Toxics Link
for a toxics-free world

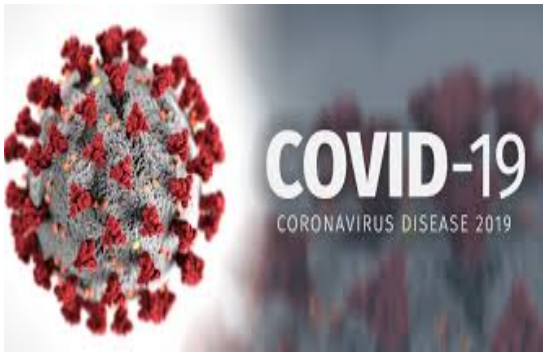
COVID WASTE

How has Delhi managed it?

Toxics Link,2020

COVID-19:
INTRODUCTION

Coronavirus Disease 2019, also known as COVID-19, is a disease caused by Coronavirus which was unknown until its discovery following an outbreak in Wuhan, China in December 2019[1]. Coronavirus is a large family of viruses known to cause a variety of diseases in both men and animals. These diseases range from mild respiratory infections like the common cold



to fatal conditions like Severe Acute Respiratory Syndrome (SARS). It got a status of Public Health Emergency of International Concern (EPHIC) on 30th January 2020 by the World Health Organization and was soon declared as a Pandemic. During the writing of this report, the global tally stands at 41,040,621 confirmed cases spreading across 216 countries with 1,129,591 deaths reported due to the pandemic [2].

COVID-19 spreads through human to human transmission and the causative virus is highly contagious in nature. A possible source of initial spread is considered to be animals, but research is still underway and no concrete evidence is yet found to establish the aforesaid relationship. Being a novel outbreak, a lot of information is still not available for the COVID-19 pandemic, but it is being suggested that the virus spreads through droplets released from the nose or mouth when a person having COVID-19 cough, sneezes or speaks. About 80% of the people may recover without needing hospitalization, but owing to its highly infectious nature, the affected person requires isolation at home or a quarantine facility. Around 1 in 5 people may develop severe symptoms, like difficulty in breathing and require hospital care. COVID-19 is known to cause severe symptoms in people with co-morbidities like Asthma, Diabetes, Heart Disease, etc. It may also be possible that a person gets COVID-19 by touching a surface or object contaminated by the virus and then touching their mouth, nose

[1] "World Health Organization." https://www.who.int/. Accessed 10 Aug. 2020.
[2] "Coronavirus Update (Live): 32092231 ...." https://www.worldometers.info/coronavirus/. Accessed 21st October, 2020.

or may be their eyes. COVID-19 virus survives on surfaces but researches have shown large variability, ranging from 2 hours to 9 days.

The COVID-19 is contagious in nature but it is also one of the easiest pathogens to destroy. Study shows that the virus can be destroyed at 56℃ within 30 minutes and within 70℃ within 5 minutes. The similar study also shows that the virus can be inactivated within five minutes after using 70% ethanol, 1% or 2% Bleach or Sodium Hypochlorite or using 0.5% sodium hypochlorite under 10 minutes. It also suggests that hand soap (about 2% in water) is also effective[3].

INDIA & COVID-19

The first case of COVID-19 in India was reported on 30th January, 2020 in Kerala, and a large number of cases were soon reported from all across the country. India was among the first countries to initiate a nationwide lockdown to contain the spread. Such measures were also taken to boost healthcare infrastructure in the country to successfully deal with a rising number of cases. Since currently there is no effective vaccine for COVID-19, guidelines were issued by both Central and State Governments related to social distancing, frequent handwashing, sanitization and wearing protective gear like gloves and masks to avoid contamination. People testing positive for the disease were required to self-isolate for a minimum period of 14 days, while people with severe symptoms needed to seek medical care immediately. A large number of facilities like Stadiums, Hotels, Guest House, and Railway coaches were converted into quarantine facilities to accommodate the growing number of cases and were equipped with beds, mobile washrooms, oxygen facilities etc.

At the time of writing this report, India stands 2nd in the world for the total number of cases while the first country being the United States of America. The total number of confirmed cases, as on 21st October, are 7,649,158. The number of active cases are 740,658 and deaths reported are 115,950[4].

BIO-MEDICAL WASTE: A GLOBAL CONCERN

Medical waste from hospitals needs to be handled carefully and improper treatment or disposal can lead to spread of infection as this waste stream has been directly linked with pathogens. In the times of COVID-19 pandemic, this concern is heightened because of the infectious nature of this disease. Even though there is a sharp decline in elective procedures and normal

[3] https://www.thelancet.com/journals/lanmic/article/PIIS2666-5247(20)30003-3/fulltext. Accessed 23 Sep. 2020.
[4] https://www.worldometers.info/coronavirus/?, last accessed on 21st October, 2020.

OPD services during lockdowns in the pandemic, the patient load is still high[5] because of the increase in the number of patients visiting Hospitals with COVID-19 symptoms on a daily basis. The increase in the number of COVID-19 cases also means surge in COVID waste. According to a United Nations Waste Management expert, before COVID-19 the amount of biomedical waste generated per bed per day globally was around 500 grams[6], but now it has shot up to between 2.4-4 kg per person per bed per day[7]. According to a report released by UNEP on COVID-19 Biomedical waste, it is estimated that that the increase of Healthcare waste from facilities associated with COVID-19 is 3.4 Kgs/bed/day[8].

