each type of industry and facility and proceed with voluntary efforts to control infection, referring to the recommendations made by the Novel Coronavirus Expert Meeting on May 4th”.

In response to this request, the Japan Environmental Sanitation Center and Japan Industrial Waste Information Center jointly formulated this guideline for the waste management industry with support from the Ministry of the Environment (MOE). The guideline was developed based on notifications and administrative circulars as well as the contents of a Q&A hitherto issued and released by the MOE.

The guideline mainly consists of “basic information on COVID-19” and “infection prevention measures in waste management”. This article explains the content of the latter, and represents an opportunity to publicize and disseminate its main elements and points to consider.

2. Waste Types and Categories

When COVID-19 occurs, the generated medical materials and equipment waste, used mainly by medical and testing facilities for the diagnosis, treatment and

testing of the disease, are discharged as infectious waste.

In addition, households and offices with people who have contracted COVID-19, as well as temporary lodging facilities which are accommodation facilities for the recuperation of infected people with mild symptoms,* generate waste of tissues and used masks with respiratory secretions (nasal mucus, sputum, etc.). Not only tissues but also masks, if they are made of cloth such as gauze, constitute “general waste” by law, even if they are business-type waste generated from offices or temporary lodging facilities. However, non-woven masks are made from synthetic fibers such as polyester or polypropylene, and when these masks are generated as waste from offices or temporary lodging facilities, they are classified by law as waste plastic and constitute “industrial waste”.

Nonetheless, in the case of masks, infectious pathogens may adhere to them and there is no way to separate and recycle this waste. Therefore it is considered appropriate that as a whole masks are collected and incinerated as “general waste” from the perspective of suitable treatment, as in the “Guideline on Measures against Novel Influenza for Waste Treatment”⁷⁾, which recommends that masks “be treated as general waste under the responsibility of municipalities”.

*Temporary lodging facilities are facilities where those with mild cases of COVID-19 are accommodated and recuperate. Unlike hospitals and clinics, they are not places where doctors carry out medical treatment, and the generated waste is therefore not classified as infectious waste.

3. Measures to Be Taken for Conducting Waste Treatment

Since the common infection routes for COVID-19 are droplet infection and contact infection, the same as for novel influenza viruses, it is judged that the same methods of waste management related to regular influenza may be used for waste management related to COVID-19.

In addition, it is clear that the “Three Cs” — closed spaces, crowded places and close-contact settings — are important risk factors for COVID-19 infection, and that droplet infection is caused by the saliva (micro-droplets) produced by conversation and speech. Thus, conversation during breaks and meals carries the risk of infection with this disease. Infection cannot occur just by touching an object contaminated with the virus, but can occur by touching mucus membranes such as those of the eyes, mouth, or nose with a contaminated finger or hand. On this point, it is necessary to reaffirm the

necessity of regular hand washing.

Considering these characteristics of infection with COVID-19, the guideline concludes that the infection of workers can be prevented by the following measures, in which they perform collection, transport, and disposal without coming into contact with COVID-19. Since the common infection routes for COVID-19 are droplet infection and contact infection, the same as for novel influenza viruses, it is judged that the same methods of waste management related to regular influenza may be used for waste management related to COVID-19.

3.1 Development of Corporate System

Top corporate management should take the initiative and establish a system for the formulation and modification of measures to control COVID-19 in the workplace. When doing so, it is necessary to 1) comply with relevant legislation such as the Infectious Disease Law and the Act on Special Measures for Pandemic Influenza and New Infectious Diseases Preparedness and Response; 2) utilize health committees and industrial health staff such as industrial physicians based on industrial safety and health laws; and 3) establish a system that constantly collects accurate information on COVID-19 from national and local governments and related organizations.

In addition, among the matters described in this guideline, it is necessary to 1) consider methods for sharing collected information that should be understood by employees, customers, and others (for example, by notification at morning gatherings of employees, posting notices within the facility, or by e-mail); and 2) establish communication channels in advance with concerned parties inside and outside the company as preparation for a case in which an employee is infected.

3.2 Measures When Collecting and Transporting Waste

Points to be considered for preventing infection based on the characteristics of COVID-19 are described as follows, following the workflow for waste treatment in chronological order, i.e., before, during, and after work.

Through all stages, attention should be paid to droplet infection and contact infection, and to measures against these, including coughing etiquette, hand-washing and disinfection, and avoiding closed spaces, crowded places, and close-contact settings to protect against micro-droplets scattered by people speaking. It is worth noting that the virus does not cause infection merely by adhering to the skin, but it does cause infection by

touching the mucus membranes of the eyes, nose or mouth with the hand after the virus has adhered to fingers.

