

**COVID-19 Pandemic Pushes Single Use Plastic Waste
Outbreak: No Management, No Protection: High Health
and Environmental Risk Unveil**



14,165 tons plastic
waste in a month

COVID-19



"Dhaka has spawned
some 3076 tons of masks,
hand gloves, polybags
single use plastics waste
in ever first month of
COVID-19
community spreading"



COVID-19 Pandemic Pushes Single Use Plastic Waste Outbreak: No Management, No Protection: High Health and Environmental Risk Unveil

At the end of the very first month of the official lockdown to prevent COVID-19 spread in Bangladesh, about 14500 tons of hazardous plastic waste has emerged from the dramatically increased use of single use surgical face masks, hand gloves, hand sanitizers and polythene bags in communities and health care facilities, a recent study by ESDO reveals.



Study conducted by:

Environment and Social Development Organization-ESDO Research Team

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#break
free
from
plastic



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COVID-19 Pandemic Pushes Single Use Plastic Waste Outbreak: No Management, No Protection: High Health and Environmental Risk Unveil

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This report is published for current information and represents the current scenario of hazardous single use plastic waste generation in the wake of COVID-19 pandemic in Bangladesh. Environment and Social Development Organization- ESDO holds the copyright of the report “COVID-19 Pandemic Pushes Single Use Plastic Waste Outbreak: No Management, No Protection: High Health and Environmental Risk Unveil” and the report is validated under the support of Plastic Solution Fund and #BreakFreeFromPlastic-BFFP and others national and global partners.

We appreciate further comments and feedback from our readers and supporters and all individuals.

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May, 2020,
Dhaka, Bangladesh

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1. Executive Summary

At the end of the very first month of the official lockdown to prevent COVID-19 spread in Bangladesh, about 14500 tons of hazardous plastic waste has emerged from the dramatically increased use of single use surgical face masks, hand gloves, hand sanitizers and polythene bags in communities and health care facilities, a recent study by ESDO reveals. About 11.2% of this waste apparently comes from the use of surgical face masks, 21.5% from polythene made normal hand gloves, 20% from surgical hand gloves, 40.9% from the single use polythene shopping bags used for carrying food items and 6.4% from empty containers of hand sanitizers. ESDO has recently conducted a study on single use plastic waste generation at the advent of coronavirus pandemic in Bangladesh. The study surveyed over 1700 and interview with more than 571 individuals from different stakeholder groups by means of different long-distance communication including online (e-mail), SMS surveys and telephone interviews. The research has portrayed country's hazardous plastic waste generation scenario in the first month of the official lockdown phase extending from 26th March, 2020 to 25th April, 2020.

Inevitable use of single use plastics at community and household level has augmented many folds since the outbreak of the deadly coronavirus disease in Bangladesh. The use of polythene and plastic shopping bags at community level has been growing at an unprecedented rate than ever. Besides, use of personal protective equipment (including face masks and hand gloves) as part of individual awareness has become common among all levels of community people, which are in many of the cases made up of plastics.



ESDO's new study findings indicate that, most dominant kind of single use plastics, the usage of which have been experiencing unprecedented rise since COVID-19 emergence in Bangladesh includes – surgical face masks, hand gloves (surgical/normal polythene made gloves), polythene shopping bags and hand sanitizer containers.

About 85% of the population in Bangladesh are using some sort of masks but not all of them are single-use surgical face masks. A great majority have been using cloth masks. Nearly 23% of the entire population are currently using single-use surgical face masks of whom 20% are based in the urban locations and the rest 3% are based in rural areas. An estimated 455 million surgical masks have been used by the entire population during the last one month giving rise to an estimated 1592 tons of disposable plastic waste. In the capital city of Dhaka, the rate of use of surgical face masks are relatively higher compared to other urban areas. About 35% of the people, currently residing in Dhaka, are using surgical masks on regular basis while going outside accounting for about 28% of the entire generation.

During the time of COVID-19 spread, growing tendency of using disposable hand gloves has become evident both in urban and rural areas of Bangladesh. Two different kinds of hand gloves are being used by people – polythene made hand gloves and surgical hand gloves. The use of surgical hand gloves is evident in some of the major cities of the country (including Dhaka, Chittagong, Sylhet, Rangpur, Gazipur and Narayanganj) while people in most of the districts have preferably adopted the use of polythene made lightweight hand gloves. Current study suggests that, around 30% of the entire population in Bangladesh have adopted the use of polythene made hand gloves while dealing with outdoor activities. Majority of this population are based in urban areas (25%). City dwellers and street vendors in urban areas are, apparently, the major users of single-use hand gloves made up of polythene. Alone from this source, an aggregated 1216 million gloves have been disposed by the population in the last one month referring to the generation of an estimated 3039 ton of disposable plastic. Of this, nearly 20% emerged from the capital city alone. An average 9% of the population around the county has also been found to be using relatively heavy weight surgical hand gloves.

Polythene shopping bag has been identified as the largest source of single use plastic waste generation in Bangladesh during the ongoing COVID-19 response phase accounting for about 5796 ton of plastic waste in a single month. Use of banded polythene has increased many folds in communities as people tend to buy food items in polythene covers to protect them against infection.

Apart from regular household use, polythene is being largely used for relief distribution and takeaway food packaging purposes as well. Alone in Dhaka, around 443 tons of plastic waste has been estimated to be generated from the use of polythene shopping bags in communities and distribution of relief items among the poor and the distressed in polythene packets.

Besides, surgical masks, hand gloves and polythene bags, containers of hand sanitizers, that are being massively used in the current context are also generating certain amount of single use plastics. Research findings suggest that, around 30% of the total populations use hand sanitizers in Bangladesh mostly in urban locations. The empty containers of the hand sanitizers reportedly contributed around 900 tons/month in the COVID-19 generated single use (onetime) plastic waste stream.

Health care facilities (hospitals, medical care centers) has been identified to be one of the major sources of infectious or hazardous plastic waste generation during COVID-19 response. Experts opine, the doctors and nurses in dedicated COVID-19 hospitals, who came in close contact with COVID-19 infected and suspected patients during the last one month had to frequently use and dispose surgical masks and gloves, along with other personal protective equipment. However, doctors in general hospitals have also been using masks and hand gloves as part of extended precautions. All these has supposedly resulted in the generation of an estimated 250 tons of single use plastic arising from the hospitals during the last one month solely from the use of surgical masks and gloves by health professionals. However, sample testing pathological laboratories dedicated for COVID-19 testing has generated an additional 1.1 ton of singles use plastic waste.

Improper disposal of hazardous COVID-19 plastic waste can cause massive pollution of environmental components including soil, water and air. Medical waste is particularly difficult to handle as it is a mix of both wet and dry waste, is highly contagious. When a high volume of medical wastes gets generated within short time interval it becomes often impossible to segregate the waste and treat them before sending them to landfill or to incinerate. As bulk quantity of highly contagious medical waste (a great majority of which are plastics) are incinerated in normal incineration facilities, it causes the release of highly toxic gases, fumes, heavy metals and contagious airborne substances as well severely affecting the nearby air quality. If the contaminated wastes are directly dumped into the landfills without treatment, the infectious substances may get mixed with the soil and rainwater and ultimately get carried away to water bodies and groundwater as toxic leachates.

These chemicals are absorbed by plants which are later utilized by other organisms including humans which as a result can cause disease or even death. Improper waste disposal can also interfere with the food supply as plant growth is impaired reducing the amount of food produced.

Waste collectors get directly exposed to hazardous plastic wastes during collection, handling and transportation of infectious wastes from sources to storage facilities. Discarded masks, gloves and other PPE could be potential sources for the spread of this highly contagious virus. As the virus can survive and remain active up to several days on plastic surfaces, when the discarded plastic wastes are collected or handled by waste collectors or personnel in waste management facilities without taking protective measures, it may get them infected. Informal waste collectors in Dhaka are working without adequate protection with heightened risk of getting infection from hazardous wastes. An estimated 6000 plus informal waste collectors are associated with the municipal waste collection and management process alone in Dhaka. But after the coronavirus outbreak, most of them are absent from the work or have self-withdrawn from this work due to persisting lockdown.

2. Statement of the Problem

Coronavirus disease 2019 (COVID-19) is a respiratory tract infection caused by a newly emergent coronavirus, SARS-CoV-2, that was first recognized in Wuhan, China, in December 2019. Genetic sequencing of the virus suggests that SARS-CoV-2 is a beta coronavirus closely linked to the SARS virus. The case fatality ratio for COVID-19 has been much lower than SARS of 2003,[16][17] but the transmission has been significantly greater, with a significant total death toll.[18][16] The 2019–20 coronavirus pandemic was confirmed to have spread to Bangladesh on March 2020. The first three known cases were reported on 7 March 2020 by the country's epidemiology institute IEDCR. Infections stayed low till the mid of March but saw a steep rise during the last week of March and first week of April¹. In the week ending 11 April, new cases in Bangladesh grew 1,155 percent, the highest in Asia, ahead of Indonesia with 186 percent².