A major change in this infectious waste stream is from the extra use of Personal protective gear required both for the Health care provider and the patient[9]. In light of evolving evidence, the WHO advised that governments should encourage the general public to wear masks where there is widespread transmission and physical distancing is difficult, such as on public transport, in shops or in other confined or crowded environments. This led to many Governments issuing guidelines keeping usage of masks as an effective strategy in combating COVID-19, resulting in a sudden increase in the usage of these masks. In order to curtail any chances of contamination and to contain the fear of contamination, disposable plastic products like gloves, face masks and PPE Kits are a necessity for most treatment facilities across the world[10], which further adds to the volumes of bio-medical waste already being generated. Another addition to the waste is the rapid testing kits that are also disposable in nature.

Increased volumes of infected waste generation will pose a serious challenge to governments since countries are at varying levels of preparedness and capacities to deal with the situation and provide necessary protection to their population and environment.

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[5] "Hospital surge capacity in a tertiary emergency referral center ...." 4 Apr. 2020, https://onlinelibrary.wiley.com/doi/full/10.1111/anae.15072. Accessed 17 Aug. 2020.
[6] "Health-care waste - World Health Organization." 8 Feb. 2018, https://www.who.int/news-room/fact-sheets/detail/health-care-waste. Accessed 17 Aug. 2020.
[7] "Hospital biomedical waste during Covid-19 increased by 5-6 ...." 11 Jul. 2020, https://www.counterview.net/2020/07/hospital-biomedical-waste-during-covid.html. Accessed 11 Aug. 2020.
[8] https://www.unenvironment.org/resources/report/waste-management-during-covid-19-pandemic-response-recovery#:~:text=A%20new%20publication%20%2D%20Waste%20Management,suspected%20cases%20of%20COVID%2D19.
[9] "Single use plastics are on the rise due to COVID-19 | World ...." 1 Jul. 2020, https://www.weforum.org/agenda/2020/07/plastic-waste-management-covid19-ppe/. Accessed 17 Aug. 2020.
[10] "COVID-19: A boomerang for the plastic industry? - India ...." 24 Jul. 2020, https://ibt.tpci.in/blogs/covid-19-a-boomerang-for-the-plastic-industry/. Accessed 17 Aug. 2020.

BIOMEDICAL WASTE AND COVID GUIDELINES

India has been engaging on the issue of biomedical waste since the last 22 years and has over the years developed sound infrastructure and systems to handle this waste. The Government of India first notified the BMW (Management and Handling) Rules in 1998 and have since amended the Rules in 2016. During the pandemic, the regulatory agencies issued additional guidelines under the Rules to ensure proper handling and disposal of this infectious waste.

COVID-19 Guidelines

The first guideline was issued by the Central Pollution Control Board on 19th March, 2020 on Handling, Treatment and Disposal of Waste generated during Treatment/diagnosis/Quarantine of COVID-19 patients. The guidelines and the subsequent revisions also listed norms for Isolation wards, Quarantine centres, Home care to ensure clarity, ease of understanding and better compliance. The revisions were mainly done because the ground situations were providing new challenges. The last guideline issued in July was mainly to improve segregation practices, thus improving overall effectiveness of the system and adopting best practices on infectious waste management as approved by the WHO and other agencies and suiting local requirements.

OBJECTIVES OF THE STUDY

- To understand the biomedical waste generation pattern during COVID-19 in Delhi
- To analyze impact of COVID 19 on Delhi's Regular Biomedical waste trend and its relation with COVID-19 waste trend, if any.
- To establish the effect of COVID-19 on Biomedical waste treatment capacity in Delhi

LIMITATION OF THE STUDY

The study was conducted during the months when the country was in the initial phases of UNLOCK, when many establishments were still not functioning and various restrictions were in place. It was difficult to get detailed information during those times. Though a number of newspaper articles mentioned illegal dumping of waste, which was seen as resulting from overburdening of CBWTF capacity in the state, these were unverified. Furthermore, another issue highlighted was worker safety in terms of absence of PPE or poor-quality PPE. The CPCB in its report mentioned that the non-segregation of waste has been a prime contributing factor, leading to huge amount of Yellow waste being generated. But whether the effect of guideline revision on the waste segregation at source is transient or permanent is yet to be seen. Toxics Link was unable to verify the ground situation due to ongoing COVID-19 pandemic and time constraints; thus they act as a limitation to the study, which is open to further research and assessment.

HEALTHCARE WASTE IN DELHI: DURING COVID-19

Delhi being both the administrative capital as well as the National capital of the country has a number of facilities catering to the public's health care needs. Delhi is home to the finest of healthcare setups in the country, from institutes like AIIMS and APOLLO running super specialty services, to Mohalla clinics, providing primary health care at the community's doorstep; all of them working to provide healthcare at all levels. All the healthcare facilities have a combined bed strength of around 57,000, spread over both public and private sectors. The Biomedical waste generated from all these facilities is serviced by the two Common Bio-medical Waste Treatment Facility (CBWTF) present in the city. These are SMS Water Grace BMW Ltd and Biotic Waste Ltd.

