E-Newsletter July-Sept. 2020

Bio-Medical Waste, COVID-19 and SDG3

"Corona has exposed the fragility of healthcare systems, the inefficiency of social protections frameworks, and the lack of economic resilience."

–John Hopkins University and Medicine –
Coronavirus Research Centre, May 2020

Bio-Medical waste, according to BMW Rules 2016 means any medical waste, which is generated during the diagnosis, treatment or immunisation of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps and in other categories. According to the Rules Bio-Medical waste treatment and disposal facility means any facility wherein treatment, disposal of bio-medical waste or processes incidental to such treatment and disposal is carried out, and includes common Bio-Medical waste treatment facilities.

- Ministry of Environment & Forests, 28th March 2016

COVID-19 is a disease caused by new coronavirus detected in 2019. Novel coronavirus are a family of single-stranded enveloped RNA viruses. The COVID-19 transmission occurs via inhalation, fomite and hand contamination with exposure to the nasal and pharyngeal mucus membranes, but much less likely via direct contact. There is 82% similarity between SARS-CoV2 and SARS-CoV detected earlier. The COVID-19 due to SARS-CoV2 seems to be spreading easily and sustainably in the community. Excessive Bio-Medical waste being generated has become a new major threat to public health and the environment. Proper handling of the waste is required for the safely of health workers.

Are we prepared for handling COVID-19 Waste?

Editorial

From Editor

Pandemic COVID-19 crisis has given rise to generation of new biomedical toxic waste and its management has become the uppermost challenge before the nations. With the rapidity of spread of COVID-19disease, the waste has grown manifolds and its proper handling has been a dilemma before those concerned with human health and environment?

The Climate Change Research Institute presents this ***E-newsletter on Bio-Medical Waste, COVID-19 and SDG3*** *to throw light on COVID-19 waste. Why it needs extra precautions and what actions are being taken to address the concerns? How this crisis can be an opportunity to accelerate our drive for achieving Sustainable Development Goals and its relation to Ayushman Bharat mission, are other topics covered.*

The Institute is fulfilling its Scientific Social Responsibility (SSR) with scientists and engineers putting their heads together to inform youth about the ecosystem changes and emerging environment challenges. The CCRI has been providing policy advocacy through scientific solutions on topics of societal interest.

I thankfully acknowledge various sources for the material presented in the newsletter.

Dr (Mrs) Malti Goel
President, Climate Change Research

"The treatment of infectious biomedical waste is an essential element to the fight against COVID-19"

How is India handling its Bio-Medical Waste?

First Regulations to handle Bio-Medical waste as BMW Rules came in 1998. The rules were amended as BMW rules 2016 with many salient features.

In 2018 it was noted that only about 10%–25% of the BMW is hazardous, which caused physical, chemical, and/or microbiological risks to the general population and health-care workers associated with handling, treatment, and disposal of waste. Based on then current knowledge and practices in the management of infectious waste generated in hospitals while treating viral and contagious diseases new guidelines were formulated in April 2018.

Due to the outbreak of pandemic in 2020, there has been a significant shift in the percentage of hazardous in the non-hazardous, producing a larger share of hazardous waste. With this in view third revision to BMW Rules has been published by the Central Pollution Control Board (CPCB) on June 10, 2020, which identified responsibilities of hospitals and health care units as below.

- Emphasise on taking extra care at COVID-19 isolation wards.
- Introduction of Foot-operated lids in colour-coded bins to avoid contact.
- General solid waste like medicine wrappers and cartons, syringes, fruit peels, empty bottles, discarded paper and other items not contaminated by patients' secretions and body fluids must be collected separately.
- From COVID-19 isolation wards, used PPEs such as goggles, face-shield, splash proof apron, plastic coveralls, hazmat suits, nitrile gloves must be collected into a red bag.

Double-layered bags and dedicated collection
Bins labelled as "COVID-19" are recommended

Are we ready for the recycling of Bio-Medical Waste produced through COVID-19 in Rural and Urban Areas?

कोविड-19 के बायोमेडिकल अपशिष्ट से कैसे निपटे गाँव या कस्बे?