As the coronavirus outbreak expands globally, there is increasing concern about how to deal with waste arising from quarantined households, potentially infectious patients, the staff caring for them and medical laboratories. A higher pressure on the health systems is leading to higher quantities of medical waste, especially infectious wastes being generated.

¹ 20-fold rise in Covid-19 cases in Bangladesh since April 1, Dhaka Tribune, 14 April 2020.

² Mint Covid Tracker: India's corona trajectory has tapered this week but still remains steeper than Asian peers, livemint, 11 April 2020.

Many types of additional medical and hazardous waste are generated, including infected masks, gloves, plastic gloves, polyethene and other protective equipment during this outbreak. China's Wuhan, the first of the cities that got viciously brutalized by the pandemic, is the home to 11 million people. Its hospitals produced more than 240 tons of medical waste daily during the peak of the outbreak compared with 40 tons before the epidemic occurred, according to China's Ministry of Ecology and Environment's emergency office³. Besides, the global demand for certain uses of plastics has also increased due to the coronavirus. The polymers polypropylene, used in lifesaving medical equipment such as N-95 masks and in takeout food packaging, polyethylene used in protective suits, and PET in single-use plastic water bottles and medical face shields have all seen a rise in demand as the COVID-19 pandemic plays out⁴.

Bangladesh faces significant challenges in combating COVID-19 as it is a densely populated country. Hazardous waste management mechanism in the country is also not well developed making it prone to encounter difficulties regarding the proper handling and management of infectious or hazardous waste generated during the ongoing crisis period. Improper management of these wastes could cause adverse effects on human health and the environment. The safe handling and final disposal of this waste is therefore a vital element in an effective emergency response.

3. Purpose and Need of the Study

According to International dangerous goods regulations, COVID-19 is classified as a Category B Infectious Substance and it is regulated as a hazardous material because of its capability of posing an unreasonable and uncertain risk to health, safety, and property. Bio hazardous COVID-19 waste generated from hospitals, healthcare facilities, and quarantine sites (personal protective equipment e.g. gloves, masks, gowns; sharps, glassware, hand sanitizer or any materials that have come in contact with coronavirus) need stringent and proper handling, collection, separation, packaging, storage, transportation, treatment and disposal methods⁵. For the Management of hazardous or infectious plastic waste, adequate information on the baseline situation is a pre-requisite. The study aimed at providing an insight to the contemporary plastic waste generation scenario in Bangladesh, discuss the potential health and environmental impacts of the same and create urge for the adoption of appropriate waste management strategy for the safe management

³ <http://unb.com.bd/category/Special/amid-covid-19-pandemic-biomedical-waste-turning-more-hazardous/49165>

⁴ <https://www.forbes.com/sites/thebakersinstitute/2020/04/14/pandemic-plastics-and-the-continuing-quest-for-sustainability/#1a2fc40a77b4>

⁵ <https://oceanconservancy.org/blog/2020/04/16/know-dont-know-plastics-coronavirus-pandemic/>

of infectious plastic waste generated during COVID-19 outbreak. This study will serve as a key document to the policy makers and field professionals in assessing plastic waste generation scenario and identify the appropriate strategy to arrange for adequate and appropriate management of hazardous wastes, particularly the plastic wastes generated during COVID-19 pandemic. However, the study also emphasizes the need for providing adequate protection to the informal waste pickers and cleaners who have been providing relentless service in maintaining cleanliness in view of the greater public health interest.

4. Methodology

The study aimed at a quick assessment of the hazardous plastic waste generation and management scenario in the wake of the COVID-19 pandemic in Bangladesh. As per the defined research framework, supposedly preferable and most suitable methods for the study would have been field survey and other primary data collection methods. However, owing to the ongoing emergency situation and the month-long persistent lockdown condition in Bangladesh, the research team was unable to conduct field surveys and collect data from first hand sources. As alternatives, they adopted supplementary data collection measures.

The methods employed for this particular research includes – data collection from credible secondary sources or literatures by means of extensive desk study, online surveys, SMS and telephone interviews of respondents from different stakeholder groups. We have conducted telephone/cell phone interview with 571 people from 61 Districts of 6 regions of Bangladesh to collect empirical/observed information, from journalists, doctors, nurses, health professionals, administrative service professionals, police, on duty other officials, NGO workers and general public and cleaners/waste collectors. Amongst them 537 individuals help and volunteer to conducted questioner (5 questions) survey and reach out 1727 samples in a month.

For online survey, a well-structured questionnaire was prepared in Google doc. format including queries over the research concerns and was forwarded to key personnel in relevant fields. For telephone interviews, semi-structured questionnaire was used. Findings from online surveys, sms and telephone interviews were then analyzed and subsequently backed up by available online literatures to generate the final outcomes.

Perceived reality of COVID-19 waste mix-up with other plastic waste



This photo was taken from Motijheel, on 26 March, 2020 morning. Photo by: Sk EnamulHaq/ Daily Star

5. Major Findings

5.1 Hazardous Plastic Wastes generated during COVID -19 Response: Types & Sources

5.1.1 Plastic Waste emerged from Households and communities:

Since the pandemic COVID-19 has commenced, use of plastic has risen at community and household level around the world. Bangladesh is not an exception. As part of health regulations, individuals are promptly advised and urged by the government to use disposable masks as they go outside to protect themselves against the infections. Specific portions of the population have been found to be abiding by the rules and using disposable masks on regular basis. However, this good practice has escalated the concern over a bulk amount of single use plastic masks to be included into the municipal wastes. Apart from masks, use of personal protective equipment, hand gloves have also become popular among general public. In addition, increased used of sanitizers and disinfectants in households has resulted in wastes generated from the empty containers of these materials.

Other than individual protection and safety, people in Bangladesh are also using increasing amount of single use polythene bags for shopping during the COVID-19 lockdown phase.

There has been growing tendency of using disposable plastics as safe options in lieu of reusable carrier bags or container among the general public in fear of accumulation of the deadly viruses upon the reusable items. People are using polythene bags more than ever. Demand for takeaway foods and food delivery services have increased many folds. Rate of online shopping has also soared high during the past one month. All these services tend to use plastic wrapping for hygiene and sanitary purpose resulting in increasing amount of plastic waste generation.

5.1.2 Plastic Wastes emerged from Health Care facilities:

Healthcare facilities including sample testing laboratories, hospitals and medical centers have become one of the major sources of hazardous plastic waste generation amid the pandemic COVID-19 outbreak. Garbage contaminated with bodily fluids or other infectious materials is becoming a bigger concern for the hospitals treating the corona virus patients as they brace for a surge in patients sick with COVID-19. Patients as well as the health care workers are in extreme need of medical supplies and disposable personal protective equipment, made mostly of single-use plastics, like masks and gloves. Eventually all the used plastic item piles up as medical waste that needs to be safely discarded. Infectious medical waste is being generated in 3 major healthcare arrangements:

Sample Collection and Testing Laboratories:

33 hi-tech biomedical laboratories are functional around the country to conduct COVID-19 tests⁶. These laboratories had combinedly conducted tests of around 2100 samples per day on an average during the first month of COVID-19 spread in Bangladesh. Both the sample collection process as well as the standard testing procedure demands the use of plastic materials like – PPE (including masks, gloves, gowns, protective shields etc.) of the health workers dealing with sample collection and testing, plastics and polythene used in testing kits and collection containers, disinfectant and sanitizer containers, polythene wrappers used for safety purposes in sample collection centers etc.

As per the standard protocols issued for sample collection and testing, the medical personnel in laboratories have to be well equipped with appropriate protective equipment that are mostly made up of single use disposable plastics and the samples are to be handled properly with extra precautions to avoid any kind of leakage or release and hence use of polythene or plastics are preferably used by these facilities.

⁶ https://corona.gov.bd/?gclid=EAIaIQobChMlh7eqvme6QIVFyUrCh0Pxl_EAAYASAAEgINUPD_BwE

Dedicated Hospitals/ Treatment Centers

So far, more than 60 hospitals (comprising of both government and non-government facilities) have been prepared to dedicatedly provide treatment to the COVID-19 patients in Bangladesh.

These hospitals are generating bulk amount of medical wastes per day mostly comprising of single use plastic items such as surgical face masks and hand gloves since the last one month. The plastic waste generated in hospitals mostly come from the PPE used by the doctors, nurses and health workers as well as by the infected patients, saline tubes, plastic containers of sanitizers, disinfectants, tissues and often the plastic covers or oxygen hoods used in isolation wards and ICUs. Reportedly, these wastes have seen an unprecedented rise in the hospitals since the past one month.

Institutional quarantine centers

Institutional quarantine centers are being operated throughout the country in which suspected coronavirus patients are kept quarantined. These quarantine centers also produce infectious medical wastes on regular basis including masks, gloves used by the patients and the health workers who are in charge of the centers, containers of sanitizing materials, double layered protective plastic garbage bags etc.