Ever since the COVID-19 pandemic broke out in the city, a number of quarantine facilities were set up to cater to the increased load of patients, in addition to certain hospitals in the city being designated as COVID Hospitals. The existing infrastructure of CBWTF was tasked to service these facilities for collection and disposal of COVID waste being generated by them. During the course of the Pandemic, the state Government also allowed isolation of COVID-19 patients in their homes (for those who can follow the isolation protocol and exhibited mild symptoms) and hence biomedical waste was being generated by such homes as well and were to be collected by the Municipal bodies and later transferred to these CBWTFs either directly or via Hospitals.

The division of COVID load among these two CBWTFs as on September is as follows-

1. **SMS Water Grace Pvt. Ltd**

Examination & Testing Centre	**113**
Home Quarantine (SDMC/EDMC)	**4**
Isolation Center	**7**
Quarantine Centre	**5**
Testing Lab	**8**
Hospital	**73**

2. **Biotic Waste Ltd.**

Hospitals	**61**
Quarantine Centers	**113**
Home Quarantines (North Delhi, South Delhi & New Delhi)	**3**

In Pre-COVID scenario, the two facilities were providing services to the following[11]-

Type	TOTAL	BIOTIC	SMS WATER GRACE
Total no. of health care facilities/occupiers	5394	2378	3016
Bedded facilities	1478	443	1035
Dispensaries	452	224	228
Veterinary	46	23	23
Animal houses	27	27	0
Pathological laboratories	1167	508	659
Blood banks (stand-alone)	11	5	6
Clinical Establishments	2169	1141	1028
Research Institutions	42	5	37
AYUSH	2	2	0
Total number of beds	50675*	22753	27922

**The above listed breakdown is as per the annual report information on Biomedical waste management scenario 2017 as submitted by DPCC and DGAFMS. This number keeps changing as new facilities are registered and tie-up with one of the two CBWTF facilities in Delhi. The current number of beds in Delhi stands at approximately 57,000 at the time of writing this report.*

BIOMEDICAL WASTE IN DELHI

During COVID TIMES

According to the Annual report on Biomedical waste (2018) by the Central Pollution Control Board, Delhi Pollution Control Committee (DPCC) reported a total 26757.5 Kg/day of biomedical waste generated in the State or approximately 800 tons per month in 2018. According to this report, 2 CBWTFs treat 98.37 % of waste generated in all districts, whereas 1.63 % of waste is treated in captive treatment facilities. According to information available, the two CBWTFs in Delhi, SMS Water Grace BMW Private Limited in Nilothi in west Delhi and Biotic Waste Solutions Private Limited in Jahangirpuri, have an operational capacity of 12 tons and 34 tons per day, respectively. SMS has an incineration Facility of 500 kg/hr.,

[11] http://toxicslink.org/docs/Spreading%20infection.pdf

Autoclaving Facility of 700 kg/Batch, Shredding Facility of 550 Kg/Hour, Effluent Treatment Plant (ETP) Capacity 100 KLD with zero discharge and Rainwater Harvesting facility. Facility has 34 owned GPS enabled vehicles for transportation of biomedical waste[12]. Biotic has 25 tons per day incineration capacity and 9 tons per day autoclave facility.

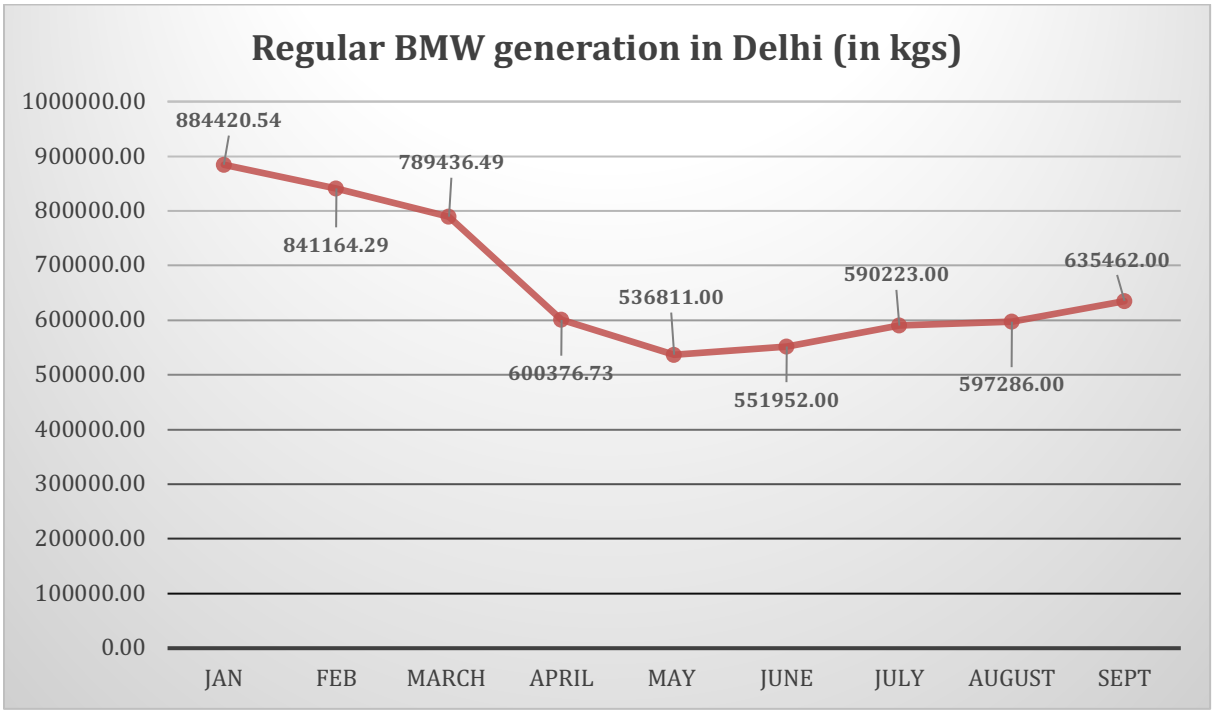
At a glance, the biomedical waste scenario in Delhi, as of 2018, was