- कोविड-19 चिंहित किए हुए क्वारंटीन घरों में पीले रंग के पॉलीबैग बटवाएं और सुनिश्चित करें कि ये घर इसी बैग में वेस्ट डालकर चिहित किए हुए कर्मचारी को ही देंगे।
- अलग से पीले बैग इकट्ठा करने के लिए वहां वाहन और टीम सुनिश्चित करें।
- इस टीम को पूरे तरीके से सावधानी बरतने और पर्सनल प्रोटेक्टिव इक्विपमेंट्स पहनने और उतारने की ट्रेनिंग दिलवाएं।
- सुनिश्चित करें कि इस टीम को रोज पता हो कि किन घरों से पीले बैग इकट्ठा करके लाने हैं और उनके कचरेदान को निस्संक्रामक करना है।
- सुनिश्चित करें कि टीम का कोई कर्मचारी इस कोविड-19 के आशंकित अपशिष्ट के संपर्क में न आए। न ही इकट्ठा करते समय और न ही कचरे का निपटान करते समय।
- यह सुनिश्चित करें कि अपशिष्ट इकट्ठा करने वाली गाड़ी, ट्रॉली और औजार हर एक दौरे के बाद निस्संक्रामक किए जाएं।
- इकट्ठा किए हुए पीले बैग को जल्द से जल्द निस्संक्रामक करें और प्लास्टिक या मेटल के ड्रम में तीनचौथाई भाग तक भरवाकर बाकि सीमेंट के मसाले या चिकनी मिट्टी में भरवा दें और सील करा दें।
- सूखने के तुरंत उपरांत इन ड्रम को 2m से अधिक गहरे गड्ढे में गढ़वाएं। सुनिश्चित करें कि ड्रम के ऊपर करीब 50cm की मिट्टी हो। ये गड्ढे ऐसी जगह हो जहाँ जल भराव की समस्या भी न हो और भूजल स्तर 6m से गहरा हो। ये गड्ढे घर और आबादी से दूर होने चाहिए।

नोट: यह प्रक्रिया सिर्फ उन ग्रामीण इलाकों के लिए है जिनका बायोमेडिकल वेस्ट ट्रीटमेंट एंड डिस्पोजल यूनिट्स के साथ कॉन्ट्रैक्ट नहीं है।

*यह उपाय भारत सरकार द्वारा घोषित बायोमेडिकल वेस्ट मैनेजमेंट रूल्स 2016 और इंटरनेशनल सॉलिड वेस्ट एसोसिएशन के कोविड-19 वेस्ट के मैनेजमेंट की सिफारिशों पर निर्धारित हैं।

Garbage transfer and transport

Are we on the right track?

Preparing to fight the Pandemic

Why Corona Bio-Medical Waste need Better Management?

Personal protective equipment (PPE) such as face masks, gloves, goggles, gowns, and aprons are essential items used by the corona warriors to help protect individuals from exposure to pathogens and contaminants. The PPE use against pathogens has been there earlier in the hospital environment. But the COVID-19 global pandemic has necessitated that PPE is used in the domestic environment, in offices, in shops, in parlours, by policemen. This is resulting in rapid accumulation of potentially infectious PPE in solid waste streams.

There might be a serious risk of spreading SARS-CoV2 if used- masks, gloves, and other personal protective equipment are not properly managed and disposed. Additionally, household waste (eg. tissues, masks, gloves) puts waste management workers at increased health risk.

The informal sector of waste management, Rag pickers getting direct exposure to COVID-related waste.

Infected biomedical waste, when not managed soundly and is subject to uncontrolled improper dumping, leads to public health risks. An estimated ragpickers' workforce of 1.5 to 4.0 million in the internal sector in our country performs waste collection, sorting and recycling. If not informed or their safety issues are not addressed, their health can be put at risk and they become more prone to the infection. Ragpickers' or Wastepickers' as they are now called, see an opportunity to scavenge on plastic. This exposure to the COVID-19 related waste is quite high, thereby pushing more people into this pandemic.