5.2 Hazardous Plastic Waste Generation Scenario in Bangladesh:

5.2.1 Household and Community level

Inevitable uses of single use plastics at community and household level has augmented many folds since the outbreak of the deadly coronavirus disease spreading around the world. Similar is the case in Bangladesh, where the use of polythene and plastic shopping bags at community level has been growing at an unprecedented rate than ever. Besides, use of personal protective equipment (such as surgical face masks and gloves made up of single use plastics in most cases) as part of individual awareness has become common among all levels of the community people. ESDO's new study findings indicate that, the most dominant kind of single use plastics, the usage of which have been experiencing unprecedented rise since the COVID-19 outbreak in Bangladesh includes – surgical face masks, hand gloves (surgical/normal polythene made gloves) polythene shopping bags. Besides that, use of hand sanitizers have also risen and their empty containers adds up significant amount to the plastic waste stream. ESDO's study aimed at estimating the generation of hazardous plastic waste from these generic sources during the first month of intensive COVID-19 response in Bangladesh. The calculation has integrated considerations from 26th March 2020 up to 25th of April 2020.



Figure: Single use plastic items considered for this respective study (from Right- surgical face masks, hand gloves, polythene shopping bag and hand sanitizer container)

✚ Use of Surgical Face Masks

COVID-19 infection is mostly believed to be spread by the respiratory droplets of the infected patients and hence, the most probable means of virus invasion into the human body is through inhalation. This information has been widely spread by government and non-government organizations throughout the entire nation by means of various awareness raising programs. As a result, the rate of use of masks by individuals as personal protective equipment is relatively satisfactory in Bangladesh. This study found that, 85% of the population residing in urban areas of the country are currently using some sort of masks either consciously or subconsciously whereas, the rate is about 60% for rural areas implying towards greater public awareness. However, another side of the coin portrays a different reality. Majority of the population (more than 50%) are using the masks in an improper manner being completely unaware of the hygiene and safety concerns and adopting the practice just to keep pace with the ongoing trend. They tend to use one mask, that are actually recommended to be dumped after single use, for several times. In most of the cases, they have been found not to be aware of the appropriate methods of dumping such infectious or hazardous single use substances and thus giving rise to the risks of virus spread.



Figure: Use of Surgical face Masks by Community People in Bangladesh

A great majority of the population (particularly in rural areas) have been found to be using reusable single layered cloth masks, which are, in most cases proved to be ineffective in providing necessary protection. In urban areas, this tendency has been traced among the people belonging to the lower income group. This may also be attributed to the recent skyrocketing of the price of surgical masks in the markets of Bangladesh making it difficult for the poor to avail in on regular basis.

As per our study findings, nearly 23% of the entire population in Bangladesh is currently using single use surgical masks of which 20% are based in the urban locations of the country and the rest 3% are based in rural areas. Considering an average use of 1 surgical mask per day per individual (while they go outside), an estimated 455 million surgical masks have been used by the entire population during the considered survey period. Surgical face masks are single use plastics and are dumped immediately after use. These large numbers of single use surgical masks have given rise to the generation of an estimated 1592 tons of single use plastic considering an average weight of about 3.5 grams per standard surgical mask. Other than the surgical masks, N95 Masks and some other masks of the similar quality are also being used by few proportions of the urban population who have been kept out of consideration of the present study.



Figure: Use of single layered cloth masks that are potentially ineffective in providing protection against virus transmission

✚ Use of Hand Gloves

Touching infected surfaces is another potential way of COVID-19 virus transmission. Considering this reality, a growing tendency of using disposable hand gloves has become evident both in urban and rural areas of Bangladesh. Two different kinds of hand gloves are currently being used by the community people – polythene made hand gloves and surgical hand gloves. The use of surgical hand gloves is evident in some of the major cities of the country while people in most of the districts have preferably adopted the use of polythene made lightweight hand gloves.



Figure: Disposable Polythene made hand gloves

Figure: Latex made disposable surgical gloves

Large number of city dwellers and street vendors specifically in urban areas have been using polythene made lightweight single-use hand gloves. Polythene hand gloves have become exclusively popular mostly because of its low price, higher availability and convenience of usage. Our study suggests that, around 30% of the entire population in Bangladesh are currently using hand gloves while dealing with outdoor activities majority of whom are based in urban areas (25%). However, in many of the instances, the street vendors and hawkers plying around the streets of the cities have been traced using gloves in only one hand indicating towards their inadequate sense of hygiene and safety. Considering an average use and disposal of 1 pair of gloves per day per user, an aggregated 1216 million polythene hand gloves have been estimated to be disposed by the population throughout last one month referring to the generation of about 3039 ton of disposable plastic waste. Of this, about 2257 ton has apparently emerged from the urban areas of the country as the tendency for using hand gloves as well as the number of businessmen and vendors plying in the roads are higher in urban areas than in rural areas.

Besides polythene made lightweight hand gloves, a particular segment of the population has also been found to be using relatively heavy weight surgical hand gloves mostly in six major cities of the country - Dhaka, Chittagong, Sylhet, Rangpur, Gazipur and Narayanganj. According to our study suggestions, an estimated average of about 9% population from these six cities are opting for the use of single use surgical gloves on a regular basis. The combined usage in these six cities during the last one month has been estimated to be about 189 million pieces. Surgical hand gloves are comparatively heavyweight and more durable than the usual ones. A standard size surgical hand glove may weigh up to 15 gm. Considering an average use of 1 pair per day per user, an additional 2838 ton of single use plastic waste has been estimated to be generated from the use of surgical hand gloves in these six cities.

Use of Polythene Shopping Bags:

During the ongoing crisis situation, use of disposable polythene shopping bags has become widely popular as a safe practice among the people in Bangladesh particularly for buying food items from markets and grocery shops. Based on the growing concern over the spread of COVID-19 virus through airborne particles and also through touching surfaces, people across urban and rural areas of the country have started preferring buying groceries and food items packed in single use plastic or polythene shopping bags so as to protect the items from toxicity or infection. In fear of the outer surface of the polybag containing infectious substances, people tend to immediately dispose these polybags as soon as they reach home from outside. Besides, use of reusable cloth made shopping bags, which was quite a common practice in Bangladesh, has become informally suspended these days in fear of the reusable bags carrying the viruses for long and eventually increasing the risk of virus spread with repeated usage.



Figure: Use of Polythene shopping bags for carrying grocery items has become extremely popular among community people in Bangladesh during the COVID-19 response phase

Frequency of the use of polythene shopping bags has been found to be varying between marginal or poor households and the households with relatively better economic conditions in Bangladesh. Financially solvent or economically stable households are relatively more concerned over the health and hygiene concerns and consequentially, they have been traced to be using an average

of 10 polythene shopping bags per week for the purpose of grocery shopping mainly. About 78.8% of the entire households in Bangladesh apparently falls within this group.

Apart from use by upper and middle-income class communities, people living below the poverty line are also indirectly associated with the disposal of significant amount of polythene shopping bags during the ongoing crisis period. In the face of monthlong lockdown, the marginal population of the country, which comprises around 21.8% of the entire population, are in the most deplorable state owing to sudden loss of employment or income generating options and are unable to avail their regular income. To help them out, several govt. non govt. organizations as well as the civil society has stepped forward and have been found to be distributing reliefs among the distressed population throughout the entire month. In most of the cases, these relief items are packaged with single use polythene shopping bags. Thus, although not directly, the marginal households in Bangladesh have been indirectly contributing to the use of polythene bags during this crisis situation. Our survey findings suggest an average dumping of a minimum 5 lightweight polythene shopping bags per week by per marginal household. This apparently led to the generation of an estimated 709 tons of single use plastic waste solely from polybag usage for relief distribution during the last one month.

In our study, polythene shopping bag has been identified as the largest source of single use plastic waste generation in Bangladesh during the ongoing COVID-19 response phase accounting for about 5796 ton of plastic waste in a single month.

Use of Hand Sanitizers:

As part of individual awareness, use of disinfectants and sanitizers has soared high, particularly in the urban locations of the country. Besides, surgical masks, hand gloves and polythene bags, containers of hand sanitizers, that are being massively used in the current context are also generating certain amount of single use plastics. Research findings suggest that, around 30% of the total populations use hand sanitizers in Bangladesh mostly in urban locations. The empty containers of the hand sanitizers add to the single use plastic waste stream. An estimated 49 million hand sanitizers have been purchased and the empty containers been thrown away in the last one month in Bangladesh. Hand sanitizer's 40-60ml plastic tube or container weighs about 18gm in average. This one-time container/tubes contribute around 900 tons/month in the COVID-19 single use (onetime) plastic waste stream.

Summary Table: Single Use Plastic Waste Generation in communities During COVID-19 Response in Bangladesh (26th March- 25th April 2020)

Single- Use item	Numbers (in million)	Weight (in Ton)
Surgical Masks	455	1592
Polythene Hand Gloves	1216	3039
Surgical hand Gloves	189	2838
Polythene Bags	1449	5796
Hand Sanitizer Bottles (ml)	49	900
Total	3,358	14,165

5.2.2 Healthcare Facilities:

Health care facilities have been identified to be one of the major sources of infectious or hazardous plastic waste generation during COVID-19 response. Types of plastic wastes in medical centers and hospitals include a great variety. Considering the restrained scope of data collection during the ongoing lock down phase in Bangladesh, this study has integrated the consideration of only two types of single-use plastic wastes emerging from medical care facilities – surgical masks and surgical hand gloves. These items are mostly used to ensure safety of the medical professionals against any kind of infection and hence, this personal protective equipment is getting generated at a considerably large amount in the dedicated hospitals and treatment centers where COVID-19 infected and suspected patients are being treated or dealt with. However, in between the ongoing fright with regard to COVID-19 spread, doctors and medical professionals around the country in normal public and private hospitals are also opting for the regular use of disposable surgical masks and gloves as a precautionary measure to secure protection against virus transmission from unidentified COVID-19 patients. Besides the hospitals and medical centers, medical professionals and biologist at the pathological laboratories conducting COVID-19 tests have also been using certain single use plastic items required for sample testing purposes.

