

# TCE ENVIS

| PLASTIC WASTE MANAGEMENT |

## COVID 19

THIAGARAJAR COLLEGE OF ENGINEERING



TCE ENVIS RP



RESOURCE PARTNER ON PLASTIC WASTE MANAGEMENT

## NEWS LETTER

Volume III - Issue 1 : April - June 2020

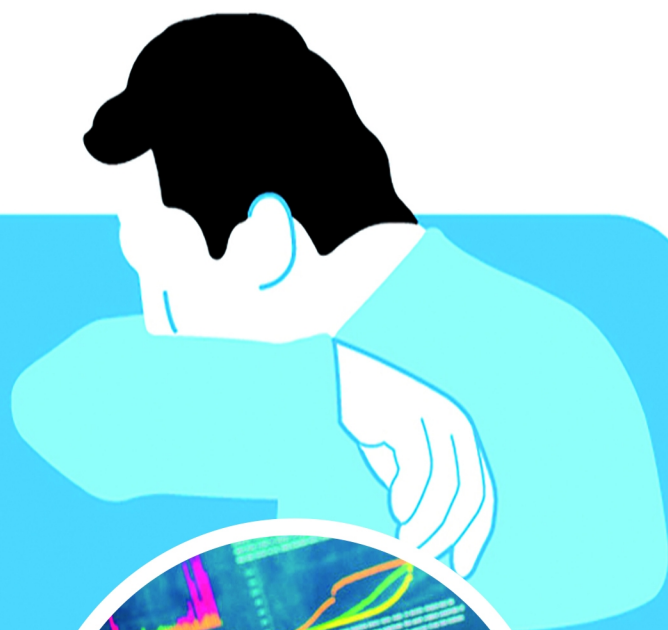
**Wash** your hands regularly with **soap** and **water**.



**Cover** your mouth and nose while **sneezing** or **coughing**.



**Avoid close contact** with anyone who has a cold or flu-like symptoms.



If you have fever, cough and difficulty breathing, **seek medical care early**.



[www.tceenvvis.in](http://www.tceenvvis.in)





## Editorial Message

Dear Readers,  
Greetings,

This issue is mainly focussed on the Covid – 19 problems, awareness, spreading and its contribution to the pollution. The use of single use plastics is increased manifold after the Covid – 19 pandemic started. People are house arrested due to the lockdown. The public started ordering online foods and all other essential good through online platform. This created a great need for packing materials. Where to go other than using plastics as the packaging materials. This issue presents a small technical note, which discusses about the details of SUP used during this period.

The issue also provides an awareness about the do's and don'ts to be followed during the Covid – 19 pandemics. We request all our readers to stay home and stay safe. Please behave socially responsible and let us fight together and win the race against COVID – 19

Thanks and Regards  
EDITOR

## Coronavirus (COVID-19) and tobacco use



Putting a tobacco product to your lips means your fingers come close to your face, which can spread the virus to your mouth, nose or eyes.



Tobacco use is often a social activity, so if you use tobacco with other people, you risk infecting each other with the virus.



Waterpipe users often share the same pipe – the virus can then be more easily spread from person to person.

### THE EFFECT OF THE CORONAVIRUS CAN BE WORSE FOR PEOPLE WHO USE TOBACCO

- Tobacco use leads to disease and disability and harms nearly every organ of the body, including the lungs.
- The coronavirus attacks the lungs – if your lungs are already damaged by tobacco use, the effects probably will be worse.
- Tobacco affects your immune system, meaning you're less able to fight off infections.