Total no. of Bedded Health Care Facilities (HCFs)	1100
Total no. of Non-bedded Health Care Facilities (HCFs)	5329
Total no. Health Care Facilities (HCFs)	6429
Total no. of beds	54185
Total no. of HCFs applied for authorization	1002
Total no. of HCFs granted authorization	818
Total no. of HCFs in operation without authorization	2110
Total quantity of BMW generated (kg/day)	26757.5
Total quantity of BMW treated and disposed (kg/day)	26757.5
Total no. of violation	413

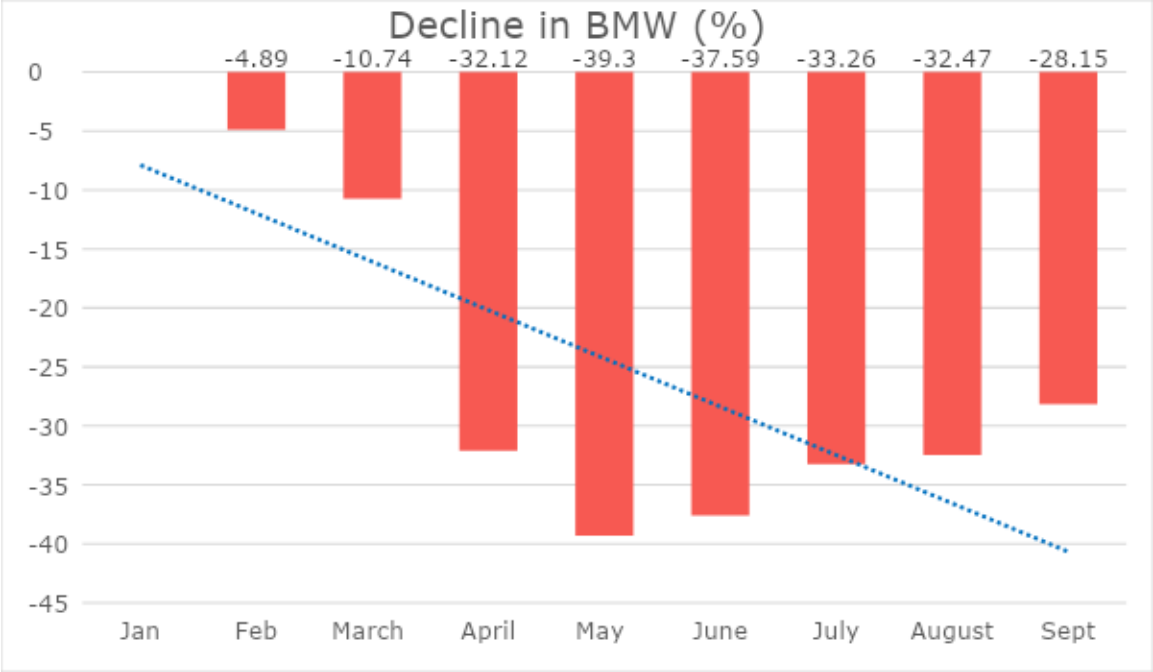
The data on waste accessed by Toxics link shows that the biomedical generation pattern has changed during the COVID times. As per data collected from both the CBWTFs, a total of 6026 tons of regular biomedical waste (COVID Waste not included) has been generated in the city since the beginning of this year (January- September, 2020). The month wise breakdown of regular biomedical waste is shown in the graph below. In January 2020, before the pandemic started, the average waste generation per day was 28-29 tons, almost in tune to what was reported in the CPCB 2018 annual report. But the important thing to note is that the average waste generation per day showed a slight dip in the month of February, which can be attributed to seasonal variations. During the month of March, when COVID cases began to be reported from all across the country, the Government of India took a decision to implement nationwide lockdown from the midnight of 25th March 2020, leading to immediate shutting down of Schools, Colleges, Entertainment zones, majority offices (barring those termed as essential services), travel (both domestic and International) etc. Such widespread restriction in movement of any sorts also resulted in temporarily shutting all non-essential hospital admissions, elective surgeries and follow up visits. This led to a continuous drop in waste during the COVID peak months, drastically coming down to almost 18 tons approximately in

[12] http://smsdelhibmw.co.in/about-us/

the month of May which is incidentally almost the peak of COVID infections and also the period of stringent lockdown in Delhi. During the lockdown, most OPDs were closed as hospital reserved bed space and workforce for the COVID-19 cases, resulting in a drop in elective procedures and surgeries as well, which is most likely the reason for this drop in BMW generation. The unlocking in India started in June and a careful look at the graph below clearly indicates that the BMW generation also started to gradually rise post June.