Hospitals and Medical Centers:

More than 60 dedicated hospitals around the country are currently providing treatment to COVID-19 infected patients. Due to current emergency situation, movement has been strictly restricted by government orders and consequentially it was not possible to collect data from first hand sources. For our research purpose, we had to develop an empirical framework for the estimation of mask and gloves usage in hospitals based upon the information gathered from desk study and other secondary sources and through expert consultation. As per our defined model, the number of doctors and health professionals who apparently came in close contact with COVID-19 infected or suspected patients during the last one month has first been identified and in the subsequent phase their potential usage has been estimated on the basis of empirical inferences by experts.

Our study insights suggest that, during the first two weeks of our referred time period (from 26th of March up to 9th March 2020) average arrival of suspected patients in the COVID-19 dedicated hospitals in Dhaka were near to 1000 patients per day and 2000 for the later 2 weeks whereas these figures were respectively 700 and 1500 per day combinedly for two other worst hit cities in Bangladesh -Gazipur and Narayanganj. For the rest of the districts, this value ranged from a combined average of 500 to 1000 patients per day. Based on the expert advice, it has been assumed that for every 10 infected or potentially infected patients, there were 3 medical professionals who served as the direct attendee (One doctor and two nurses) in providing health care to these ailed personnel. This leads to a total 21840 (approx.) number of medical professionals to come in close contact with COVID-19 patients during the last one month. As per the expert opinion, the doctors and nurses who came in close contact with COVID-19 infected and suspected patients had to frequently use and dispose surgical masks and gloves, on an average at a rate of about 6-7pairs of surgical gloves per day and 6-7 pieces of disposable surgical face masks along with other personal protective equipment. Besides that, doctors in general hospitals around Bangladesh have also been using on an average at least 2 disposable surgical face masks and hand gloves while the nurses at least a pair of surgical masks on daily basis as part of extended precautions taken to prevent COVID-19 infection.



Figure: Use of surgical Face masks and surgical hand gloves by health care professionals in Hospitals of Bangladesh

All these has supposedly resulted in the generation of an estimated 250 tons of single use plastic from the hospitals during the last one month solely from the use of masks and gloves by health professionals. However, regular medical waste generation in hospitals has declined substantially during this month as the number of regular patients has decreased to a great extent owing to the government imposed restrictions on movement and also due to the growing tendency of people of avoiding contact with infectious substances that are abundantly prevalent in hospital environment.

📌 Sample Testing Laboratories:

Currently, 33 pathological laboratories are operational for COVID-19 testing in Bangladesh and these laboratories generate considerable amount of single use plastic waste on regular basis. Provided that, reaching out to these facilities for empirical data collection is not possible right at this moment, this study has tried to derive estimation particularly from this source considering the user perspective. As per the government reports published on 25th of April 2020, total number of tests conducted in Bangladesh till 25th April was 43113⁷.

⁷ https://corona.gov.bd/?gclid=EAlaIqObChMlrdb_o_Kb6QIVwzUrCh2dmwTzEAAYASAAEgIhpvD_BwE

Empirical references suggest that for each of the testing, at least a pair of hand gloves and a disposable surgical face masks has been utilized by the personnel who were associated with the handling and testing of the samples. This led to the aggregated use and subsequent disposal of minimum 43113 masks and 86226 numbers of surgical gloves in total by far only for the sample testing purposes. This has generated an additional 1.1 ton of singles use plastic waste during the last one month.

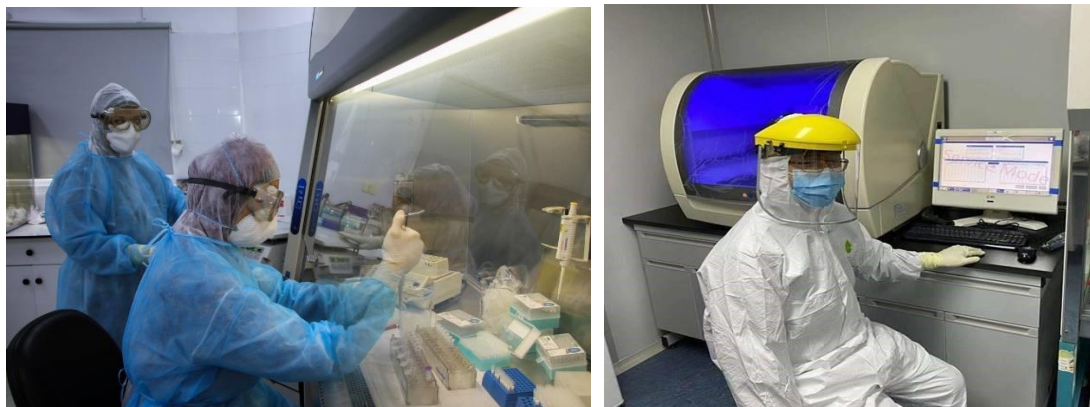


Figure: Use of Surgical face masks and gloves during COVID-19 sample testing in laboratories

5.3 Hazardous Plastic Waste Generation Scenario in Dhaka: (At Household and Community Level)

Summary Table: Single Use Plastic Waste Generation during COVID-19 Response in Dhaka (26th March- 25th April 2020)

	Numbers (in Millions)	Weight (In tons)
Surgical Masks	128	447
Polythene Hand Gloves	241	602
Surgical Hand Gloves	87	1314
Polythene Bags	111	443
Hand Sanitizer Containers (ml)	15	270
Total	582	3076

🚑 Surgical Face Masks:

In the capital city of Dhaka, the rate of use of single use surgical masks are relatively higher compared to other urban areas of the country. About 35% of the people, currently residing in Dhaka, are using surgical masks on daily basis while going outside. This has added an estimated 447 tons of single use plastic waste into the usual municipal solid waste in Dhaka during the last month. Here is to mention that, about 40% of the entire population in Dhaka has moved to their native districts in the occasion of the government leave. Only an estimated 60% are currently residing in the city and these calculations have been based upon the remainder population.

Polythene Hand Gloves

In Dhaka, near to 33% of the dwellers have adopted the use of polythene made single use gloves on a regular basis while going outside for grocery shopping or any other emergency purposes. About 241 million polythene hand gloves have reportedly been used and dumped in Dhaka city in the last one month weighing approx. 602 tons in total (considering an average weight of polythene hand gloves to be approx. 2.5 grams)

Surgical hand Gloves

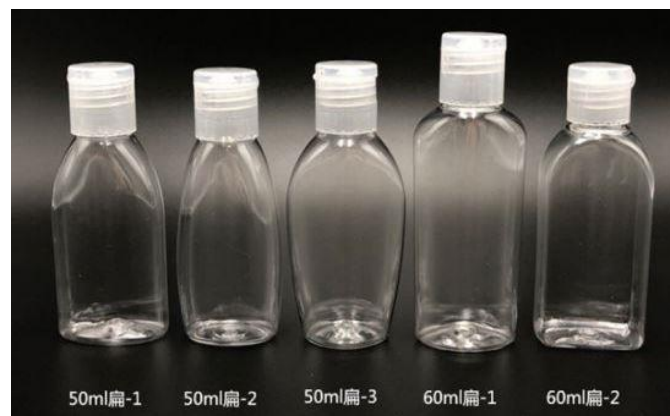
In Dhaka, 12% of the population have been empirically found to be using surgical hand gloves giving rise to the aggregated generation of 87 million pieces during surveyed period. From the perspective of single use plastic waste generation, use of surgical hand gloves by the commoners in Dhaka have created some 1314 tons of single use plastic waste in the very first month of COVID-19 community transmission phase in Bangladesh. Surgical gloves are designed for single use and are advised to be immediately disposed after usage. However, these gloves are comparatively more sustainable than the usual poly gloves and hence in many of the cases, the users have been found to be using the same gloves again and again without adopting any kind of disinfection practices at all. Such practices apparently raise the concern over virus containment threatening the consumer's health and safety.

Polythene Shopping Bag

In Dhaka, around 443 tons of plastic waste has been estimated to be generated from about 111 million discarded polyethene in the last one month emerging from the use of polythene shopping bags by the community people and distribution of relief items among the poor and the distressed.