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Source: Elsevier -

Resources, Conservation & Recycling

As of May 15th, more than 4.5 million people worldwide has been infected and more than three hundred thousand died in the COVID-19 pandemic. To halt the epidemic, many countries have endorsed lockdown measures to ensure social distancing and reduce the pressure on medical institutions. Even after lockdowns, social distancing shall remain the norms for several months until herd immunity is built or/and the availability of COVID-19 specific anti-viral medicine and vaccination. The world gross domestic product (GDP) is expected to drop by 3.2 – 4.9% (UNDESA, 2020) demonstrating the serious effects of the pandemics on the world economy with the disruption of supply and production chains. The question of whether overall impacts on resource and waste management and the dynamics of material and energy flows will be positive remain uncertain. In this context, addressing the following points appear essential. waste management capacities. Finally, the disposable nature of masks and medical gowns raise the issue of hazardous waste management capacities. Developing countries are particularly at risk as the absence of proper waste management of these hazardous waste may further spread the virus.

#### 1. A pandemic that questions the viability of current supply chains

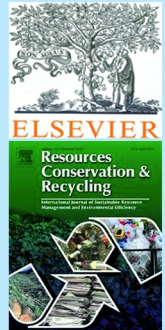
Criticality studies deal with the risk of supply disruption and the vulnerability of a system to this risk and usually concern rare geological resources (Graedel and Reck, 2015). The pandemics revealed the criticality of global supply chains could also concern usual commodities. Indeed, the first lockdown imposed in China in February revealed the dependency of the world economy to Chinese production as supply shortages related to metals, textiles, plastics, car parts, electronics, medicine and other goods for which China is the main world exporter occurred. After mid-March, many countries around the world imposed lockdown measures and production output went down in these countries reducing the demand on the parts produced in China. Health commodities experience an opposite trend with an increasing demand in all countries, especially Western countries where the absence of mask wearing habits and the lack of preparedness led to important mismatches between the supply and the demand for masks, medical gowns, disinfectant products, chemical products necessary for PCR tests and breathing apparatus. Critical studies are thus necessary to identify for all types of commodities the current vulnerabilities of supply chains, proposed more resilient ones and design more sustainable trade-off between local and global supply chains.

#### 2. A pandemic with many potential effects to investigate

- In industrial and service sectors, currently work-in-progress stocks in industries or service sectors cannot reach the market increasing storage costs and the risk of physical loss and obsolescence inventories. This issue is particularly important for companies producing perishable products such as restaurants and companies not using just-on-time logistics organization.
- In the agriculture sector, the current system is strongly dependent on temporary workers for the harvest of crops. With lockdown measures, the impossibility for these workers to access agricultural fields can result in food losses whereas the disruption of global supply chain may lead to the starvation of the many developing countries dependent on imports for their food supply.

- In the energy sector, reduction of commuting and industrial activities endorsed by lockdown measures may reduce overall energy consumption. On the other hand, the increase in the time spent at home is associated with an increase in the demand of electricity, gas and heat of households for space cooling/heating and household appliances. Besides, with telework suddenly becoming the norm, the pressure on internet connections and data centers increased and so did the associated energy consumption. The carbon content of electricity mix for each country will be determinant to evaluate the effect associated with the increase of these indoor activities.

- In the transportation sector, passenger transportation almost stopped during the lockdown, but home delivery of goods and food products increased so that the overall effect on air pollution remain unclear. Besides, even after the end of lockdown measures, social distancing will remain the norm favoring personal cars over collective means of transportation.





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Source: Elsevier -

Resources, Conservation & Recycling

○ In the waste management sector, reduction in industrial activities may lead to a diminution of industrial wastes. However, household wastes may increase due to increased home cooking and an increased demand of home delivery. In addition to household behavioral changes, movements from main residence to secondary residences observed in countries such as France before the enforcement of lockdown measures by authorities may add pressure to rural waste management capacities. Finally, the disposable nature of masks and medical gowns raise the issue of hazardous waste management capacities. Developing countries are particularly at risk as the absence of proper waste management of these hazardous waste may further spread the virus.

○ Regarding material stocks, it should be noted that contrary to earthquakes, floods, volcanoes eruption, and other natural disasters, the pandemic did not destroy any capital assets but only slowed down human flows and the processing of materials within the economy. In other words, capacity utilization of capital assets remains low as long as social distancing measures are in place but may come back to normal level at the end of the sanitary crisis. However, if the loss of income and consequent unemployment induced by the pandemics further contract the demand, the sanitary crisis may degenerate in an economic crisis leading to the obsolescence of capital assets and a degradation of the material stocks.