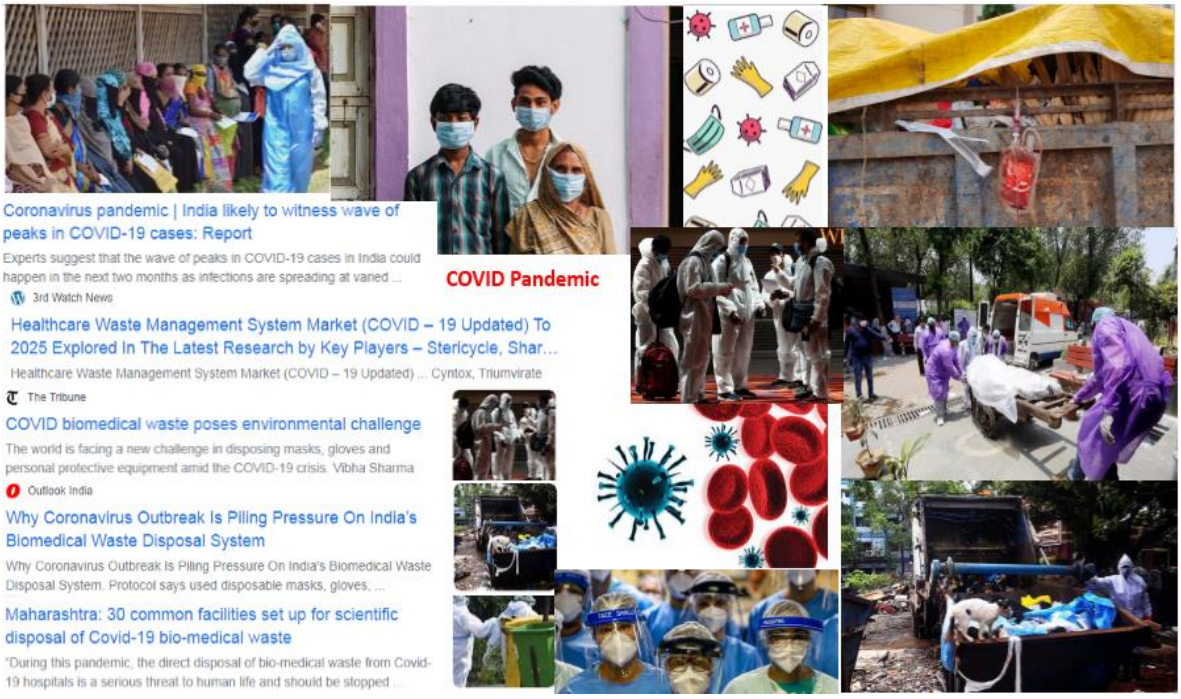
AIIMS Infection Control System Manual

Red Bin	PPEs	Local Disinfection method to be used
Red Bin-01	Goggles/ Face shield	Immerse in 0.5% sodium hypochlorite solution (freshly prepared) for 10 minutes, dry and wipe with 70% alcohol swab
Red Bin-02	N-95 Masks, Coveralls	Store in double bags (red) and hand over twice daily to the authorized staff from sanitation & housekeeping services.
Red Bin-03	Disposable PPEs	To be handed over to authorized waste collecting staff of M/s Biotic Waste Solutions Pvt. Ltd.

Coronavirus Outbreak is Piling Pressure on India's Bio-Medical Waste Disposal System.

The Central Pollution Control Board (CPCB), India as per new guidelines issued in June 2020 to ensure safety for disposal of COVID-19 waste providing directions as below.

"Collect and store Bio-Medical waste separately prior to handing over the same (to) Common Bio-Medical Waste Treatment Facility (CBWTF). Use a dedicated collection bin labelled as COVID-19 to store COVID-19 waste and keep separately in a temporary storage room prior to handing over to the authorised staff of the CBWTF. Bio-Medical waste collected in such isolation wards can also be lifted directly from ward into CBWTF collection van."



India has accelerated the process of waste management, created 198 Common Bio-Medical Waste Treatment and Disposal Facility (CBMWTF) and 225 Captive incinerators.