Hand Sanitizer Container:

Of the total country usage, about 30% are used by the people living in the capital city of Dhaka. This accounts for the disposal of nearly 15 million empty containers of hand sanitizers in a single monthly accounting for nearly 270 ton of plastic waste to be added into the waste stream.



a. Projection of Plastic Waste Generation from 26th March-25th April, 2020 in Dhaka City and Bangladesh

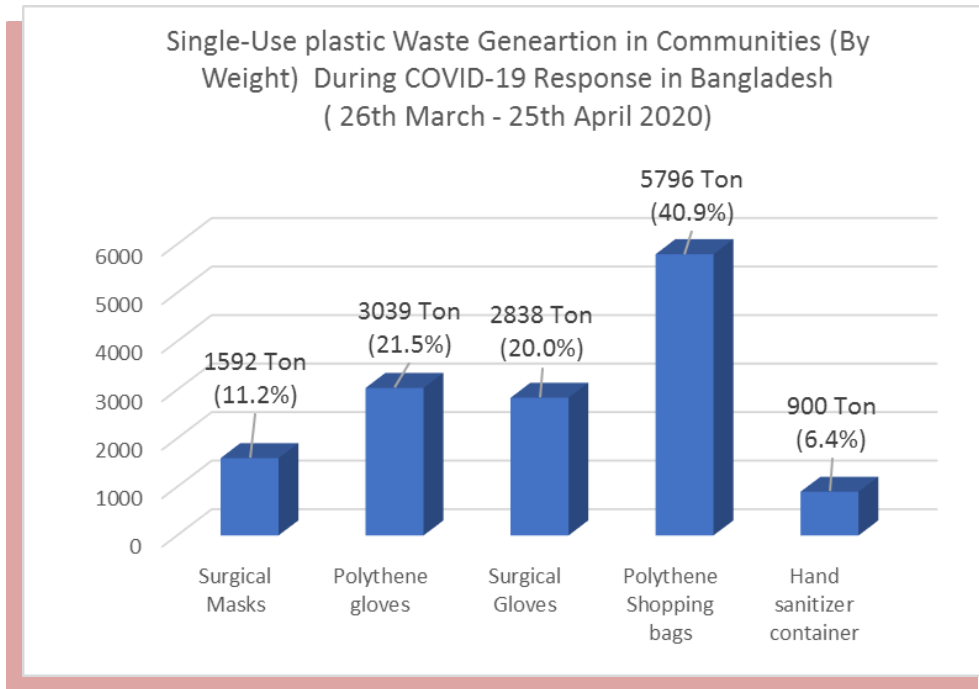


Table-1: SUP waste by weight

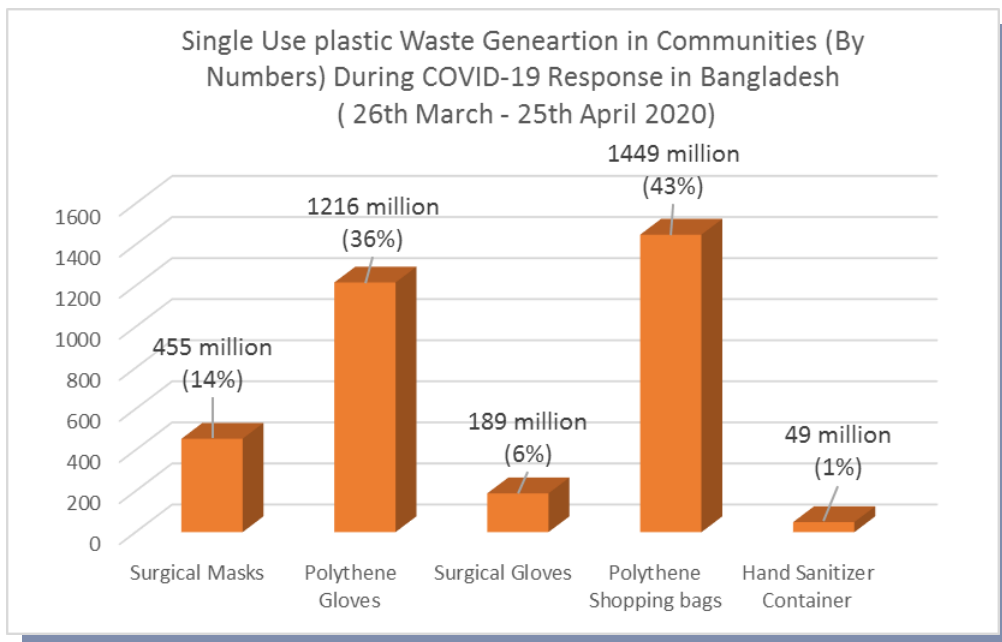


Table-2: SUP waste by number

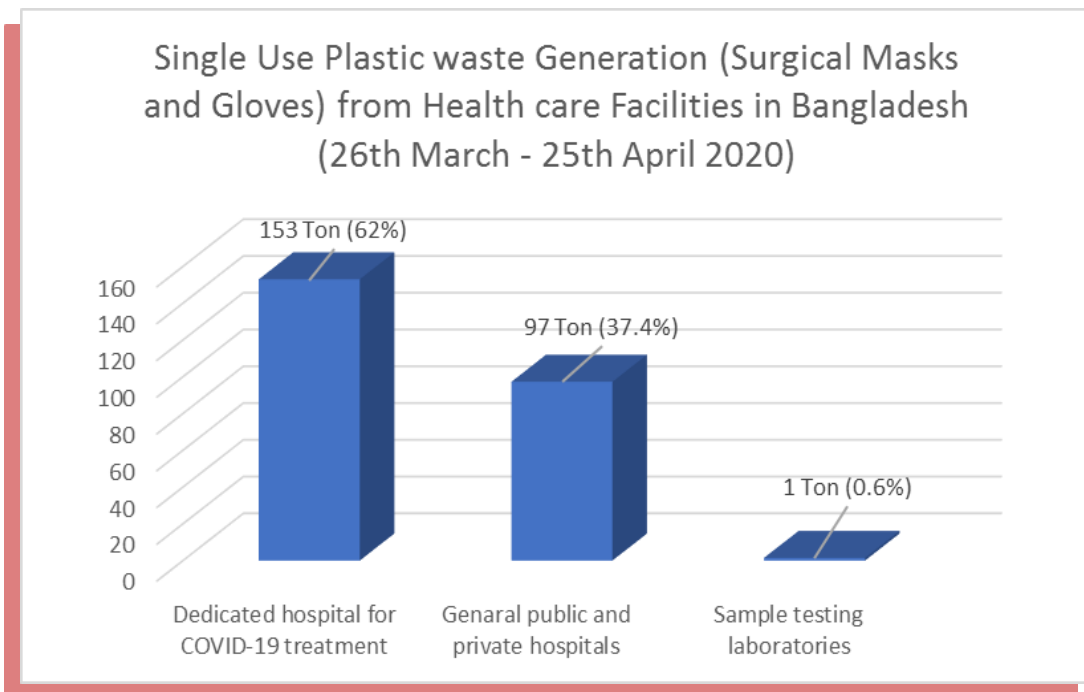


Table-3: SUP waste- Surgical masks and hand gloves (From Health care facilities)