○ Regarding social innovation, the disruption of global supply chain has put in the frontline Fab lab and 3D printing for the local fabrication of masks and other health commodities and the use of substitution materials: cloth face mask made from pillowcases or 100% cotton t-shirts, and snorkeling masks turned into ventilators for hospitals (CDC, 2020; Nicholson et al., 2020). The economic viability of these productions in normal economic conditions is nonetheless doubtful and require investigation. The same can be claimed for telework whose large deployment during the sanitary crisis is a unique social experience, especially in countries like Japan where the precrisis use of telework is inexistent. The pandemics is a unique opportunity to better capture the strengths and weaknesses of these new organizations to see how they could contribute to the sustainability of our societies in normal conditions.

In conclusion, many uncertainties remain on the positive and negative effects of the pandemic on the resources and waste flows and stocks as transfer of environmental impact between sectors and regions may be expected. The worldwide degradation of economies will also play an important role in shaping the aftercrisis material world. The combination of analytical tools such as material flow analysis, life-cycle assessment, network analysis and input-output analysis appear necessary to fully comprehend the consequences of the COVID-19 epidemics. The development of such analyzes may however depend on our ability to collect unconventional data.

#### References:

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- Graedel, T.E., Reck, B.K., 2015. Six years of criticality assessments: what have we learned so far? *J. Ind. Ecol.* 30 (4). <https://doi.org/10.1111/jiec.12305>.
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## HOW TO PROTECT YOURSELF FROM CORONAVIRUS ?



Avoid touching your eyes nose, and mouth.



Wash your hands often with soap and water



Avoid close contact with people who are sick



Cover your cough or sneeze with a tissue



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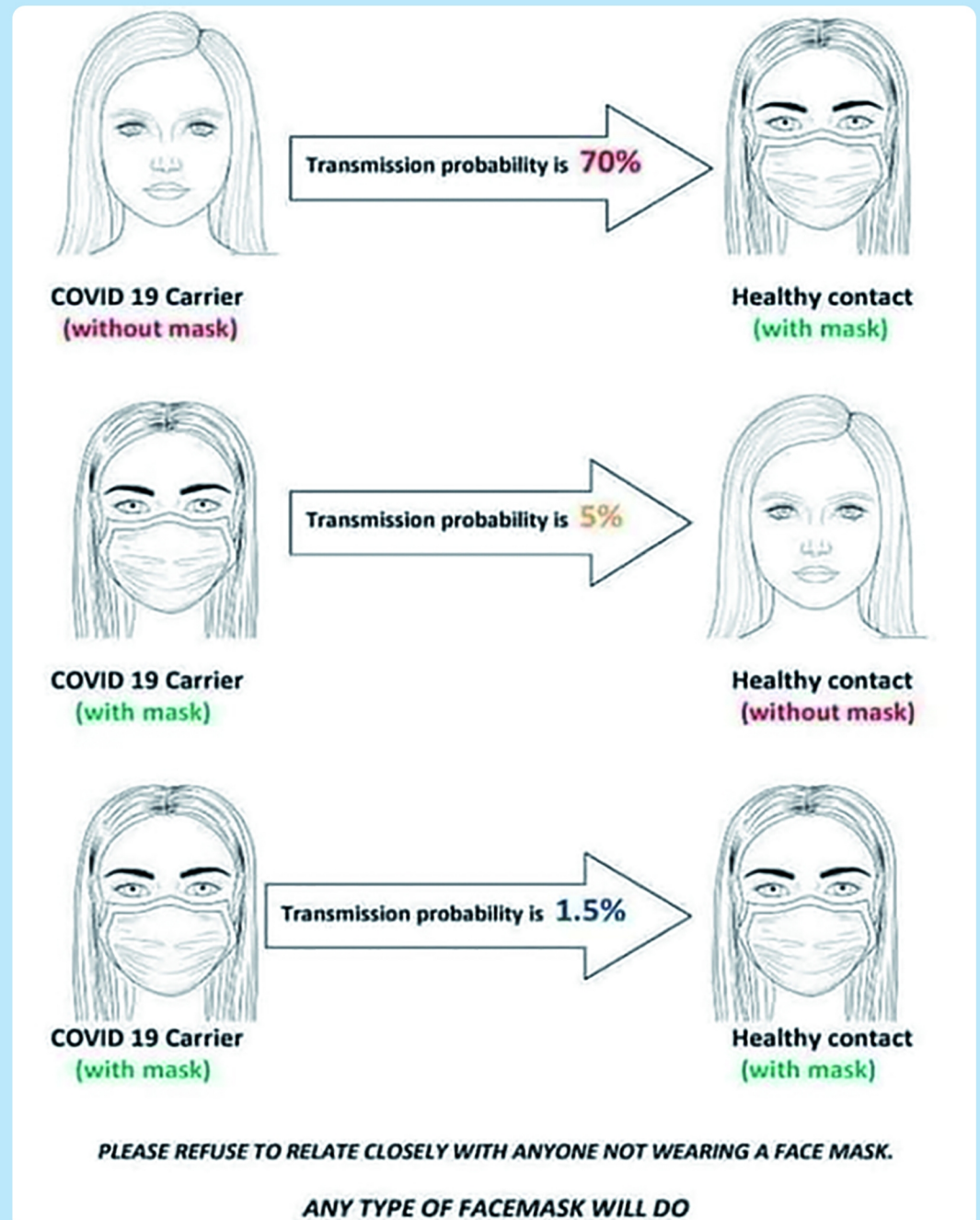
WITH THE emergence of COVID-19 has come the resurrection of single-use plastics, prompting renewed concern over pollution and calls for the considered management of waste generated by the global response to the pandemic.