- The CPCB has directed Generators that masks and gloves used by everyone, whether infected or not, should be cut and kept in paper bags for minimum 72 hours before disposing off them.
- Ensure regular sanitisation of workers involved in handling and collection of biomedical waste and that they should be provided with adequate PPE including three-layer masks, splash-proof aprons/gowns, nitrile gloves, gumboots and safety goggles.
- Commercial establishments, shopping malls, institutions and offices to follow the same procedure with discarded protective personal equipment, PPE from general public.

How Different States are handling their COVID-19 Waste?

States of India have made a few amendments as per local situation to tackle the Bio-Medical waste, to consider operation of common Bio-Medical waste treatment and disposal facility.

In **Mumbai**, Maharashtra Pollution Control Board (MPCB) has given directives to dispose COVID-19 related Bio-Medical waste within 48 hours of collection. The MPCB said it has authorised 30 common Bio-Medical waste treatment facilities for scientific disposal of COVID-19 related waste to serve healthcare establishments/ hospitals operating in the state. 82% of urban local bodies in Maharashtra have set up separate teams for the collection of contaminated COVID-19 waste.

Karnataka, has come up with amendments in the Karnataka Epidemic Diseases, for COVID-19. Regulations 2020 notified are in the gazette under the Epidemic Diseases Act, to prevent the outbreak and spread of COVID-19, came into force for one year from 11th March 2020.

The **Bihar** State Pollution Control Board (BPCB) and Confederation of Indian Industry (CII) conducted a webinar for moving unidirectionally towards a healthy environment. Came up with solutions to reuse the PPE kit and to reduce the Bio-Medical waste down to 50%.

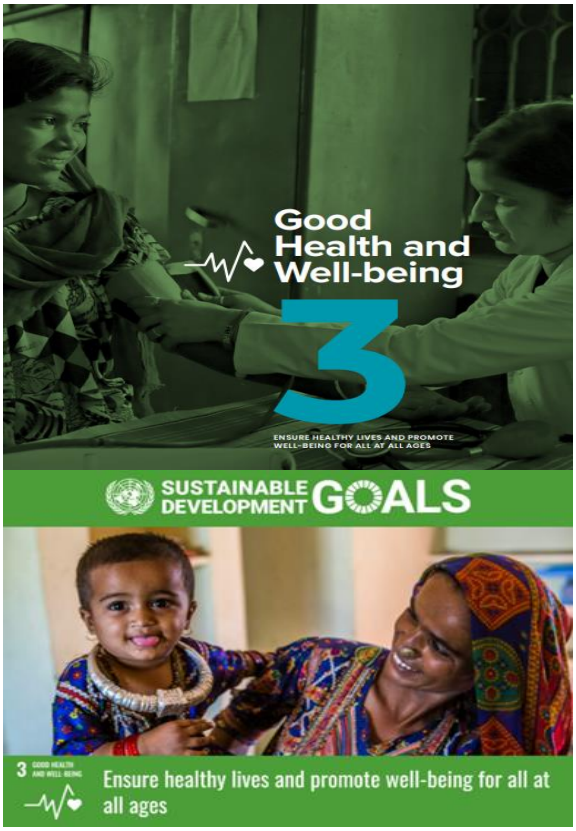
In **Delhi**, the two CBWTFs namely; SMS Water Grace BMW Private Limited in *Nilothi*, West Delhi and Biotic Waste Solutions Private Limited in *Jahangirpuri*, having an operational capacity of 12 tonnes and 34 tonnes per day respectively are actively taking the load of Delhi's Bio-Medical waste. Together, these facilities are collecting wastes from hospitals and have been disposing of both COVID-19 and non-COVID-19 waste.

