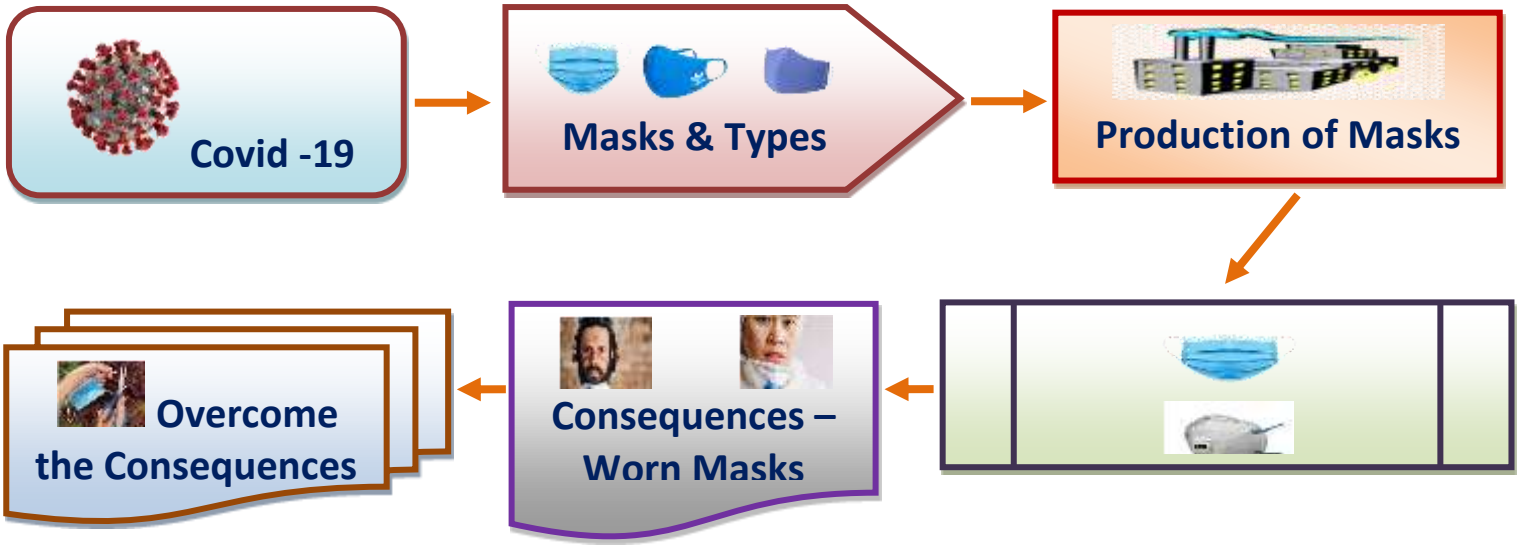
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USED AND THROWN COVID -19 MASKS – THE ADVERSE CONSEQUENCES

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A Pictorial Abstract



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INTRODUCTION

From the issues started, Covid-19, human beings are wearing a mask for safeguards. Coronavirus is a virus from a large family that causes illness. A severe spreading of Covid-19 pandemic situation, we have been using Personal Protective Equipment (PPE) like mask and respirators massively and littering the used masks and respirators becomes a huge problem such as pollutions, becoming a Covid-19 gateway, and hurting animals. We are frequently using masks and respirators for protecting the spreading of Covid-19. After one year is over of the Covid-19 pandemic situation, most of the people are not stopping to wear masks and respirators. The second wave of Coronavirus is now started and its malignancy is high than the previous Covid-19. India has launched the program of Covid-19 vaccination and it is compulsory for 40 and above age groups. The second wave of Coranavirus affects even a vaccinated person. It spreads very quickly to the people compare to the spreads of Covid-19 and its symptoms are different. Reducing the spread of Covid-19 and its second wave, the World Health Organization insisted to wear a mask. Wearing a mask is a safety measure for Covid-19 and its second wave, but nobody can take care of the huge stagnation of used masks. The increase of masks usage is directly proportional to the individual. The garbage of used mask seriously affects

domestic and wild animals, and become a headache to remove the heap of masks. This article describes the adverse consequences of used Covid-19 masks.