“COVID-19 has led to a greater production and consumption of household and personal health-related products that could be single-use and contain valuable resources like plastics, textiles, metals, and electronics,” noted Chris Corbin, programme officer for the pollution and communications subprogrammes with the Ecosystems Division of the United Nations Environment Programme (UNEP).

“COVID-19 waste, and any other waste, must be collected and treated adequately to avoid littering or uncontrolled incineration, causing negative impacts to human health, ecosystem quality, biodiversity, including impacts on soil, rivers, coastal lines and in the marine system. For countries in the Caribbean who are so heavily dependent on their natural resources m,anagement of waste is critical,” he said.

According to Corbin, there is no question of the value such products have created as countries do battle with the highly infectious disease that has infected more than 23 million people and claimed more than 800,000 lives to date.

“There is no doubt that single-use plastics, including surgical masks, have been vital in responding to the COVID-19 pandemic. Some countries have reported reduction in overall solid waste generated, while others report increases, specifically in plastic waste, not just from masks and gloves, but also, for example, from home deliveries of food. Single-use plastics have been particularly important for front-line health workers and enabling home delivery of basic goods,” the UNEP programme officer said.



“However, the images of medical waste piling up outside hospitals, and used personal protective equipment floating in coastal waters and washing up on the world’s beaches, illustrate yet again that we have a serious challenge to managing the use and disposal of single-use plastics, especially in developing countries and small islands, such as Jamaica,” he added.

Marine scientist Professor Mona Webber is of a similar view.

“The single-use plastic increase is due to several things, one is the health industry. Hospitals and hospital workers have to be protected because the disease is highly contagious, and so the production and use of personal protective equipment is unavoidable. There is no question of compromising the health of our workers. Barriers have to be made and they have to be made out of plastic; and so the increase in that, and the number of layers persons have to have and how often these barriers have to change, is a given,” she said.

However, Webber said members of the public do not, for example, need to use reusable masks, which is important to embrace if countries are to successfully curtail the waste that is generated from single-use items.

“Masks used in the health sector have to be disposable. Masks that have to be used by the general public do not have to be. The protective equipment for our general population can be reusable and we have seen the industry that has sprung up from that. This will reduce the plastic litter,” she said.