[Before Work]

When changing into work clothes, keep a sufficient distance from other people, and open the windows or doors of the changing room in order to ventilate it as often as possible.

In addition, to prevent the virus from adhering to mucus membranes during work, wear personal protective equipment such as gloves, goggles (or face shields or safety glasses), and masks, along with work clothes that have long sleeves and long pants.

[During Work]

If touching objects to which the virus may be adhering, such as a places that several other people may have touched between work operations, waste, or the outer surfaces of personal protective equipment, then the virus may also adhere to the surface of gloves or hands. Thus, care must be taken not to touch the mucus membranes of the face, such as the eyes, nose, or mouth, without washing or disinfecting hands.

In addition, it is necessary to take the same care regarding objects on which the virus is not normally expected to adhere, such as mobile phones, smartphones, and tablets.

It is also necessary to open the windows of vehicles used for transporting and hauling waste, in order to keep them constantly ventilated. Naturally, if there is more than one person in the vehicle, then masks should be worn without fail.

If there is a risk of heatstroke, it is important to take frequent breaks and drinks for rehydration, but when doing so, remove gloves, wash/disinfect hands, and disinfect the gloves. When wearing a mask in high temperatures or humidity, it is necessary to 1) remove it when outside and a sufficient distance between people (2 m or more) can be secured, 2) avoid heavy work, and 3) take a break by removing the mask with proper frequency, ensuring sufficient distance from the people around. (FY2020 “Action to Prevent Heatstroke”, Ministry of the Environment, Ministry of Health, Labor and Welfare).⁸⁾

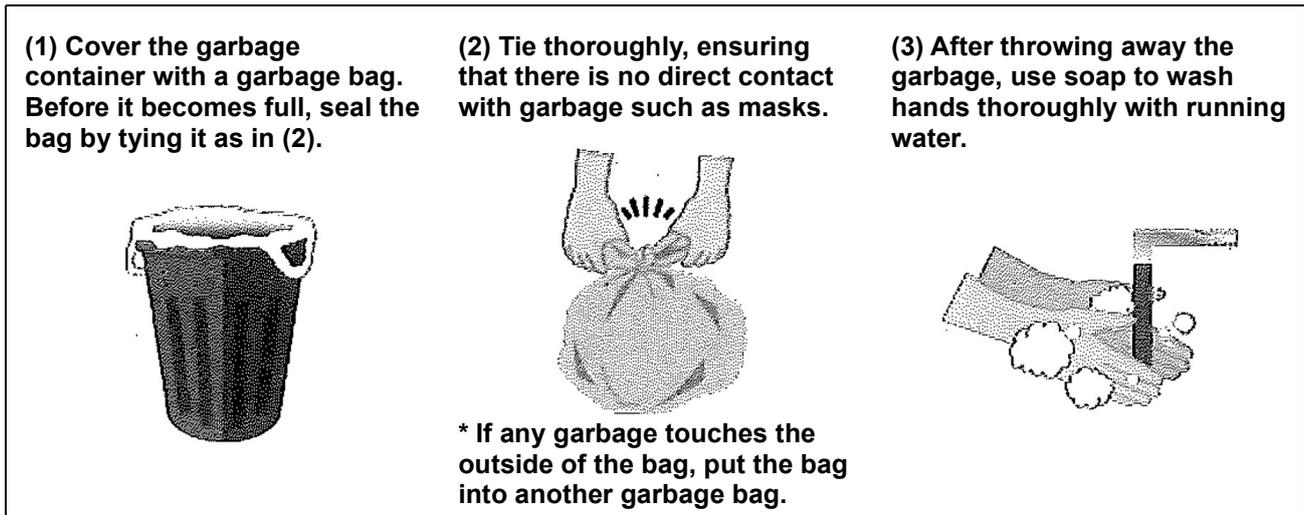


Figure 1: How to throw away masks and other equipment or materials used by people who have, or are suspected of having, an infectious disease such as COVID-19 (Ministry of the Environment)

[After Work]

The following items should be disinfected with alcohol: 1) work vehicles, including their interior areas around the driver's seat, particularly the steering wheel, seat, seatbelt, and door handle; 2) used personal protective equipment that will be used repeatedly; and 3) mobile phones, smartphones or tablets that have been carried around. As disinfectant, it is appropriate to use 0.05% sodium hypochlorite or 70% concentration alcohol³⁾ ⁹⁾.