In January & February while there were no COVID cases, all the biomedical waste was in the undivided regular biomedical waste category. If we consider the January data as the benchmark to see the percentage decline in BMW generation, we find that there is a sharp decline in the month of April (first month with full lockdown, as lockdown started in the last week of March). The maximum dip is in the month of May, at almost 40% decrease from the base of January. From June (the first unlocking unannounced) we see an upward trend in generation of BMW, though it is still at -28.15% dip in the month of September.



Thus, it can be said that while COVID cases increased during the months from March to May, the regular (Non-COVID) biomedical waste generation decreased. However, as the Government announced UNLOCK strategies from June onwards, the regular biomedical waste also began to rise gradually and is on continuous rise since June. Changing trend in regular BMW through these months has been observed by both the CBWTFs, indicating that the change was throughout Delhi.

Major changes observed in regular biomedical waste trends are:

- *Number of cases began to be reported in March, thus leading to a Lockdown, causing decline regularly in biomedical waste.*
- *Sharp dip was seen in April. (31.5% ↓) and May.*
- *Since UNLOCK in June, biomedical waste is also increasing gradually at a pace of 3-7%.*

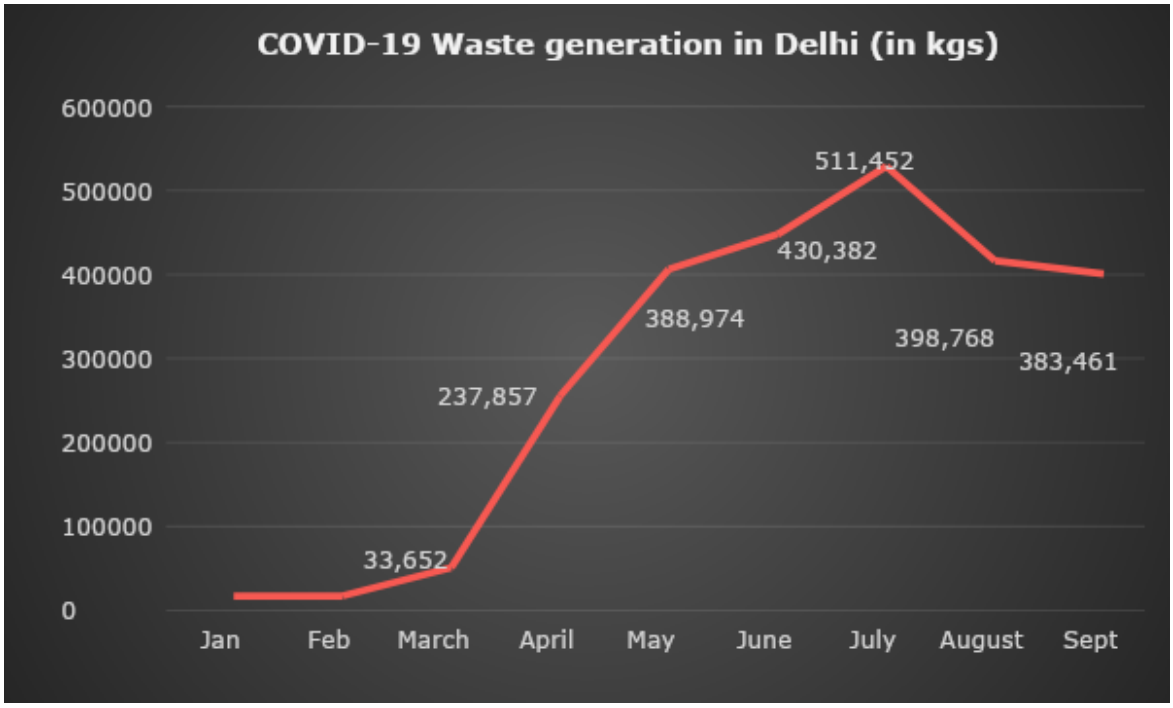
COVID-19 WASTE

Healthcare, Quarantine and Home Isolations

As cases began to get reported in March, a new term was coined, called the 'COVID-19 waste', to identify the waste generating out of COVID-19 wards in Hospitals and from testing labs, quarantine centers and homes as well related to COVID patients. As the concerns related to COVID-19 waste started mounting, guidelines were issued under Biomedical Waste Rules. This waste was to be marked, collected and disposed of in a separate way. As in January and February, there were no reported cases of COVID cases in Delhi and also there were no

guidelines to separately mark COVID-19 waste, these months show COVID waste generation at zero.

From March onwards, as the cases got reported, COVID-19 waste generation started. From March to April, there was a drastic jump in COVID cases in the city, reaching from 440 cases in March to 3515 cases in April. The COVID related waste generation also increased from 33 tons in March to 238 tons in April registering a hike of 620%. Apart from an increase in the number of cases, the primary reason for this exponential increase in the quantum of COVID-19 waste was the first guideline issued by the CPCB stating that all the waste generated by COVID-19 patients was to be separated and incinerated. This also included recyclable items, disposable plastics, food items etc., as the virus was relatively new and there was little knowledge about its nature and properties at that point of time.