b. Single Use Plastic waste generation in Dhaka during 26 March-25 April, 2020

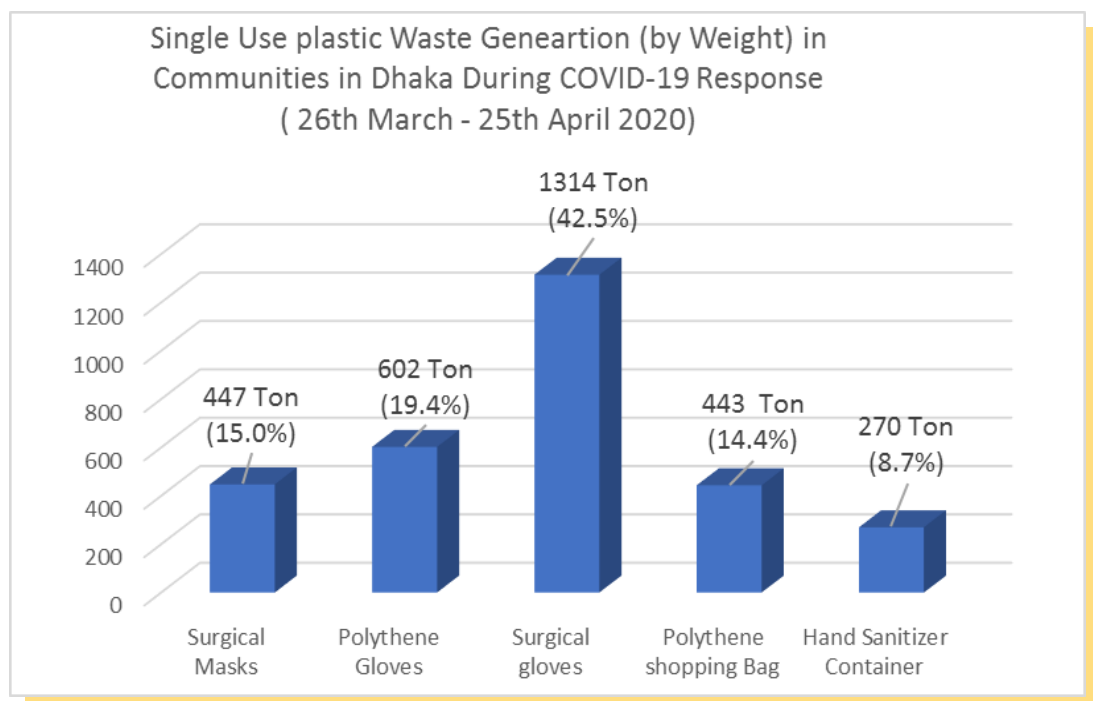


Table-4: SUP waste- generation by weight in Dhaka

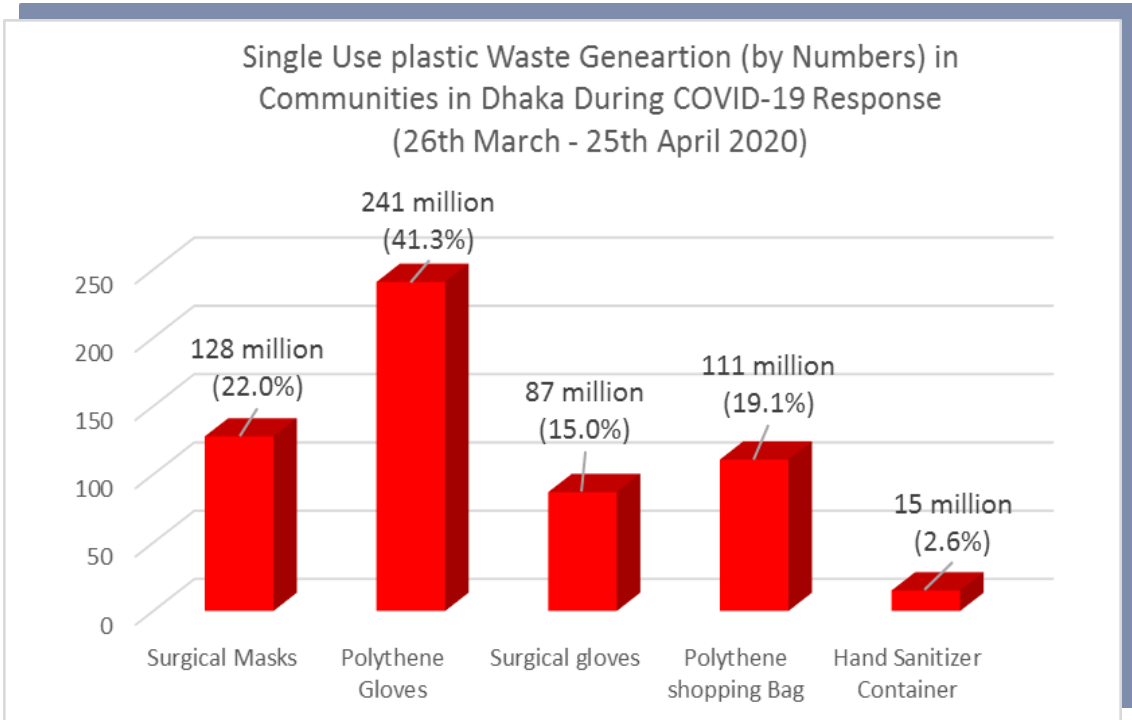


Table-5: SUP waste- generation by numbers in Dhaka

c. Comparative Hazardous/infected single use plastic waste waste generation

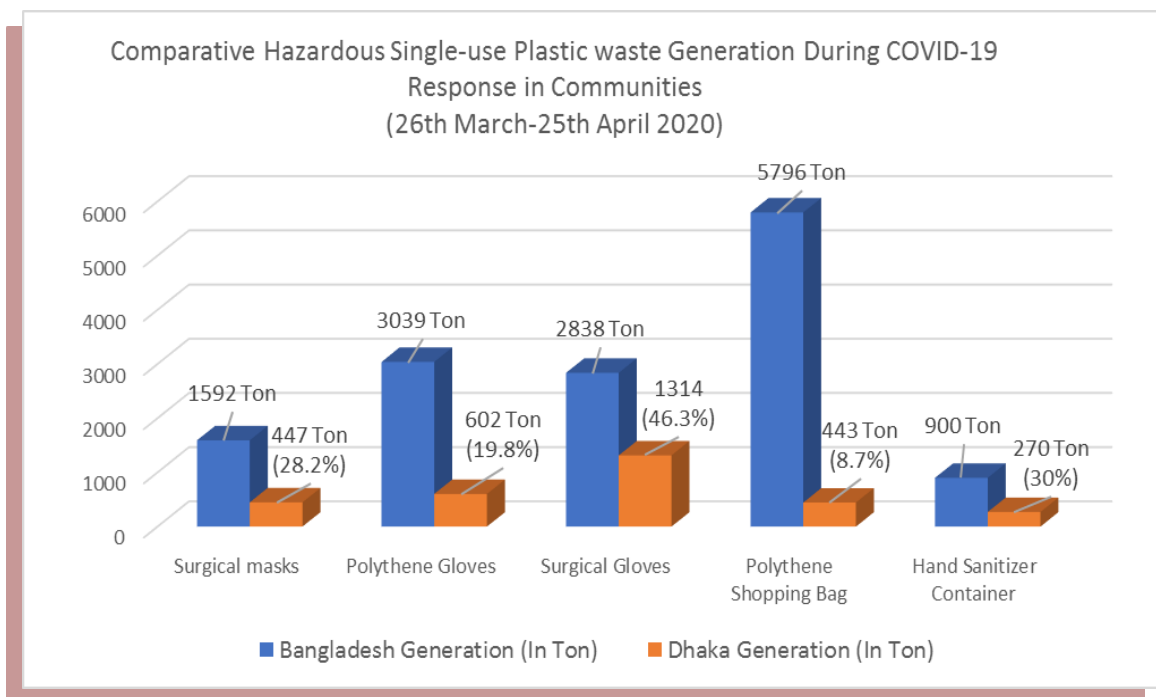


Table-6: Comparative SUP waste generation

6. Health Risk Associated with Hazardous Plastic Waste collection and management during COVID-19 Response

The outbreak of COVID-19 has resulted into massive surge in infectious and hazardous waste generation, a great portion of which are plastics or to be precise, single use plastics. The huge demand for disposable personal protective equipment and medical instruments, such as single-use hand gloves, surgical masks and empty IV bags in the wake of the pandemic, has created a deluge of hazardous medical waste. There's more to worry about than just the wastes emerged from medical facilities. The disease has already spread out beyond hospitals. Some people who have minor symptoms are recovering at home. Others who are asymptomatic might not know that the trash they're throwing out could be contaminated. The home garbage put out by both sick and asymptomatic individuals in communities may contain infected masks, gloves or polythene shopping bags. Thus, people are generating plenty of potentially virus-laden trash on regular basis. The main groups at risk in contracting virus from these hazardous plastic wastes generated in households include - workers engaged in cleanup operations and at waste disposal facilities, workers in support services such as laundry, waste handling and transportation and scavengers.

Generically, single-use disposables can harbor viruses and pathogenic bacteria. They are subject to whatever pathogens have settled on them from manufacture, transport, inventory stocking, and eventual use. Single use plastic is also a proven long-term carrier of the COVID-19 virus. Recently a research report published in the New England Journal of Medicine, described the stability of the novel coronavirus, SARS-CoV-2. The report said the virus can remain stable for about four hours on copper, up to 24 hours on cardboard, and for 72 hours on plastic and stainless steel⁸. Several other studies have suggested that, the COVID-19 virus can survive from 3 days up to five days upon plastic surfaces which is longer than any other surface materials.

Waste collectors or sanitation workers get directly exposed to hazardous plastic wastes during collection, handling and transportation of infectious wastes from sources to storage facilities. Discarded masks, gloves and other PPE could be potential sources for the spread of this highly contagious virus. When the discarded plastic wastes or garbage bags carrying virus upon them are collected or handled by waste collectors or personnel in waste management facilities without proper precautionary measures, it may also get them infected. As the virus can survive and remain active up to several days on plastic surfaces, any other person in the waste disposal

⁸ <https://hub.jhu.edu/2020/03/20/sars-cov-2-survive-on-surfaces/>

facilities who gets in contact with a contaminated plastic surface within this time period will get immediately infected. However, over the course of each workday, the waste collectors visit thousands of homes, businesses and hospitals and if they get infected, they may spread it among fellow employees, or also along the entire route they visited.