After returning from work and disinfecting work vehicles, etc., wash and disinfect hands.

Finally, when taking off work clothes and removing personal protective equipment, turn them inside out. It is necessary to wash/disinfect hands before removing personal protective equipment worn on the face, such as masks. After removing personal protective equipment, disinfect hands again before touching faces or other areas where the virus is not expected to be present. In addition, wash faces if necessary.

As with “before work”, when changing clothes or showering, keep a sufficient distance from other people, and do not forget to provide ventilation as frequently as possible by opening the windows and doors of the changing room.

3.3 Measures When Treating Waste

Similar to the measures described above for the collection and transport of waste, the guideline indicates key points for preventing infection based on the characteristics of COVID-19 in chronological order, following workflow — i.e., before, during, and after

work. Common points remain unchanged when measures for preventing heatstroke are added to these measures to be taken when collecting and transporting waste.

This section will focus on the points to consider “during work” in waste treatment facilities.

[During Work]

Independent of the type or scale of waste treatment facility, a common requirement is to keep windows or doors open in operating rooms for equipment, apparatuses, and machines, in operation control rooms, and in central control rooms, so as to maintain constant ventilation. If several people work in the same room, then they should be sure to wear masks. These measures should be thoroughly observed and, depending on the situation within the facility, the Three C’s should be avoided.

3.4 Other Precautions

When taking breaks, maintain a sufficient distance from other people, and refrain from talking at close distance. If taking a break inside a vehicle or facility (indoors), open windows or doors for ventilation.

If there is an outdoor smoking area or indoor smoking room, then people may have to come within close distance of each other, so please refrain from conversation and from making calls on smartphones or other mobile phones.

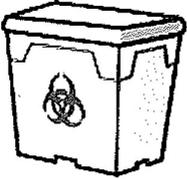
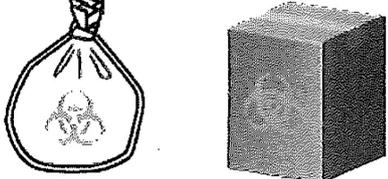
(1) Sharp objects such as hypodermic needles and scalpels	(2) Liquid, such as blood, or sludgy substances	(3) <u>Non-reusable objects, such as gauze, with blood, etc., adhering to them</u>
<u>Penetration resistant</u> robust container	Non-leaking <u>closed container</u>	Sturdy double plastic bag, or robust container
 <p data-bbox="384 658 671 685">Example: Plastic container</p>		 <p data-bbox="932 658 1369 712">Example: Plastic bag (double)/cardboard container (with bag inside)</p>

Figure 2: Examples of infectious waste containers, depending on the type and characteristics of the infectious waste (Ministry of the Environment)

4. Measures for Treatment of Waste generated from Specific Sources

4.1 Households with Persons Infected

Households with a person infected with COVID-19 generate, as household garbage, waste with respiratory secretions adhering to it, such as masks and tissues used by the person infected. In cooperation with the relevant government offices, such householders should be informed of and encouraged to observe the following five points when disposing of household garbage in order to secure safe handling of waste.

(1) Tie garbage bags tightly to seal them (see Figure 1)

This prevents garbage from scattering, and makes garbage bags easy to carry during collection and transportation.

(2) Remove air from garbage bags before putting them out

This makes garbage bags easy to carry during collection and transportation, and prevents them from bursting inside collection vehicles.

(3) Drain kitchen garbage

Where the amount of garbage from households has tended to increase due to people refraining from going out, this can reduce garbage bulk.

(4) Always try to reduce the amount of garbage

The amount of garbage from households has tended to

increase due to people refraining from going out, but trying to reduce the amount of garbage can reduce garbage bulk.

(5) Confirm local government separation and collection rules

This can eliminate the risk of infection caused by workers having to perform unnecessary garbage separation.

4.2 Medical Institutions

Medical institutions and testing institutions generate infectious waste such as medical materials used in the diagnosis, treatment, and testing of COVID-19. This infectious waste should be treated in accordance with the “Infectious Waste Treatment Manual Based on the Waste Management and Public Cleansing Act”⁶⁾.

When discharging the generated infectious waste, requests are made to medical institutions and testing facilities to pack it appropriately in accordance with its type and characteristics (see Figure 2).

When collecting and transporting infectious waste from medical institutions and testing institutions, the chance of contact between the workers involved should be reduced as much as possible.