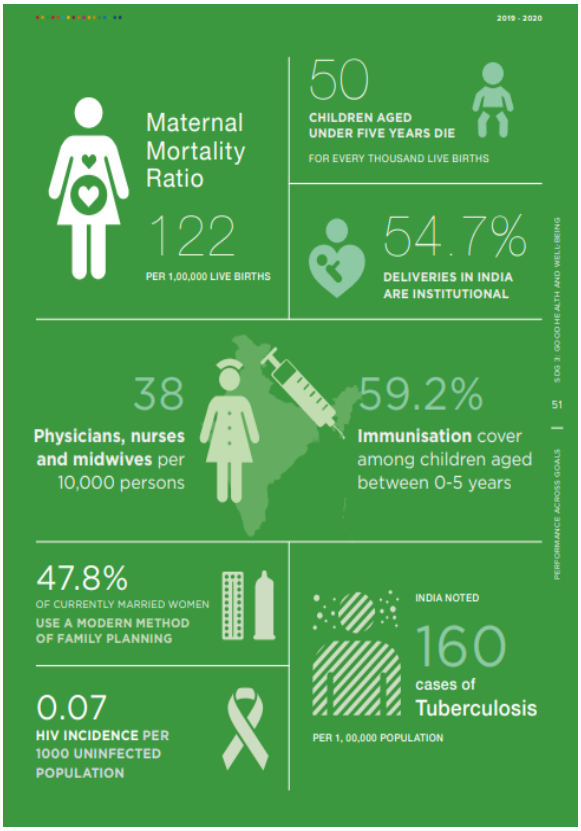
A biomedical waste management facility in Himachal Pradesh. Photo by Barusahib/Wikimedia Commons.

SDG3 (Good Health and Well-Being) and COVID-19

The United Nations Sustainable Development Goals (SDGs) enunciated 17 global goals in 2015 with the aim of transforming the world by 2030 through the fight against extreme poverty, inequality, injustice and climate change and in the search for a more prosperous, equitable, and sustainable world. The SDGS are alarming bell for action by all countries, rich and poor to promote prosperity while protecting the planet.

SDG3 aims to ensure that people enjoy a level of health that enables them to lead a socially and economically productive life. It aims to end preventable deaths across all ages from communicable and non-communicable diseases and illnesses caused by air, water, and soil pollution and contamination. *(*NITI Aayog, 2018)





Success in Bio-Medical waste management can speed up all round progress towards meeting Goal3, and also indirectly many others.

Linkage to SDG13:Climate Action - Air pollution and toxic waste pose serious health risks. Open dumping and open burning of medical household waste causes serious pollution that poses threats to human health and to the environment. Biomedical Waste Management has become an urgent and essential public service during the COVID-19 to minimize possible secondary impacts upon health, environment, and climate change.

Government Initiatives for SDG3

How CBWTF works

Arvind Bhardwaj, Manager at Hoswin Incinerator Pvt. Ltd., a Bio-Medical waste treatment faculty has suggested following for actions.

-Left-over food, disposable plates, glasses, used masks, tissues, toiletries, etc. used by COVID-19 patients to be classified as biomedical waste and should be put in yellow-coloured bags, while used gloves should be put in red bags.

-This would demarcate the type of COVID-19 waste that needs to be incinerated and the kind that can be disinfected, autoclaved (a process that kills bacteria, viruses, etc.) and disposed.

-It would help in reducing the quantity of COVID-19 waste generated and reduce unnecessary burden on CBWTFs for incineration as well.

-Designated nodal officers for biomedical waste management in hospitals must be made responsible for training waste handlers about infection prevention measures, according to the guidelines.

It is the responsibility of people operating quarantine camps homes or homecare facilities to hand over general municipal solid waste to waste collectors identified by ULBs.

The initiatives of the Government of India cover many dimensions of the Goal3, which include reducing mortality, reducing the spread of communicable and non-communicable diseases and ensuring universal health coverage namely;.

The National Health Mission (NHM), which encompasses two sub-missions- National Rural Health Mission (NRHM) and National Rural Health Mission (NRHM) aims to provide universal access to health care by strengthening systems, institutions and human resource capabilities.

The AYUSHMAN BHARAT- Pradhan Mantri Jan Aarogya Yojana (PMJAY) towards achieving universal health coverage, provides a health insurance cover of INR 100,000 per person to all for secondary and tertiary care hospitalization, covering 10 crore poor and vulnerable families.

Mission INDRADHANUSH to achieve total immunization coverage for newly born children in India.

Post COVID-19

The COVID-19 pandemic is causing trauma in health care among the economies across the globe. Lack of adequate infrastructure has left the societies and governments underprepared and potentially overwhelmed by COVID-19.