COVID– 19

COVID-19 is the abbreviation of Corona Virus Disease and it is spread in December 2019 at people cluster of Wuhan, the Republic of China which was observed by the World Health Organization (WHO). It is a disease caused by a new coronavirus called SARS-CoV-2 (World Health Organization [WHO], 2020). It produces common cold and also makes severe diseases like Middle East Repository Syndrome (MERS-Covid) and Severe Acute Repository Syndrome (SARS-Covid). Coronaviruses are transmitted between animals and humans in nature. It is evident that SARS-Covid was transmitted from civet cats to humans and MERS-Covid transmitted from dromedary camel to human. The process of transmitting animals to humans is called zygomatic. A novel disease was identified from the Coronavirus family and named as 'Covid-19". The incubation period of the Covid-19 is 1-27 days and the recovery time is 3 to 6 weeks. Covid-19 is a virus threat to the world and unfortunately, the world lost people from the countries, affected by it. Mask is something to wear that covers the parts of the face to protect or hide the face of a person. Today, the Covid-19 compels human beings to wear a mask, to secure themselves from the Covid-19. Mask protects the human beings from affecting Covid-19 from other ends and stops dissemination from Covid-19 affected persons. Covid-19 pandemic creates the mask as become an essential thing to the human being. The used masks have not been destroyed properly and it creates consequences to the human, animals, and environment.

Mask – The Meaning

Masks are used to filter the air to the breath of the human being. Masks are a key measure to suppress transmission and save lives (WHO, 2020). It is a material to cover the face that protects the respiratory system affected by hidden live or unlived particles while healing air. "A covering for all or part of the face that protects hides or decorates the person wearing it" (Cambridge Dictionary, n.d.). Masks are helpful to protect the faces and make the person different. It helps to protect a person from harmful pollutants like dust, mist, fumes, germs, pollen, allergens, and other irritants (Kapoor, 2015). It is used for disguise and to be a protecting covering of the face. "A covering for all part of the face, worn as a disguise, or to amuse or frighten others" Oxford Lexico, n.d.).In Middle French, the word 'Masque' is originated which means covering to hide or guard the face, from Italian the word 'Maschera, from medieval Latin the word 'masca' means mask, spectre, and nightmare (Online Etymology Dictionary, n.d.).Masks are designed to protect the masker (mask wearer) from injury or infection. Masks are categorized in personal protective equipment (PPE) like earplugs, goggles, gloves, etc. It is an interference device between the patient's upper airway and the breathing system (Kamal, 2015). Generally, masks are made up of black rubber, clear plastic, and elastomeric material or disposable plastic, or a combination of these materials. Mask is an object normally worn on the face for protection, disguise, performance, and entertainment (Allen, 2014). Krianksomuraj (2010) pointed out the mask is specially crafted to protect the user from air pollution and air-borne diseases.

Types of Masks

The masks are generally classified into two types and they are based on functions and based on usage (Muralikrishnan, 2017).

Based on functions:

- ✓ Comfort mask,
- ✓ Surgical face mask,
- ✓ Surgical respirators, and
- ✓ Particulate respirators.

Based on usage:

- ✓ Disposable, and
- ✓ Reusable

The types of masks are named based on their function and usages. Focusing on the purposes of the mask, the author of this paper categorizes the mask into three major types.

Dust Mask

Dust masks are used to filter the dust from the composition with air. Dust masks also called pollution masks and it protects the individual from harmful pollutants like dust, mist, fumes, germs, pollen, allergens, and other irritants

(Kapoor, 2015). It prevents lungs problem due to inhalation of dust in the air. The dust is filtered on the surface of the mask while inhaling the air. The limit of filtration of a dust mask is measure in permissible exposure limit (PEL) and it protects up to 50 mg/cu. meter [milligrams per cubic meter] (Hvacmach, 2006). Dust masks are manufactured in different styles and varieties with or without the approval of the National Institute of Safety and Health (NIOSH). There is N95/P95/R95, N99/P99/R99, N100/P100/R100 masks are available and the N indicates the approval by NIOSH and the number indicates the percentage of factorization of the dust particles. N99 and N100 are the dust masks mostly recommended because it filters very fine dust such as asbestos or silica. Dust masks are not fit to filter the chemical vapors, a heavy amount of dust, and highly toxic dust.