4.3 Temporary Lodging Facilities

Regarding waste generated from facilities where people with mild cases of COVID-19 are accommodated and recuperating, laws regarding waste treatment and cleaning do not require this waste to be treated as infectious waste. However, when dealing with this

waste, appropriate measures should be taken to prevent infection of workers. Specifically, the measures indicated in “3. Measures When Performing Waste Treatment”, should be thoroughly applied.

In addition, when during actual work operations waste from the facility concerned is handled in the same manner as infectious waste, reasonable handling must be fully considered and performed so that this handling does not delay waste treatment and consequently increase public health risk.

4.4 Other Business Operations That Generate Waste

Even with waste for which the possibility of contamination with the COVID-19 virus is normally low, if such contamination is suspected — for example, in cases of having workers that have tested positive for COVID-19 — then the appropriate measures described in “3. Measures When Performing Waste Treatment” should be taken.

5. Conclusion

The proper disposal of waste is indispensable to the preservation of the living environment and protection of people's health (October 16, 1971, Ministry of Health and Welfare Circular No. 784 from Vice-Minister for Health and Welfare, notice to all prefectural governors and mayors of designated cities). In this unprecedented national crisis, the “Basic Policies for Novel Coronavirus Disease Control”⁵⁾ request that the waste management industry — as providers of a service that is indispensable to ensuring the minimum necessary in the lives of people staying at home — should continue operation.

Accordingly, this guideline is considered to be best practices that are instructive for organizations and concerned parties involved in the treatment of waste such as business waste (including infectious waste), household garbage, raw sewage, and septic tank sludge, to be suitably cautious of COVID-19 and act appropriately. Judgments should be made based on common sense, but some exceptions can be applied in accordance with individual circumstances and the actual conditions at relevant sites.

Although it is said that the risk of infection is higher for touching objects that have been touched by an unspecified large number of people, such as the straps on trains and handrails of stairs in public facilities, it cannot be said that the risk of infection is zero in waste management operations. With respect for the people concerned, it is hoped that each operator will formulate

its own guideline based on the guideline presented here.

As the situation changes in the future, this guideline will be revised as necessary.

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(Mr. Ryosuke Muraoka, Director, Training Department, Japan Environment Sanitation Center)

International Events at the 31th Annual Conference of the JSMCWM (Online) at Hokkaido University, Sapporo

The 31th Annual Conference of the Japan Society of Material Cycles and Waste Management (JSMCWM) was held online from September 16 (Wed) to 18 (Fri), 2020 at Hokkaido University in Sapporo. This article gives a brief report on the International Symposium and International Hybrid Session that were held at the conference.

1. International Symposium in response to COVID-19 on September 18 (Fri), 2020.

The International Symposium, “Sound Waste Management in Response to the Pandemic of COVID-19” was held online with the support by National Institute for Environment Studies, NIES, Japan.

COVID-19 has had a major impact on the lives of people around the world. The field of material cycles and waste management is no exception. Various effects have been already reported, e.g. the handling of potentially infectious waste, harmful rumors of waste management workers, and changes to waste generation due to the “new lifestyle”. Although some of these effects are common worldwide and some are unique to each country or region, there are many that require a quick response, and it is urgent to share and exchange scientific and policy knowledge. Therefore, this symposium was held with the purpose of reporting on and exchanging opinions about the latest considerations of international organizations, preliminary reports from each country and region of Asia and the Pacific, and for agreeing on a joint statement for future international cooperation.

Prof. Shin-ichi Sakai of Kyoto University, Japan, and the JSMCWM, chaired the symposium. Researchers

from international institutes and universities in the Asia-Pacific region gave presentations and discussed “Sound Waste Management in Response to the Pandemic of COVID-19”. Furthermore, the joint statement on concerned organizations’ contribution to proper waste management was proposed. More than 300 online participants had active discussions during the symposium.

The first lecture was presented by Mr. Kazunobu Onogawa, Director of IGES Centre Collaborating with UNEP on Environmental Technologies (CCET). He showed that the report, “Waste Management During the COVID-19 Pandemic: From Response to Recovery”, formulated and issued in August 2020 by IGES-CCET and the UNEP International Environmental Technology Centre (IETC), summarizes effective waste management methods and technology that can be implemented in developing countries. The second lecture was presented by Ms. Misato Dilley, Associate Expert at UNEP-IETC. She showed that women are exposed to high risks of infection during the COVID-19 pandemic in waste management and that support for women to be part of the decision-making process is important.