# COVID-19 VIRUS

## Facts

Symptoms include fever, cough, and shortness of breath.

The virus typically appears 2-14 days after exposure.

It spreads primarily from person to person via coughs, sneezes, and close contact.

## Avoid Getting Sick

Wash hands often with soap and water especially after using the bathroom, before eating, and if hands are dirty. Use 60% alcohol based hand sanitizer if you do not have access to soap and water.

Avoid touching your nose, mouth, and eyes.

Do not come in close contact with people who are sick or share their household items. Keep commonly touched items clean.

Avoid public places if there is an outbreak.

## If You Get Sick

Stay home except to get medical care , get plenty of rest; drink adequate fluids.

Separate yourself from people and animals. Cover coughs and sneezes, wash hands often, and do not share household items.

Call your doctor if you have been exposed to covid-19, if you have any difficulty breathing, or have any concerns.



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In order to deal with COVID-19 pandemic, State and Central Governments have initiated various steps, which include setting up of quarantine centers/camps, Isolation wards, sample collection centers and laboratories.

Following specific guidelines for management of waste generated during diagnostics and treatment of COVID-19 suspected / confirmed patients, are required to be followed by all the stakeholders including isolation wards, quarantine centers, sample collection centers, laboratories, ULBs and common biomedical waste treatment and disposal facilities, in addition to existing practices under BMW Management Rules, 2016.



These guidelines are based on current knowledge on COVID-19 and existing practices in management of infectious waste generated in hospitals while treating viral and other contagious diseases like HIV, H1N1, etc. These guidelines will be updated if need arises. This Revision-1 of guidelines is done mainly to incorporate specific requirements and responsibilities of persons operating quarantine camps or caretakers of quarantine homes/home-care units and also the responsibilities of Urban Local Bodies (ULBs) at sections (c) and (f) respectively. Specific provisions are also incorporated for States not having common CBWTFs and for allowing hazardous waste incinerators to dispose COVID-19 waste.

Guidelines brought out by WHO, MoH&FW, ICMR, CDC and other concerned agencies from time to time may also be referred. Guidelines for handling, treatment and disposal of COVID-19 waste at Healthcare Facilities, Quarantine Camps/ Quarantine-homes/ Home-care, Sample Collection Centers, Laboratories, SPCBs/PCCs, ULBs and CBWTFs is given below;

#### (a) COVID-19 Isolation wards:

Healthcare Facilities having isolation wards for COVID-19 patients need to follow these steps to ensure safe handling and disposal of biomedical waste generated during treatment;

- Keep separate color coded bins/bags/containers in wards and maintain proper segregation of waste as per BMW Rules, 2016 as amended and CPCB guidelines for implementation of BMW Management Rules.
- As precaution double layered bags (using 2 bags) should be used for collection of waste from COVID-19 isolation wards so as to ensure adequate strength and no-leaks;
- Collect and store biomedical waste separately prior to handing over to the same CBWTF. Use a dedicated collection bin labelled as "COVID-19" to store COVID-19 waste and keep separately in temporary storage room prior to handing over to authorized staff of CBWTF. Biomedical waste collected in such isolation wards can also be lifted directly from ward into CBWTF collection van.
- In addition to mandatory labelling, bags/containers used for collecting biomedical waste from COVID-19 wards, should be labelled as "COVID-19 Waste". This marking would enable CBWTFs to identify the waste easily for priority treatment and disposal immediately upon the receipt.
- General waste not having contamination should be disposed as solid waste as per SWM Rules, 2016;
- Maintain separate record of waste generated from COVID-19 isolation wards
- Use dedicated trolleys and collection bins in COVID-19 isolation wards. A label "COVID-19 Waste" to be pasted on these items also.
- Report opening or operation of COVID-19 ward and COVID ICU ward to SPCBs and respective CBWTF located in the area.
- Depute dedicated sanitation workers separately for biomedical waste and general solid waste so that waste can be collected and transferred timely to temporary waste storage area.







