

Waste Management approach, Covid-19 and Gender inequality in Slums – A case study of Delhi-NCR region

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Abstract - India as a society, had a long-cherished tradition of cleanliness imbibed in its culture, beliefs and lifestyles but it promotes personalized cleanliness. Solid Waste Management is a major problem in India, where urbanization, industrialization, and economic growth have resulted in increased municipal solid waste (MSW) generation. Composition of waste varies for different gender and impact of waste management is experienced differently by different genders.

Composition of waste is not gender neutral, so is the Covid-19 pandemic. Waste management approach showed distinct impact on the transmission of COVID-19 among the Population living here. Poor waste management approach of people living in the posh upper-class society doubled the misery of slum dwelling population living on the fringes of capital cities. Nature is also biased when it comes to exposure, Women are biologically more exposed to waste due to their excretory processes and conservative society do not consider their different needs. Common sanitation practices infect a woman for various infection in comparison of men.

Methodology: A combination of qualitative and quantitative methodology has been used to conduct this research paper. A field survey has been conducted using google forms on a sample size of 104 respondents. Approx. 40 to 45 people are interviewed in two days field visit in bhalaswa landfill site. Each respondent interviewed for approx. 3-4 minutes via open and subjective questions. A thorough observation made to analyze the socio-economic and psychological perspective of the respondent.

Statistical Analysis: Data collected are analysed by google form, and converted into pie-charts representing various indicators.

In this Paper is an attempt to analyze the effect of waste management system on the trajectory of covidinfection and its varied impact on two distinct genders. The **main objectives** of present paper are to analyse the biological, cultural, social, economic biases based on gender in the slums of metropolitan cities. The key objectives of the paper are:

- To study the impact of waste management approach on the spread of covid-19 on the women living in slum of the NCR region.
- To study approach of waste management and understanding of waste segregation from perspective of gender Delhi-NCR.
- To find out difference in trend of covid infection among Men and Women living around landfill sites (Bhalaswa and Jahangir Puri)
- To check the level of sanitation and extent of covid-guidelines had been followed around the landfill sites.

Keywords: Gender, Waste-management, Covid-19, Disaster, Slum, Hazard, Epidemic.

I. INTRODUCTION

Culture of a nation influences the culture of its sanitation practices. India as a society had a long-cherished tradition of cleanliness imbibed in its culture, beliefs and lifestyles but it promotes personalized cleanliness. Poor waste management practices of people living the posh areas of cities creating a hell for already ignored piece of population in the form of landfill areas. A large compact settlement residing around mountains of waste itself questioning the mankind, but here also we can see a huge divide in two genders. Gender biases are observed in all class, cast, religion, eco-nomic background to some extent. But here in slum regions, poverty and high rate of economic dependence of one gender over other established the bias in the most brutal way. Like any other disaster, Pandemic too exposed this bias wide open. Life of one gender is being preferred over other in lack of resources. Both the gendered contracted this life-threatening disease but only got the privilege of getting it treated in lack of resources and societal orthodox. Gender bias appeared in its worst form during this Pandemic

Though both the gender exposed to the pandemic more or less equally, however, in the study area chosen for this paper, Male got more exposed to the infection while working on landfill lands, but economically, socially and biologically gender X always lacked some privileges over gender Y. According to a new analysis commissioned by UN Women and UNDP, by 2021 around 435 million women and girls will be living on less than \$1.90 a day — including 47 million pushed into poverty as a result of COVID-19 (UN Women 2020).

Nature is also biased when it comes exposure, Women are biologically more exposed to waste due to their excretory processes and conservative society do not consider their different needs. Common sanitation practices infect a woman for various infection in comparison of men.

Solid Waste Management is a major problem in India, where urbanization, industrialization, and economic growth have resulted in increased municipal solid waste (MSW) generation. Composition of waste varies for different gender and impact of waste management is experienced differently by different genders. Composition of waste is not gender neutral, so is the Covid-19 pandemic.

The population bloom, the improvement in living standards and COVID-19 pandemic in recent multiplied the challenges in waste management, especially in urban regions many folds. Municipal waste management and waste deposition acted as a major deriving factor in the spread of infection. The impact and composition of solid waste management varies from gender to gender and this indirectly effect disease transmission and its consequences on men and women differently.

For proper waste management, we should ensure effective segregation of waste at source and also make sure that these go through various streams of recycling. But unfortunately, we live in an ignorant society. We have luxury of dumping sites away from our beautiful homes and hence, we created extremely dangerous environment for rag pickers, manual segregators on the dumping sites and people living around the landfill sites.

Segregation is least practiced in India specially in Delhi (almost negligible). Wastes are dumped unsegregated, unprocessed on the landfill sites by municipal vehicles. This surely, impacted the transmission of COVID-19 among the Population living here. Changed waste composition such as huge number of masks, protective gears, bottles of sanitizers, PPE Kits etc in lack of proper segregation and disposal technique turn out to be extremely hazardous for environment along with Humans as well.