Six researchers gave presentations on country and regional reports as follows:

Dr. Nawa Raj Khatriwada, President and Program Coordinator, Nepal Development Research Institute (NDRI), presented a report that, due to lockdown, solid waste in Nepal was not collected for several days, and that waste collection workers have no protective gear and collect garbage that is not contained in plastic bags with bare hands.

Ms. Sitang Kongkratoke, Lecturer at the School of Health Science & Circular Economy for Waste-free Thailand (CEWT) Research Center, Mae Fah Luang University, presented a report that safety training programs, health checkups, and vaccinations, among other things, are provided for as safety measures for infectious waste collection in Thailand, and about the occurrence of infectious waste related to COVID-19 from hospitals.

Prof. Frank K. Griffin, Vice Chancellor of the University of Papua New Guinea, presented a report on the declaration of a national state of emergency related to COVID-19, the investment of resources into health measures to manage the pandemic, the implementation of waste management using decontamination and high-temperature incineration, and the burying of fly ash infectious materials.

Prof. Pinjing He, Head of the Institute of Waste Treatment & Reclamation, College of Environmental Science and Engineering, Tongji University, China, presented a report on the influence of COVID-19 on waste generation in China, wastes potentially contaminated by SARS-CoV-2, potentially infectious waste generated in different scenarios, policy and regulations in response to the pandemic, and the setting of relevant standards in waste management (separation, collection, and incineration) in response to COVID-19.

Prof. Daegi Kim, Vice-chair of the KSWM International Committee, Department of Environmental Engineering, College of Engineering, Daegu University, Korea, presented a report on the total amount of medical waste due to COVID-19, the provision of a special countermeasure for storage, transportation and disposal, the suspension of the policy for reducing the use of disposable cups for a period of time, and consideration of waste minimization at the distribution stage.

Prof. Masaki Takaoka, Kyoto University, Japan, presented a report on the history of waste management as a public health measure, standards in response to COVID-19 such as Disposal Manual for Infectious Waste and Guidelines for Measures against Novel Influenza in Waste Treatment which were established based on the Regulations of Waste Management and Public Cleansing Law of Japan, methods of infectious waste management, the effect of COVID-19 on waste management, and challenges of post-COVID-19.

At the Q&A session after the presentations, there were questions about methods for the disposal of protective gear, the estimation of infectious waste generation, and the contribution of NGOs to medical waste management, as well as a lively exchange of opinions.

Finally, the “Joint Statement on Societies’ Contribution to Sound Waste Management in Response to the Pandemic of COVID-19” was approved and signed by the Japan Society of Material Cycles and Waste Management, Korea Society of Waste Management, Society of Environmental Engineers of Nepal, Solid Waste Management Association - Thailand, China Municipal Environmental Sanitation Association, Secretariat of the Pacific Regional Environment Programme, and University of Papua New Guinea at a signing ceremony moderated by Prof. Reiko Soden, Shibaura Institute of Technology.

Presentation materials, the Joint Statement, and video distribution are available on the following web site: https://jsmcwm.or.jp/international/?page_id=1087.

2. International Hybrid Session on September 16 (Wednesday) and 17 (Thursday), 2020

The International Hybrid Session was held online (via Zoom) on September 16 (Wednesday) and 17 (Thursday). It consisted of five-minute oral presentations and three-minute discussions followed by 80-minute poster presentations with discussions (with three or four presenters in one Zoom session and 20 minutes per presenter). There were 37 presentations categorized according to six research fields (3R/waste management, LCA/MFA, recycle, thermal treatment, landfill, and hazardous waste). Because this was the first online session for the Annual Conference of the JSMCWM, several problems occurred like unclear sound and the server going down. However, all of the sessions were completed successfully with active discussions. Approximately 120-140 people attended the oral session and the poster sessions.

A breakdown of research themes includes seven presentations on 3R/waste management, seven on LCA/MFA, 12 on recycle, four on thermal treatment, four on landfills, and three on hazardous waste.

The oral presentations consisted of five-minute oral presentations and three-minute discussions (they were one minute with no discussion the previous year). All presenters had enough time to present their research contents and the three-minute discussions allowed for good communication between presenters and participants, contributing to active discussion at the poster sessions. At the poster session, communication between presenters with similar research interests resulted in active discussions and the sharing of information. The International Hybrid Session in this conference was organized effectively.

(Associate Prof. Dr. Hideki Yoshida, Muroran Institute of Technology)

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