#### (b) Sample Collection Centers and Laboratories for COVID-19 suspected patients:

Report opening or operation of COVID-19 sample collection centers and laboratories to concerned SPCB. Guidelines given at section (a) for isolation wards should be applied suitably in in case of test centers and laboratories also.



#### (c) Responsibilities of persons operating Quarantine Camps or Home-Care facilities\*:

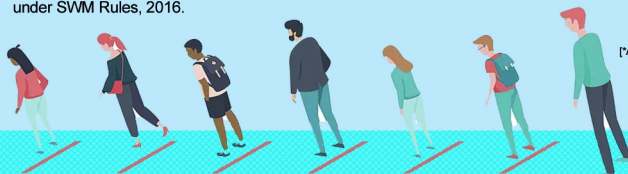
Less quantity of biomedical waste is expected from quarantine Camps / Quarantine home / home-care facilities. However, the persons responsible for operating quarantine camps / centers / home-care for suspected COVID-19 persons need to follow the below mentioned steps to ensure safe handling and disposal of waste;



- General solid waste (household waste) generated from quarantine centers or camps should be handed over to waste collector identified by Urban Local Bodies or as per the prevailing local method of disposing general solid waste.
- Biomedical waste if any generated from quarantine centers/camps should be collected separately in yellow colored bags (suitable for biomedical waste collection) provided by ULBs. These bags can be placed in separate and dedicated dust-bins of appropriate size.
- Persons operating Quarantine camps/centers should call the CBWTF operator to collect biomedical waste as and when it gets generated. Contact details of CBWTFs would be available with Local Authorities.
- Persons taking care of quarantine home / Home-care should deposit biomedical waste if any generated from suspected or recovered COVID-19 patients, by following any of the following methods as may be arranged by ULBs;
  - Hand over the yellow bags containing biomedical waste to authorized waste collectors at door steps engaged by local bodies; or
  - Deposit biomedical waste in yellow bags at designated deposition Centers established by ULBs. The bag again be stored in yellow bag or container; or
  - Handover the biomedical waste to waste collector engaged by CBWTF operator at the doorstep.
- Persons operating Quarantine camps/centers or Quarantine-homes/Home-care should report to ULBs in case of any difficulty in getting the services for disposal of solid waste or biomedical waste.

#### Clarifications:

- Quarantine Camps / Quarantine-Home / Home-care are the places where suspected people or the contacts of suspected / confirmed cases who have been directed by authorised hospitals or local authorities to stay at home for at least 14 days for observation for any symptom of COVID-19, if any.
- Patients positive for COVID-19 will not be treated at Quarantine Camps / Quarantine-Home / Home-care unless such situation is notified by the State/Central Governments.
- Biomedical waste at Quarantine Camps / Home-care will comprise of used syringes, date expired or discarded medicines, used masks/gloves and in case of patients with other chronic diseases may also include drain bags, urine bags, body fluid or blood soaked tissues/cotton, empty ampules etc.
- Biomedical waste generated from Quarantine Camps / Quarantine-Home / Home-care would be treated as 'domestic hazardous waste' as defined under Solid Waste Management Rules, 2016, and shall be disposed as per provisions under Biomedical Waste Management Rules, 2016 and these guidelines.
- General waste from Quarantine Camps / Quarantine-Home / Home-care shall be disposed as Solid waste as per provisions under SWM Rules, 2016.



[\*Amended in Rev. 1 of guidelines dated 24/03/2020]



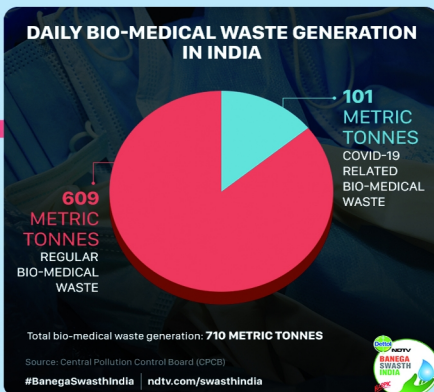
### (d) Duties of Common Biomedical Waste Treatment Facility (CBWTF):