Taking new initiatives India has mounted efforts in manufacturing masks, PPE kits, diagnostics kits and rapid testing kits to achieve self-sufficiency to face COVID-19. India is actively engaged in developing vaccine for the pandemic through industry-academia partnership and in joint international ventures to benefit the entire country. Innovations in COVID-19 Bio-Medical Waste Treatment are being looked at the highest level by the Prime Minister's Science, Technology and Innovation Advisory Council (PM-STIAC).

Ayushman Bharat and SDG3

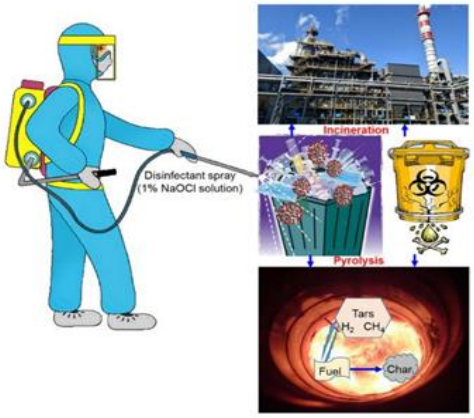
"The COVID-19 pandemic, which has presented challenges for several nations, could be an opportunity for India to speed up the health insurance scheme Ayushman Bharat, especially with a focus on primary healthcare"

- WHO Chief

AYUSHMAN BHARAT-Pradhan Mantri Jan Aarogya Yojana (PM-JAY**)** launched in 2018 aims to provide coverage of up to five lakhs INR per family per year for secondary and tertiary care hospitalization, covering 100 million poor and vulnerable families. It is currently testing and treating patients to provide universal access to health care by strengthening systems, institutions and human resource capabilities. It has benefitted 530 million populations so far.

"To speed up *Ayushman Bharat* scheme to fight COVID-19 pandemic", the Supreme Court of India directed the National Health Authority (NHA) to explore if the private hospitals can treat COVID-19 cases at Ayushman Bharat rate. In response to this, NHA has made calls to disseminate information on a Precaution Advisory to the beneficiaries of the scheme, including senior citizens, who are at a higher risk of contracting the novel coronavirus.

The fight against COVID-19 has put emphasis on preventing the further spread of infection. The government guidelines are focused on use of maintaining physical distancing and basic hygiene, expanding testing, contact tracing, and imposing restrictions on movement of people during un-lockdowns. The PM-JAY aspires that the most vulnerable have access to healthcare, especially to medicines and vaccines, and add to achieve targets of SDG3 during corona times.



What other steps would be needed?

- ✓ There is a large increase in the amount of single -use plastics being used for protection from COVID-19. So, we should aim at individual level, reduce our single use plastic waste.

- ✓ For management of waste, there is need for maximizing the use of available waste management solutions and also adopting 3S (Sorting, Segregation and Storage) methodology more rigorously.

- ✓ Start-ups under Atmanirbhar Bharat could set up Energy-from-Waste Plants for treating infectious biomedical waste. Those NGOs and organizations engaged in the waste management sector, should collaborate to reduce the Bio-Medical waste.

- ✓ The Bio-Medical waste generated due to corona virus infection like masks, personal protective equipment (PPE), gloves, gowns can be heat-treated by combustion.

- ✓ The hospitals could acquire waste incinerators to strengthen public healthcare systems.

- ✓ For going Vocal for Local, hospitals or institutes should be aiming at locally manufactured incinerators.

- ✓ The NGOs and CSO level organisations could create Awareness amongst the society as well as amongst the waste workers about safety and ways to reduce the biomedical waste.

The Climate Change Research Institute credits all Organizations working in the waste management to handle the OVID-19 biomedical waste. It is the need of hour to safely dispose and recycle the biomedical waste.

"In COVID-19, people must know how to protect themselves - from immediate contamination but also long-term health risks caused by toxic pollutants. Treat household medical waste responsibly: don't dump, don't open burn."

- Tessa Goverse, Coordinator, Chemicals, Waste and Air Quality Programme, UNEP

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30 September. 2020