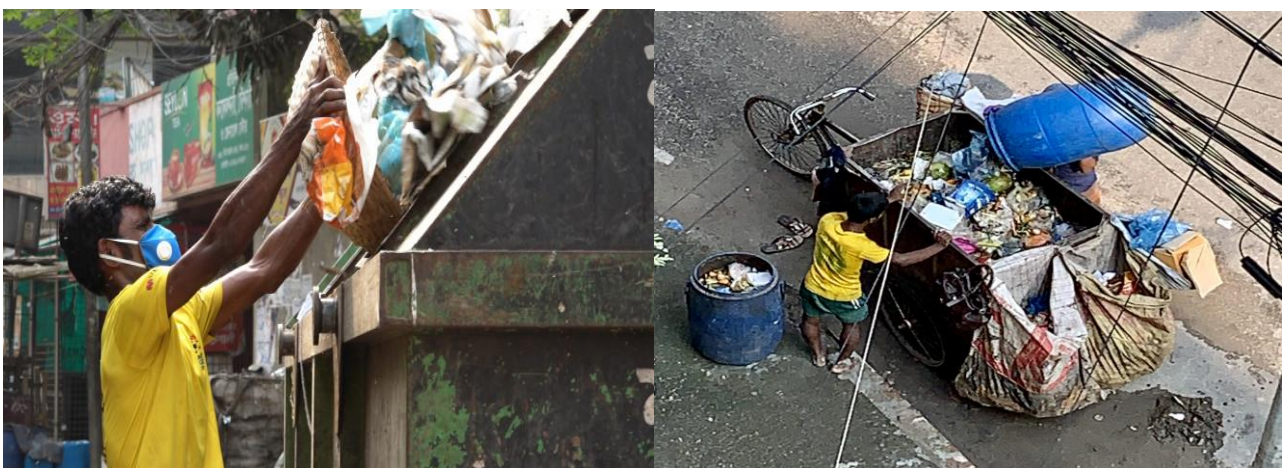
Figure: Informal waste collectors in Dhaka are continuing their service in the wake of the COVID-19 pandemic without adequate protection risking their health and safety

Informal waste collectors in Dhaka city are at great risk of COVID-19 infection. Dhaka city comprises of around 5 million households contained in nearly 0.26 million holdings unevenly distributed in 129 wards under Dhaka North and South City Corporations. Existing municipal waste collection mechanism in Dhaka suggests door-to-door collection of household waste in traditional waste carrying vehicles or rickshaw vans by informally employed workers. A standard informal waste picking vehicle (rickshaw van) collects waste from an average 100 holdings daily. Each of the vehicle comes with a minimum two informal workers – one driving the van and another serving as a helping hand in the collection process. Besides that, there persists a temporary waste disposal and storage point in each of the ward where an average 7 to 8 informal workers are involved in waste handling and sorting. As per these considerations, an estimated 6000 plus informal waste collectors are associated with the municipal waste collection and management process alone in Dhaka. However, empirical evidences suggest that, during the COVID-19 response phase, the number of operational waste collectors or waste handling workers has reduced to about 50% in Dhaka. Out of those who are still working, many are getting frequently sick and are being replaced by new ones. Their physical illness may be attributed, to some extent, to their frequent contraction with hazardous and infectious substances. Besides, nearly 100,000 waste pickers work in Dhaka alone. It employs women and children and wastes picking children in Dhaka is popularly known as 'tokai'. But after the coronavirus outbreak, most of them are absent from the work or self-withdrawal from this work due to lockdown.

Around 40 thousand of informal wastes collectors/workers are continuing to collect waste from the doorsteps of 61 district town in Bangladesh and the Capital Dhaka. Workers around 6000 are in the Dhaka city at high risk; no one bothers of their health-safety at all. According to them more than 1500 hundred are already getting sick and stay at temporary shelter in the city or left for home village.

Informal municipal waste collectors of Dhaka are rendering important services during the ongoing crisis situation. Considering the health threats posed by infectious wastes, the waste collectors and waste management workers in waste disposal facilities should be equipped with necessary personal protective equipment including masks, hand gloves and PPE. However, the informal waste collectors in Dhaka are working without adequate protection with heightened risk of getting infection from hazardous wastes. Local government or municipal intervention in ensuring the health safety of this informal labor group is still minimal to non-existent. Also, no municipal surveillance workers were found to be actively working for the specialized management of hazardous waste generated during COVID-19 response. The authorities should take immediate action to provide necessitated protection to these informal waste pickers in view of the greater public health interests.

According to the public health expert, cleanliness and personal hygiene have no alternative to the prevention of coronavirus disease. So, it's very important to give more attention to the protection of the waste collector and all workers related to clean up in communities. Considering the health threats posed by infectious wastes, the waste collectors and waste management workers in waste disposal facilities should be equipped with necessary personal protective equipment including masks, hand gloves and PPE. The authorities should take immediate action to provide necessary protection to informal waste pickers in view of the greater public health interests.



7. Environmental Impacts of COVID-19 generated hazardous plastic waste

Improper disposal of hazardous COVID-19 plastic waste can cause massive pollution of environmental components including soil, water and air. Medical waste is particularly difficult to handle as it is a mix of both wet and dry waste, is highly contagious. When a high volume of medical wastes gets generated within short time interval it becomes often impossible to segregate the waste and treat them before sending them to landfill or to incinerate. When infectious hazardous wastes are directly dumped into landfills, soil contamination occurs. These chemicals are absorbed by plants which are later utilized by other organisms including humans which as a result can cause disease or even death. The infectious substances may get mixed with the soil and rainwater and ultimately get carried away to waterbodies and groundwater as toxic leachates. Improper waste disposal can also interfere with the food supply as plant growth is impaired reducing the amount of food produced.

Incinerating waste also causes problems, because plastics tend to produce toxic substances, such as dioxins, when they are burnt. As bulk quantity of highly contagious medical waste (a great majority of which are plastics) are incinerated in normal incineration facilities, it causes the release of highly toxic gases, fumes, heavy metals and contagious airborne substances as well severely affecting the nearby air quality. Gases from incineration may cause air pollution and contribute to acid rain, while the ash from incinerators may contain heavy metals and other toxins⁹. Because of these problems there are active campaigns against waste incineration.

The improper disposal of infectious waste may adversely impact wildlife. The animals cannot distinguish between edible and nonedible items and they often tend to consume the trash, laden with contagious plastics resulting in their deaths. Fish, seals, turtles, whales and other aquatic species in the ocean also mistake plastic fragments to be their foods and try to consume them. Due to ingestion of trash or plastics, starvation is usually the next step because some species do not have high acidic levels in their stomach to break down the object that they ingested.

Plastic fragments have been known to be able to last for more than 100 years. When it comes to biodiversity, our waste problem is severely plaguing the health of the world's species¹⁰.

⁹ <https://www.greenchoices.org/green-living/waste-recycling/environmental-impacts>

¹⁰ <https://www.earthday.org/how-our-trash-impacts-the-environment/>

Hand Gloves can harm food chain:

Most of the hand gloves using by the general public are made of polyvinyl chloride (PVC). This type of chemicals knows to leach into food, particularly into fatty food like meats, oily, upon contact. So if this kind of gloves or related protective and infected materials mix-up with household particularly kitchen waste can be leached and if the waste contact to the natural food chain it will harm the system. A recent study found that “one out of seven vinyl or PVC food service gloves tested contained toxic phthalates.”¹¹

Table: Major effects of contaminated single use plastics products

Major Effects of contaminated masks, gloves, polybags, and others related Single-Use plastics:

1. Surface water and ground water contamination
2. Soil contamination
3. Incises toxicity on the food chain
4. Direct and indirect viral diseases transition
5. Adverse impact upon human, plants, fishes and birds.
6. Adverse impact upon wildlife
7. Effect upon domestic animals.
8. Epidemics of unlike viral infections
9. Social and economic costs associated with the above-mentioned impacts.

8. Why Incineration might not be a permanent solution to the Hazardous COVID-19 Waste Problem?

For decades, incineration was the method of choice for the treatment of infectious wastes. But incineration method is too much harmful for our environment as well as for human health. Incineration releases a wide variety of pollutants depending on the composition of the waste, which leads to health deterioration and environmental degradation. Mechanic incinerators at the incineration facilities operate at 850°C in the primary chamber and up to 1,200°C in the secondary chamber. This not only kills the viruses contained in the waste but also generate toxic emissions that create an adverse impact on human health and environment.

¹¹ <https://www.toxicfreefood.org/wp-content/uploads/2019/07/Glove-Top-Findings-FINAL.pdf>

Emissions from an Incinerator

In Incineration facilities, the incineration process produces two types of ash. Bottom ash comes from the furnace and is mixed with slag, while fly ash comes from the stack and contains components that are more hazardous. In municipal waste incinerators, bottom ash is approximately 10% by volume and approximately 20 to 35% by weight of the solid waste input. Fly ash quantities are much lower, generally only a few percent of input. Emissions from incinerators can include heavy metals, dioxins and furans, which may be present in the waste gases, water or ash. Plastic and metals are the major source of the calorific value of the waste.