Surgical Mask

It is a disposable, loosely fitted, fluid-proofed, splash resistive device that covered the mouth and nose from under the chin, prevents potential contaminants and aerosol impurities. It is used in surgical areas and purposefully used to protect the patients from the direct transmission of infectious particles. European Directive 89/686 the surgical mask in non-PPE (Muralikrishnan, 2017).

Respirator

A three-layered device like face masks spun bounded inner and outer, non-woven needle felt inner layer that helps to secure the wearer from airborne hazardous contaminants. There are two types of respirator is available such as FFP1 respirator has lower filtering and protection factor and FFP2 has high filtering and protecting factor. KN95 respirators commonly made and used in china

IMPORTANCE OF WEARING MASK

Generally, healthy adults breaths12 - 20 times in a minute while at rest. Crowe (2016) mentioned in his/her forecast analysis report that face masks are designed for people's health and for preventing harmful substances which is visible or invisible in the air, so as not to be a bad influence on the human body. Mask helps prevent the inhalation of dust, spread saliva droplets from one person to another, and protects the lungs. Masks protect others as well as yours if you are wearing masks. Masks control the spreading of Covid -19 because the Covid – 19 is spreading through repository droplets and the masks block the droplet from one to other, other to him/her. The world health organization (2020) suggested that masks should be worn in the crowded area in which the virus is circulating and it's not advised to wear masks or respirators without valves. Because these masks or respirators are specially made for industrial workers, the valve is open and closed during exhale and inhale respectively. These masks are not Kiranksomaraju (2010) mentioned that 2.4 million people die due to the causes of air pollution reported by the World Health Organization.

Masks are useful in preventing the inhale of dangerous particles. Covid-19 also spread through the inhaling of the Covid-19 virus. The virus and bacteria cannot be seen by our eyes and they are microparticles. Wearing a mask can control the inhaling terrible virus which makes dangerous diseases. Masks are helpful to protect from the dangerous particles such as bacteria (0.1 to 10 µ), dust mite (0.05 – 25 µ), dust (0.05 – 100 µ),molds (1 – 75 µ), pet dander (0.05 – 25 µ), fumes (0.01 – 1 µ), pollen (0.35 – 250 µ), cooking smoke (0.01 - 1 µ), insecticide dust (0.5 – 10 µ), human sneeze (10 – 100 µ), smog (0.001 – 1µ), spores (3 – 40 µ), tobacco smoke (0.01 – 1 µ), viruses (0.005 – 0.3 µ), wood smoke (0.2 – 3 µ). Masks are helpful to filter these particles during inhaling. The primary role of face masks is to prevent the transmission of SARS-CoV-2 via respiratory droplets (World Medical Card, 2020). Wearing face masks is the only way to prevent the virus and so the World Health Organization (WHO) urging people all around the universe. Even it is important to warn masks but only around 44% are completely compliant in terms of wearing masks in all relevant situations (Alves, 2020).

PRODUCTION OF FACE MASK

Generally, face masks are single-use and deposable masks. These masks are produced any one of the polymers such as polypropylene, polyurethane, polyacrylonitrile, polystyrene, polycarbonate, polyethylene, or polyester (as cited in Fadare and Okoffo, 2020).

Fabric procurement

The non-woven fabrics are procured in bulk from the factory.

Pleats making:
The non-woven fabrics are inserted into a machine for making pleats.
Ultrasonic welding
The side of the pleats of the non-wowed fabrics are welded on each side of the masks with ultrasonic fast vibrations for reducing the indivisibility after the pleats are made.

Cutting
After the ultrasonic welding is over, the side welded non-woven fabric is sent to a cutting machine and make pieces to fit from nose to chin accordingly.