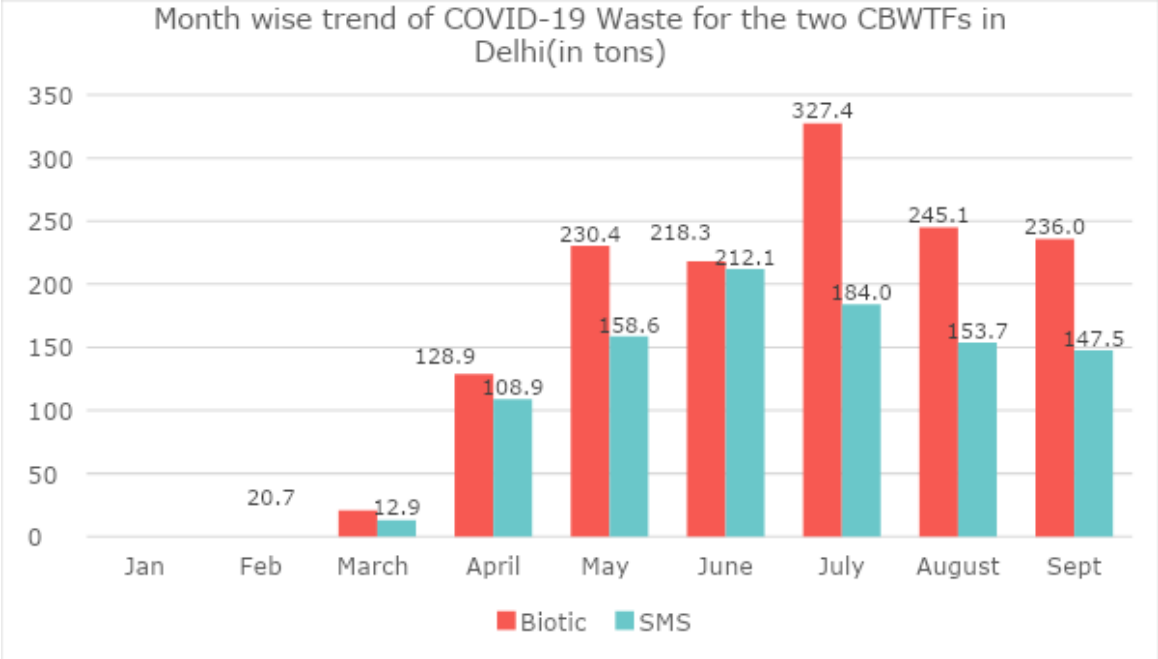
The high volumes of waste being incinerated was bringing about other significant concerns. With the capacity of incinerators available in the two CBWTF in Delhi fixed, the increased incinerable waste meant excessive loading of the capacity. Incomplete burning of such unsegregated waste could also lead to release of Dioxins & Furans which are established carcinogens.

The COVID waste continued to increase throughout the month of May, June and July where it reached its highest peak of 511 tons. This can be attributed to the fact that till July, the major problems faced by the CBWTFs was mixing of the general household waste along with the

biomedical waste and hence huge increase in the total quantities. Similar cases were reported from all throughout the country where CBWTFs complained of mixing of general household waste, including packaging paper, leftover food items, utensils along with biomedical waste. According to information from IMAGE, the sole CBWTF in Kerala, though an increase in the number of cases in the first few months is one cause of increase in the amount of waste, other major contributing factors were improper segregation of waste at source along with mixing of non- Biomedical waste with Bio medical waste. It has also led to high plastic content waste with high calorific value getting incinerated causing environmental issues. While regular biomedical waste has a calorific value of 3000-4000 Kcal, it now increased to 8,000-9,000 Kcal leading to tremendous heat generation, decrease in quality of incineration and increase in amount of particulate matter released which is also choking the air pollution control devices of the CBWTF. This has also led to high repair and maintenance cost of the Incinerators. In the case of Delhi, it is important to note that the government supported home quarantine for people with mild to moderate COVID symptoms, which led to a substantial amount of COVID waste being generated from homes as well, thus leading to more mixing of COVID waste with household waste.

The fourth revision (latest guideline being followed) of COVID-19 waste guidelines in July, stressed on recycling of certain medical waste and less usage of disposable items. It also clearly issued a mandate where, household waste including left over foods, cutlery, food packaging, etc.) were not to be treated as yellow waste(incinerable) and be disposed of as general municipal waste. It also clearly specified the items that were to be treated as COVID waste. This step helped in bringing down the COVID related waste generation. While the number of cases continue to rise in July & August, the COVID waste went down from 511 tons in July to 398 and 383 tons in August & September respectively, registering an average dip of 23.5%. A total of 2384 tons of COVID waste has been generated from Delhi since the onset of the pandemic.

Both the facilities in Delhi showed a similar trend on COVID-19 waste generation, the only difference was in the peaking of waste quantities. Though Biotic received the maximum amount of COVID-19 waste in July, SMS had the peak in the month of June. The CBWTFs were collecting COVID waste from not just the healthcare facilities but also from quarantine centres as well as isolation centres. In some cases, municipalities were collecting from households and then depositing it to the CBWTF facility directly, and in other cases this was being routed through some select hospitals. One of the facilities in Delhi shared that the volumes from households went up to 3-4 tons daily during the peak months, but has come down now to barely a kg or so.