- Report to SPCBs/PCCs about receiving of waste from COVID-19 isolation wards / Quarantine Camps / Quarantined homes / COVID-19 Testing Centers;
- Operator of CBWTF shall ensure regular sanitization of workers involved in handling and collection of biomedical waste;
- Workers shall be provided with adequate PPEs including three layer masks, splash proof aprons/gowns, nitrile gloves, gum boots and safety goggles;
- Use dedicated vehicle to collect COVID-19 ward waste. It is not necessary to place separate label on such vehicles;
- Vehicle should be sanitized with sodium hypochlorite or any appropriate chemical disinfectant after every trip.
- COVID-19 waste should be disposed-off immediately upon receipt at facility.
- In case it is required to treat and dispose more quantity of biomedical waste generated from COVID-19 treatment, CBWTF may operate their facilities for extra hours, by giving information to SPCBs/PCCs.
- Operator of CBWTF shall maintain separate record for collection, treatment and disposal of COVID-19 waste.
- Do not allow any worker showing symptoms of illness to work at the facility. May provide adequate leave to such workers and by protecting their salary.



### (e) Duties of SPCBs/PCCs :

- Shall maintain records of COVID-19 treatment wards / quarantine centers / quarantines homes in respective States.
- Ensure proper collection and disposal of biomedical waste as per BMW Rules, 2016 and SoPS given in this guidance document;
- Allow CBWTFs to operate for extra hours as per requirement;
- May not insist on authorisation of quarantine camps as such facilities does not qualify as health facilities. However, may allow CBWTFs to collect biomedical waste as and when required;
- In case of States not having CBWTFs as well as rural or remote areas, not having access to CBWTFs, the existing captive facilities of any hospital may be identified for disposal of COVID- 19 waste as per provisions under BMW Rules, 2016 and these guidelines.
- Coordinate with CBWTFs and ULBs in establishing adequate collection and disposal of COVID- 19 waste.
- In case of generation of large volume of yellow color coded (incinerable) COVID-19 waste, permit HW incinerators at existing TSDFs to incinerate the same by ensuring separate arrangement for handling and waste feeding.



### (f) Duties of Urban Local Bodies +:

Urban Local Bodies are responsible for ensuring safe collection and disposal of biomedical waste, if any, generated from Quarantine Camps/ Quarantine Homes/ Home Care for COVID-19 suspected persons.

- Information on each Quarantine Camps/ Quarantine Homes/ Home-Care should be available with local administration and provide updated list to SPCBs from time to time;



- In case of quarantine camps, ensure that biomedical waste is collected directly by CBWTFs identified by ULB. Waste from quarantine camps to be lifted by CBWTFs on call basis as and when the biomedical waste gets generated. Provide contact details of CBWTF operator at Quarantine Camps;
- Provide necessary support, security including authorisation to staff of CBWTFs;
- ULB shall engage CBWTF operator for ultimate disposal of biomedical waste collected from quarantine home / home care or waste deposition centers or from door steps as may be required depending on local situation; ULB shall make agreement with CBWTF in this regard.
- ULBs envisage following options to facilitate safe collection and disposal of biomedical waste from quarantined homes/Home care;
  - a) Engage authorized waste collectors for door steps collection of biomedical waste and transfer to collection points for further pick-up by CBWTF; and/or
  - b) In case number of quarantined homes/Home-care units are less, ULBs may engage services of CBWTFs to collect the waste directly from door-steps.
- Provide yellow colored bags (designated for BMW) to the persons responsible for operating Quarantine Camp or home-care. If required, such bags may be provided through CBWTF.
- ULBs shall the following in engaging authorized waste collectors at door-steps or at waste deposition centers;
  - o Create a separate team of workers who shall be engaged in door step waste collection at waste deposition centres or at quarantine homes or home care.
  - o Ensure that only designated staff collects biomedical waste from quarantine homes or home care.
  - o Training should be provided for sanitization, about collection of biomedical waste, precautionary measures to handle biomedical waste.
  - o Impart training to waste collector in handling of biomedical waste including methods of sanitization. Training to waste collectors should be arranged through CBWTF operators;
  - o The staff involved in handling and collection of waste from quarantine homes or home care centers shall be provided with adequate Personnel Protective Equipment such as three layer masks, splash proof aprons/gowns, heavy-duty gloves, gum boots and safety goggles. These PPEs are required to be worn all the time while collecting of waste from quarantine center/quarantine homes/home care/waste deposition centres.
  - o Use dedicated carts / trolleys / vehicles for transport of biomedical waste. Ensure sanitization of vehicles with 1% hypochlorite after each trip.
  - o Ensure that, waste collectors arriving at quarantine center or at home care shall spray the disinfectant (1% hypochlorite solution) on the bin used for yellow bag.
- Establish common waste deposition centers (as stipulated under SWM Rules, 2016) for receiving / collection of biomedical waste. For this purpose, existing Dhalaos if any may be converted suitably.
- The general solid waste collected from quarantine homes or home care shall be disposed off as per SWM Rules, 2016.
- Services of Common Biomedical Waste Treatment & Disposal Facilities (CBWTFs) and staff associated with CBWTFs for collection, transportation, treatment and disposal of biomedical waste generated from hospitals including COVID-19 isolation wards, Quarantine Camps, etc. may be considered an essential service as part of health infrastructure.
- Facilitate smooth operations of CBWTFs.