Filter sandwiching
The non-woven filter material and a flexible metal nose strip are sandwiched between the inner and outer layer of non-woven fabric.

Linking
The ear straps are cut and welded with the help of ultrasonic fast vibrations for strong bonding and they become structured masks.

Testing and sterilization
The linked masks are tested for damages and poor linking then it moves to the part of stylization. In the sterilization process, the mask is kept in a high-level ozone-filled chamber for sanitizing the masks.

Packing
Sanitized and undamaged masks are packed. Each package contains 10 or 100 masks.

Storage and dispatch
A box contains 100 packets. Sometimes it may be increased to 1000 based on the size of the box. The boxes are delivered according to the orders.

PERPLEXITY OF FACE AND SURGICAL MASK WITH RESPIRATORS

People are having thought that face masks and respirators are used for the same purpose. The confusion about this is right because both are covering the nose and mouths, and filtering the dust particles. Mask and respirators have covered the face. But the purpose of the respirator is different. Respirators are PPE and masks are not. Face masks are available in varieties like dust masks and surgical masks. Face masks are filtering the air at the surface of the mask, and surgical masks are called a medical mask which is made with 3 layers of non woven synthetic materials, filtration layer is sandwiched in the middle. Both face and surgical masks are available at various levels of thickness and filtration. On the other side, surgical and respirators are had the same protection value. But respirators are particularly used for health care professionals or workers who are working in the core area of Covid – 19 patients. Wearing the correct size of respirators is essential and loose in respirators leads dangerous particles like Covid-19 virus or any respiratory virus permission into lungs and it makes severe effects on the individual.

ADVERSE CONSEQUENCES IN THROWING USED COVID - 19 MASKS

Lim, Seet, Lee, Smith, Chuah, and Ong have conducted a study entitled Headaches and the N95 face-mask amongst health care providers and concluded that the health care developers may develop headaches following the use of N95 masks. Rosner surveyed the adverse effect of prolonged masks used by 343 health professionals and identified caused adverse effects such as headaches, rash, acne, skin breakdown, and impaired cognition. The impact of disposed of masks has made on all habitats has to be addressed and so the author of this article, write a brief about the issues of littering disposable masks in the succeeding passages.

Physical Issues
Wearing masks in the Covid-19 pandemic situation is important to secure our life from covid-19. Daily use of the masks can be possible to red rash, frictional acne, soreness, and rosacea due to the friction between the skin and the

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layer of the masks (University Hospitals, n.d.). The author of the paper realizes by continuous use of masks, the straps make the red-colored scar on the backside of the ears and it makes severe pain, erosion, and swelling. The key factor of breathing issues makes non-compliance in wearing mask mentioned by 50% and it was identified by a survey conducted by The Economic Times (Alves, 2020). The masks reduce the inhaling oxygen level and it may lead to headaches to the

The Land Fillings

Due to the caseload of Covid-19, people in India used cloves and masks are mixed with other wastes and it's putting their life at risk. Using a reusable mask reduces the mask wastages and it reduces the challenges of risks of the people and assists fewer challenges in removing the garbage by the cleaning servants. Though, India TV (2020, November 25) mentioned a point to reduce the skin diseases by a used Covid-19 mask that prefer a disposable mask which has lesser chances to get dirty. Today, the world facing the third wave of Covid-19 and yet has not stopped wearing masks. The increase of masks has reached the ceiling that the mask could be used in 10 years. The following few photographs were taken by the authors in Natchiar koil, Thanjavur District, Tamil Nadu State, India.

Figure.1 Warn Mask Thrown in Different Places (Author, 2021)



Hurting Domestic and Wildlife

A used covid-19 with not snipped ties of mask littered in the surroundings and they are stagnated in garbage warehouses seriously hurting animals. On the 10th of April 2020, at Chilliwack, BC, Canada, an American robin (Turdus Migratorius) entangled in a face mask is the first victim hurt by the Covid – 19 litter (Hiemstra, Rambonnet, Gravendeel & Schilthuizen, 2021).