Major changes observed in COVID biomedical waste trends are:

- *COVID waste generation began in March and showed a huge spike of 620% between March to April*
- *Highest peak of COVID waste till now, observed in July at 511 tons*
- *23.5% dip registered post July during the months of August & September in COVID waste*
- *Major reason cited for huge amount of waste for non-segregation of waste at source/ mixing of household waste with biomedical waste*

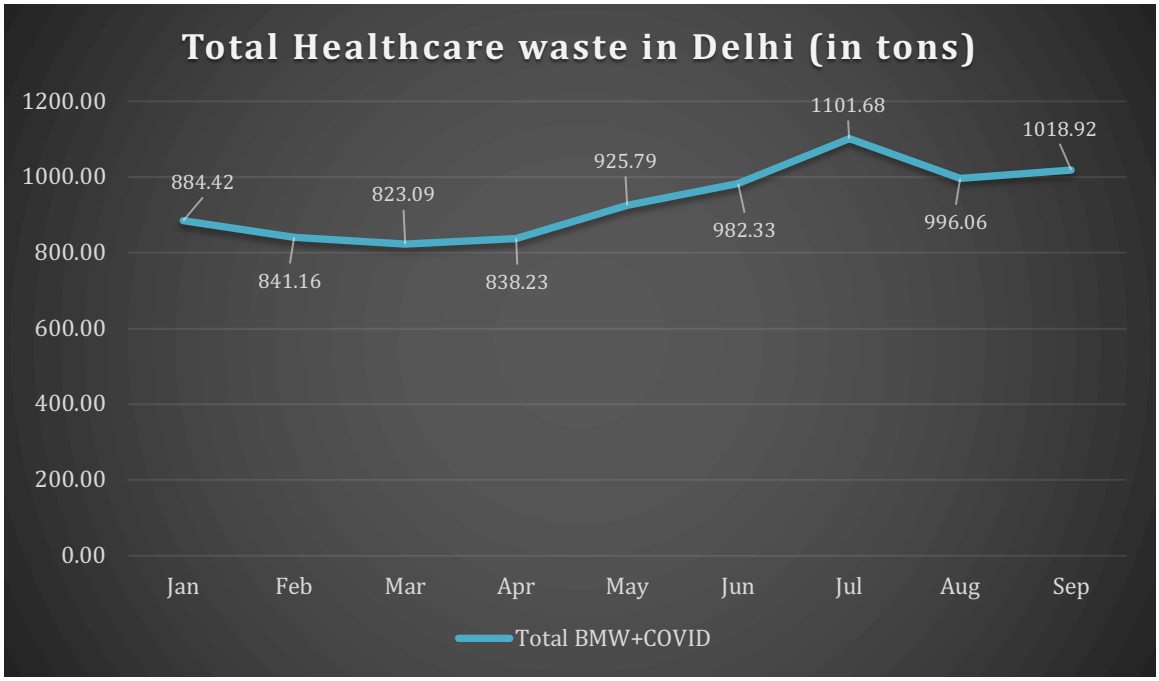
HEALTHCARE WASTE IN DELHI

During COVID times

The mounting COVID-19 waste has raised an alarm and question through the country about whether the country has sufficient capacity or infrastructure to deal with it. Reports regarding dumping of bio medical waste in unauthorized manner have been reported throughout the country and also in Delhi, prompting regulatory agencies to look at the guidelines more closely and also prompting the judiciary to issue orders. Hence it becomes important to understand the concerns and the possible solutions.

As per the data received from the two CBWTFs operating in Delhi, the total biomedical waste generation in the first two months (January & February) had only regular biomedical waste

and the data from March to September shows both the regular biomedical waste and COVID-19 waste.



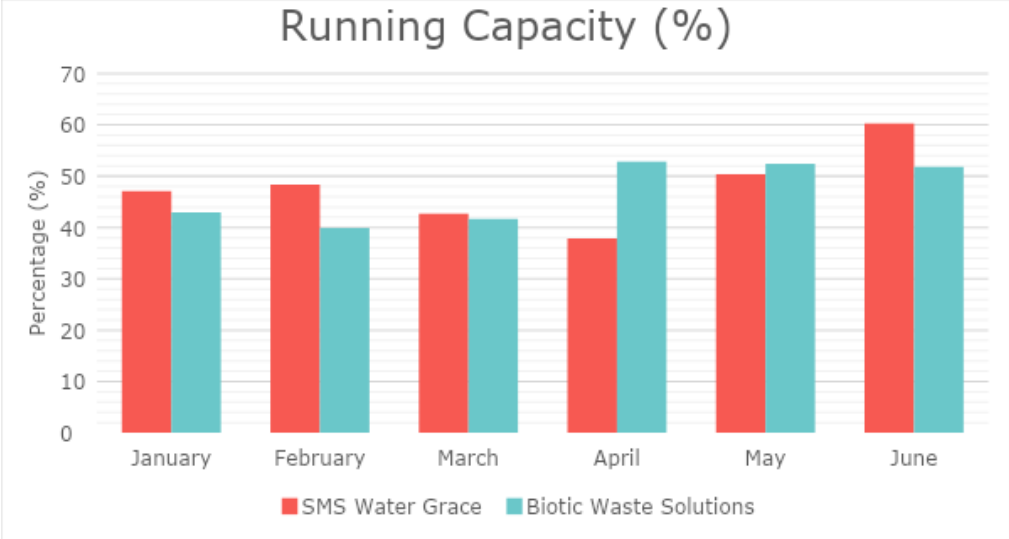
From the information available to us, it appears the biomedical waste situation in Delhi has not witnessed any major change in terms of the quantities. The general BMW waste generation in Delhi during each of the months of Jan & Feb was above the 800-ton mark, which did not rise during March and April. In fact, the total quantities went down in March and April. This could be contributed to complete lockdown during these months. From May onwards, the total BMW went above the non-COVID months. In May, the generation increased to 926 tons, which is almost 5 percent higher than January. The waste quantities see a major jump in the months of June and July; the increase to the tune of 11% and 25% respectively in comparison to January. The rise in waste quantum post June could be attributed to the fact that these months saw unlocking process, but the cases of COVID-19 were still on the rise. UNLOCK phases led to more people moving out for work and business thus, increasing the chances of infection and also normal hospital visits started resuming. Though there is a small dip in the month of August, the quantities again increased in September.