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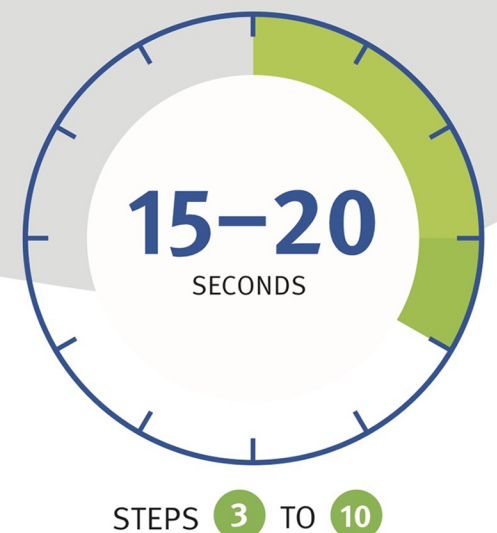
## CLEAN HANDS

### SAVE LIVES

12 steps to successful everyday handwashing

We Can Beat  
Covid Together

Duration  
of hand-wash



Wet hands  
with water.



Apply enough soap to cover  
all hand surfaces.



Lather thoroughly.



Rub hands palm to palm.



Rub hands palm to palm  
with fingers interlaced.



Rub back of hand using the  
palm of the other with  
fingers interlaced.



In a circular motion rub  
the tips of fingers in the  
palm of the opposite hand.



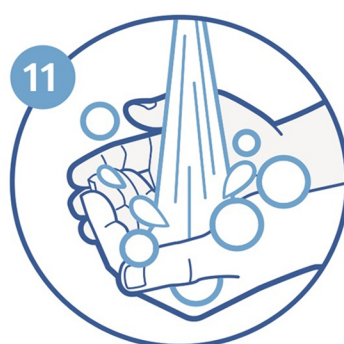
Clean thumb by  
holding it in the other  
hand and rotating.



Rub wrist with  
the opposite hand.



Interlock fingers and  
rub back of fingers  
on opposite palms.



Rinse hands  
with water.



Dry hands with  
clean paper towel and use  
paper towel to turn off tap.

**Researchers think that if everyone washed their hands properly, about 1 million lives would be saved every year.<sup>1</sup>**

When performed correctly, hand hygiene results in a reduction of microorganisms on hands. Poor hand hygiene contributes to the spread of pathogens, which can cause health issues such as gastrointestinal and respiratory infections.

**Please note:** These guidelines are for social handwashing only, such as after toilet use and before touching food. This poster is not intended for use in clinical settings.

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