Table: Health impacts of incineration

Incinerator pollutant	health impacts
Particulate matter PM10 (the smaller the more dangerous) > Ultrafine and nanoparticles	Asthma, decrease lung function, premature death for people with heart or lung disease, heart attacks, coughing, difficulty breathing > Enter lung membrane and bloodstream to brain à brain cancer
Carbon monoxide	Headache, dizziness, heart disease
Hydrogen chloride	Chronic bronchial inflammation, changes in pulmonary function
Arsenic	Lung and throat irritation, skin effects
Cadmium	COPD, kidney damage, possible lung cancer
Chromium (Hexavalent)	Lung cancer, kidney and liver damage
Mercury (Inorganic)	Effects on central nervous system
Lead	High blood pressure, heart and kidney disease, abdominal pain, depression; lower IQ and delayed learning for children
Polyaromatic hydrocarbons (PAHs)	Increased risk of skin, lung, bladder and gastrointestinal cancers; kidney and liver damage

9. ESDO Initiatives to Raise Public awareness in preventing COVID-19 Spread in Bangladesh:

ESDO has always been the pioneer in drawing media attention and raising mass awareness on contemporary societal and environmental crises in Bangladesh and beyond. Since the beginning of the ongoing COVID-19 public health emergency in Bangladesh, ESDO has been disseminating information among the public on safe practices to maintain health and hygiene through digital platforms. Owing to the ongoing lockdown phase, outdoor awareness raising program organization has been restricted but this has not been able to limit awareness raising initiatives of ESDO. ESDO has been utilizing digital means (Facebook, Instagram, website) to reach out to a large number of people through posting informative IEC materials and news on regular basis. Some of the IECs have been attached as references. However, to draw attention on the management of hazardous plastic waste generated during COVID-19 response and ensuring the safety of the waste management workers in Bangladesh ESDO has also issued an **Official Press Release** on 22nd April, on the occasion of Earth day 2020.

Reduce your risk of COVID - 19

Wash hands frequently with soap and water or use a Sanitizer gel

Catch coughs and sneezes with disposable tissues

If you don't have a tissue use your sleeve

Limit social gatherings and time spent in crowded places

If you touch something contaminated and then touch your face or another's face, You might fall ill

ESDO

The symptoms of COVID-19 in children are similar to those in adults, including sore throat, dry cough, and difficulty breathing

How to Protect Your Children from COVID-19

Avoid Crowds

Keep Children away from Sick People

Cough or Sneeze with Care

Encourage Children to Wash Hands frequently

Keep things Clean

Stay Home, Stay Safe

ESDO

DID YOU WASH YOUR HANDS FREQUENTLY?

During COVID-19: Wash your hands with soap and water

Remember to turn off the tap while soaping

Prevent Water Wastage as You Prevent COVID-19
Close the tap while you rub your hands

ESDO

How Novel Corona Virus can Spread through Single Use Plastic bags

Infected sales person putting products (also could be contaminated) in the Single Use Plastic bags

The buyer taking the contaminated Single Use Plastic bags from the infected sales person

The buyer putting the contaminated Single Use Plastic bags on the table and other surfaces.

The contaminated Single Use Plastic bags are thrown away in the waste bins, or other wastes are kept in the contaminated Single Use Plastic bags.

All the cleaning staffs are getting infected with Novel Corona Virus in the process, and Transmit to others.

The contaminated Single Use Plastic bags are taken to the recycling station where the infected waste Picker is working side by side with many other cleaning staffs.

The waste Picker taking the contaminated Single Use Plastic bags by hands to the waste disposal vans.

"Be Careful, Be Safe"

Environment and Social Development Organization

ESDO

10. Limitations:

- Due to ongoing countrywide lockdown, data collection from first hand sources through field survey, observation and other primary data collection methods could not be performed.
- Considering time and resource constraints, the scope of this research has been kept limited for the medical wastes generated from healthcare facilities. Diverse form of medical wastes is being generated from the hospitals but not all the types of hazardous plastic wastes emerged from healthcare facilities have been considered in this research.

11. Recommendations:

The most important guidance during COVID-19 regarding the provision of solid waste service includes following provisions:

- Waste management operations and services shall not be disrupted in order not to create additional pressure on public health and hygiene.
- Medical waste from hospitals and other health-related institutions has to be collected, stored, transported, treated and disposed of without any further infection and pollution risks. On-site treatment/disposal is preferred in order to minimize transport risks.
- The risk of a significant number of waste pickers or waste management employees being unable to work might result in a new type of operational challenge. It is recommended that staffs involved in handling potentially infectious solid waste shall be equipped with personal protective equipment (PPE) used for medical waste handling. Waste workers (especially collection workers) should take occupational health and safety precautions to avoid any possible infections by waste streams / equipment.
- The public shall be informed on specific guidance for waste collection in infected households and the provision of services in general.
- Every household and individual should responsible to follow instruction by the govt. or municipal authorities. All waste that has been in contact with any self-isolated individual should be double-bagged or covered bin and tied to prevent the spread of the coronavirus or any infectious substances with single use plastics.

12. Conclusion:

The CORONA VIRUS pandemic has adversely affected the whole global economy and disrupted the waste, plastic, and recycling industries. At first glance, plastics production, and recycling sectors appear linked to essential services only during waste management, but in reality, they are intimately connected to a thriving economy and critical public health roles. Significant limitations on recycling and municipal waste services have been caused due to the uncertainties associated with the COVID-19 pandemic.

The COVID 19 pandemic is spreading continuously and for that reason its adverse impact on human health and environment is increasing day by day. Government is urged to treat waste management which includes of medical, household and other hazardous waste as an urgent and essential public service in order to minimize possible secondary impacts upon health and the environment. Infectious or hazardous wastes are needed to be segregated and disposed following standard methods in order to minimize their associated impacts. Effective management of biomedical and health-care waste requires appropriate identification, collection, separation, storage, transportation, treatment and disposal, as well as important associated aspects including disinfection, personnel protection and training.



Donations of Masks, Gloves and other COVID-19 Aid to Bangladesh:

UNB
www.unb.com.bd

BANGLADESH POLITICS BUSINESS SPORTS WORLD TECH ENTERTAINMENT LIFESTYLE

www.xinhuanet.com XINHUANET

Ffp2 /KN95 /Factory Supply - Ffp2/KN95/with valv
Ffp2/Factory Supply handsanitizerfactory.com

Home > Bangladesh > Foreign Affairs

China Railway Group donates medical supplies to Bangladeshi hospitals

Source: Xinhua | 2020-04-08 00:09:49 | Editor: huang

The CREC donations included 10,080 N95 masks, 40,000 disposable surgical masks, 1,000 Medical protection gowns, 400 medical goggles, and 500 COVID-19 detection Kits.

UNB NEWS DHAKA PUBLISH: MARCH 28, 2020, 09:10 PM
UNB NEWS - UNB NEWS 894 VIEWS

The Financial Express

Monday, 4 May 2020 | Today's FE | e-Paper

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Carew's hand sanitiser to hit market Monday

Published: March 22, 2020 17:24:02 | Updated: March 22, 2020 18:49:51

Carew & Co will release its health sanitiser in the market at an affordable price on experimental basis on Monday to meet the growing demand amid the coronavirus outbreak.

The company has started producing the sanitiser recently as part of a move of the industries ministry to protect the country's people from COVID-19 and the sanitiser will be available in the market soon, reports BSS quoting a press release.

Dhaka Tribune

Home / Bangladesh

Jamuna Group to start mass production of hand sanitizers

In order to keep ourselves disinfected amid the rapid spread of Covid-19, the demand for hand sanitizers is increasing every day and the ever increasing gap between supply and demand of hand sanitizers has caused chaos among the people of the country.

To tackle this issue, Jamuna Distillery Ltd, a concern of Jamuna Group, has taken the initiative to produce World Health Organization (WHO) standard hand sanitizers in its own distillery plant using ethanol, glycerol, and hydrogen peroxide.

On March 23, Jamuna Group obtained a no objection certificate (NOC) from Directorate General of Drug Administration for the production of hand sanitizers.



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Covid-19: India gifts Bangladesh 1 lakh anti-malarial tablets, 50,000 surgical gloves

Earlier, India gifted head covers and masks for medical professionals.

Press Trust of India
Dhaka
April 26, 2020 UPDATED: April 26, 2020 20:33:15T

India on Sunday gifted one lakh anti-malarial tablets of hydroxychloroquine and 50,000 surgical gloves to Bangladesh to help it combat the coronavirus pandemic which has infected nearly 5,000 people and killed over 100 in the country.

References:

1. 20-fold rise in Covid-19 cases in Bangladesh since April 1, Dhaka Tribune, 14 April 2020.
2. Mint Covid Tracker: India's corona trajectory has tapered this week but still remains steeper than Asian peers, livemint, 11 April 2020.
3. <http://unb.com.bd/category/Special/amid-covid-19-pandemic-biomedical-waste-turning-more-hazardous/49165>
4. <https://www.forbes.com/sites/thebakersinstitute/2020/04/14/pandemic-plastics-and-the-continuing-quest-for-sustainability/#1a2fc40a77b4>
5. <https://oceanconservancy.org/blog/2020/04/16/know-dont-know-plastics-coronavirus-pandemic/>
6. https://corona.gov.bd/?gclid=EAlaIQobChMIh7eqvbme6QIVFyUrCh0Pxwl_EAAYASAAEgINUPD_BwE
7. <https://www.greenchoices.org/green-living/waste-recycling/environmental-impacts>
8. <https://hub.jhu.edu/2020/03/20/sars-cov-2-survive-on-surfaces/>
9. <https://www.earthday.org/how-our-trash-impacts-the-environment/>
10. <https://www.linkedin.com/pulse/covid-19-challenges-provision-solid-waste-services-roland-ramusch>



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