The total biomedical waste generation peaked in July with 1101 tons, which can be attributed to three major factors-

- *Increasing number of positive cases*
- *Non-segregation of waste*
- *Resumption of normal activities*

The revision of guideline specifying clear segregation rules in July led to a decrease in amount of biomedical waste generated in August & September, though it is still roughly 150-200 tons more than pre-COVID levels, which can be attributed to opening of most, regular clinical services and a continuous rise in new patients being tested COVID positive.

The usage percentage of running capacity of both the CBWTFs is mentioned in the graph below. The figure clearly shows that both the plants have sufficient capacity to deal with the total biomedical waste generated in the city, including both the regular BMW and the COVID BMW. In the month of June, when the COVID-19 waste peaked in the city, the facilities were still using only around 50-60% of their capacity. According to the director of Biotic waste Ltd up till September, Biotic on an average had used 50% of its treatment capacity, thus highlighting the fact that the facility had sufficient capacity to manage the amount of waste being generated in Delhi.



Major changes observed in COVID biomedical waste trends are:

- *Total Biomedical waste generation increased by 12% between March to April.*
- *Highest peak of total biomedical waste in July of 1101 tons which is an increase of 31% from pre-COVID levels waste generation of 840 tons in February and 25% from January.*

Waste trend Analysis on the basis of Category of Waste

Since the issuing of guidelines in March, there has been a debate on the categorization of COVID related waste. All the revisions in CPCB guideline had waste segregation at its core, adding or subtracting different types of wastes from different categories as knowledge among the scientific community and the government increased regarding the nature of the virus. The

two main categories of waste highlighted during COVID times are the Yellow (Incinerable) and Red (Recyclable) waste category.

Yellow (Incinerable) Waste

The increased amount of yellow category waste during the initial months of COVID had been a cause of concern, as it was overwhelming the capacities of Incinerators to overwhelm in many parts of the country. The CPCB in its report to the Hon'ble National Green Tribunal, on basis of data collected from all states in the country up to May 2020, clearly highlighted certain states where 70% or more of the capacity of incinerators had been utilized and guided the states to look for backup/ standby options[13].

Thus, as per data obtained for Delhi from both the CBWTFs, it can be clearly seen that though yellow category waste was on steady rise since March onwards, and peaked in May due to the high number of cases, it started dropping down gradually post July. This is quite clearly due to the revised guidelines and the mandate to not put everything in the yellow category. It grew from 32 tons in March to 219 tons in April and 372 tons in May, showing an increase of 1062% in 2 months. Delhi reported more than 75% of its total cases in June as curbs of the lockdown were eased, which is probably the reason for the high quantities in June as well. Following the month of July, when guidelines were revised, the number of new cases went down and there were increased rates of recoveries, there has been a decreasing trend in yellow waste showing a dip from 363 tons in July to 230 tons in September highlighting a decline of 36.6% in yellow category waste.

13 https://greentribunal.gov.in/sites/default/files/news_updates/Status%20Report%20in%20O.A%20No.%2072%20of%202020.pdf

MANAGING BMW AND COVID WASTE

The Real Problem

During the COVID-19 peak, there was a heightened concern raised in India regarding inadequate infrastructure to handle the waste generated by the COVID-19 patients. The concern was about multiple generation points as well as the increased volumes. There were cases being reported in the media all over India, also in Delhi, regarding illegal dumping of this waste along with municipal waste.

A detailed look at the waste generation, as shown above, clearly indicates that the total volume of waste did not really go up substantially in the initial months of COVID or the period when the country was in full lockdown. So, the concern in those months were more from the fact that the incinerable waste had gone up and also because all kinds of waste were being put in this category. Even during those periods, the waste generation was much below the capacity of the two CBWTFs and both the facilities were running only to around 50-60 of their capacity. The revised guidelines by CPCB in July, gave clear instructions that segregation had to be followed and everything was not required to be incinerated. This resulted in the incinerable waste coming down substantially.

In the current stage, when the lockdown has been lifted to a large instance and the number of cases is still on the rise, the waste volume is quite high. Even with better segregation guidelines, the large number of cases is resulting in substantial amounts of COVID waste. And with the Unlocking, people have resumed normal medical procedures which has resulted in the normal Bio medical waste going back to its normal generation rate. Hence the total amount, including COVID waste, is much higher than the BMW generated during non-COVID months. Though currently, it is still within the handling capacity of the two CPWTFs, it will need to be seen whether, with the continuing increase of COVID cases, the capacity is overwhelmed.