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Figure.2 American Robin Entangled in a Face Mask (Denisuk, 2021)



The Covid-19 pandemic situation is not come to end, and the usage of face masks and respirators is increasing, and it will be bullying to all wild animals. Masks and respirators are saving the life but improper littering of the mask bulling the wild animals.

Figure.3 Bird Tangled with Straps of the Disposed of Mask (The World Bird Store, 2021)



A seagull's legs were tightened with elastic straps of the mask and the joints of its legs were swollen and sore. It was rescued by the Royal Society for the Prevention of Cruelty to Animals (RSPCA) and RSPCA shares tips to protect wildlife from litter (Sukheja, 2020). The pictures teaching us, a not strap snipped mask littered makes an impact on the wild lives and even to death.

Figure.4 Indian Domestic Hen Entangled in a Face Mask (Author, 2021)



A domestic hen entangles by the straps of used masks in their legs and this may make it uneasy to walk. Figure 3 shows the entanglement of the mask's straps in the legs of the hen and it was captured by the author.

Water Logging, Stagnation, and Pollution

Water is essential to all living beings and it is used directly and indirectly to us. All the creatures in this universe cannot live in the world. Consuming water is a basic process of all living things. A used and thrown mask in the waterway will log the continuous water flow and it makes severe problems to the living things. The polyester mask

takes hundred years to decompose (TRTWORLD, 2021). A lightly buried mask stagnate the water and it is not permitted to in-filter the water from the surface to the underground water channel. Even a heavy rainfall, the water is not permitted towards the littered mask because the mask, after some years the soil would be deposited in the filtering place. This stagnation will lead to lowering the underground water level.

Ocean Pollution

Now a day the ocean becomes a garbage bin due to the daily usage of masks and respirators. More than a million masks have been used and thrown away in a single day during the Covid-19 pandemic period. It affects ocean creatures. Edmond (2020) mentioned in the webpage of the World Economic Forum, 'Coranavirus waste has become a new form of pollution as single-use personal protective equipment (PPE) floods our ocean'. Release of large tones of micro-plastics to the landfills as well as the marine environment where mostly end up and thereby affecting their fauna and flora population vastly (Dharmaraj, 2021).

OVERCOME THE ADVERSE CONSEQUENCES

We cannot overcome the issues of disposable mask littering until the pandemic situation is not over. Littering masks make threatening all the habitats, mammals, and other creatures in the universe. Human beings have to consider that all other creatures having the right to live in the world. A thrown mask does not suffer and injuries to the creature of the world. The third wave of Covid-19 will be started in late August 2021, to October of this year (Perappadan, 2021) and it affects approximately 1 laksh child, an awareness message given by Samiran Panda, Indian Council of Medical Research [ICMR], New Delhi, India. This explains that there is no decrease in usage of masks and it increases. We cannot stop warn mask till the Covid-19 is stopped. But we can safely throw the used mask. Human is an intelligent animal and they have to follow the activities to overcome the threats forcing on the creatures in the universe.

Snipping straps

Mask users should ensure the straps of the used mask were snipped before disposing of it. Government should encourage and make awareness to 'Snip the Straps' of used masks to prevent the wild and domestic animals' parts of the body like nose, foot, and feather caught in them.

Use washable and reusable masks

To reduce the consequences of the used Covid-19 masks, people can use the mask to be usable and reusable. It is suggested that the reuse the masks in a safe way.

Use cloth masks

Use cloth masks instead of fabricated polythene masks can be reduced the single mask usage instead of more usage of fabricated polythene masks.

Put the used mask in a black bag

After using the face masks should be throw in a black bag or waste bin or litter bin and not throw in the recycling bin.

Store in a separate area

The used Covid-19 masks can be accumulated in a separate area and they can be destroyed or given to the health employee like a cleaner.

Separate dust bin

Government take an additional step to accumulate the worn mask from the people by putting separate dustbin, collect them and throw into a separate place to destroy and the place should be in the vicinity.

Awareness program

Awareness program in any social and mass media to snip straps of the mast, accumulate the mask in a separate place, and put the worn mask in a separated dust bin available in their area. Also, safely use a reusable mask can be insisted.

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