In this Paper, we will analyze the effect of waste management system on the trajectory of covid infection and its varied impact on two distinct genders.

II. LITERATURE SURVEY

UN Women (2020) published a report under title, “**Gender equality in wake of covid-19**” stated that while men have higher fatality rate, Women and girls are especially hurt by the economic and social fallouts. The shift of funds to pandemic response is hampering the women’s access to sexual and reproductive health. The analysis commissioned by UN women and UNDP also mentioned a case study of Europe, where women from marginalized economic group (black women) reported more deaths which is 4.3 times higher than the white women.

Goal 11 paper (2020) in the analysis paper, “**Harsh realities: Marginalized women in the cities of developing countries**” produced by UN women and UN-Habitat showed that Covid-19 cases were highest in East Africa in slum of Kibera, where 116 women over 100 men tested positive. The paper highlighted that woman in slum are suffering much worse than male slum and female non-slum counterparts in access to employment, health facilities, secure housing and education. The paper mentions, “Most women in slums work, but it tends to be low-paid, temporary, strenuous and exploitative, making them more likely to be ‘working poor’ (employed but earning less than \$1.90 a day). Many are domestic workers who can’t render services remotely, thereby losing income that enabled them to feed their families. For example, in Brazil, within the first month of the pandemic, 39% of domestic workers had been fired without payment. In India, millions of women casual workers and their families have been stuck in cities without any income or food.”

Azcona et.al (2020) in the paper, “**Covid-19 exposes the harsh realities of gender inequality in slums**” showed 80% of the households in slum lacks access to safe handwashing and sanitation facilities. Where, women and girls collects water for the households, go to crowded community pumps or unprotected water bodies, take care of the sick member, take young children to latrines which increase their vulnerability to the infections through public interactions and being on a unhygienic place for long time.

III. OBJECTIVE:

- To study impact of waste management approach on the spread of covid-19 on the women living in slum of the NCR region.
- To study approach of waste management and understanding of waste segregation from perspective of gender Delhi-NCR.
- To find out difference in trend of covid infection among Men and Women living around landfill sites (Bhalaswa and Jahangir Puri)
- To check the level of sanitation and extent of covid-guidelines had been followed around the landfill sites.

IV. RESEARCH METHODOLOGY:

- A combination of qualitative and quantitative methodology has been used to conduct this research paper.
- Various literature reviews from journals, articles, UN Women, UNDP and various research papers are taken as reference to find out the most suitable and appropriate methodology for our field survey.
- Studied analysis reports to collect qualitative data.
- Among quantitative methods survey has been conducted using google forms on a sample size of 104 respondents.
- Approx. 40 to 45 people are interviewed in two days field visit in bhalaswa landfill site. Each respondent interviewed for approx. 3-4 minutes via open and subjective questions.
- A thorough observation made to analyze the socio-economic and psychological perspective of the respondent.

V. DATA BASE:

The data used for this field report mainly comprises of two types of data as follows-

- Primary data collected from field survey using questionnaires (google forms), interviews and observations.
- Secondary data collected from Municipal corporation of Delhi, UN Women reports, ndma.gov.in and health.delhigov.nic.in etc.

VI. STUDY AREA:

Data for this paper is collected from the Delhi-NCR region focusing on Karol bagh, Bhalaswa and Jahangirpuri landfill area. New Delhi is one of the 8 union territories and also the capital of India. It is located in northern India between the latitudes of 28°24'17" and 28°53'00" North and longitudes of 76°50'-24" and 77°20'37" East. It shares its boundaries with the States of Uttar Pradesh and Haryana. It has an area of 1,483 sq. kms. Its maximum length is 51.90 kms and greatest width is 48.48 kms. It is comprised of 11 districts with a total population of 1.9 crore. Bhalaswa – Jahangir puri lies on the fringe of the city which carries Delhi's most of the waste. It is governed by Municipal Corporation which comes under Delhi Metropolitan Region. The Bhalaswa Jahangir Pur city is located in Delhi state of India. As per provisional reports of Census India, population of Bhalaswa Jahangir Puri in 2011 is 197,148; of which male and female are 106,388 and 90,760 respectively. (Census of India 2011).

VII. SIGNIFICANCE OF THE STUDY:

This study is about the impact of waste management on the outbreak of pandemic in special context of gender. Findings and suggestions of this study definitely help in better mitigation of upcoming pandemic like situation and will help in highlighting loopholes and irradicating gender biases are being practiced knowingly or unknowingly in the management of current crisis. This study clearly points out various minor and major mistakes we are doing in waste management in current scenario and ignoring the impact of poor waste management can bring numerous hurdles in the way of containing the infection. Overcoming these mistakes will surely bring a change in future.

VIII. RESULT AND ANALYSIS:

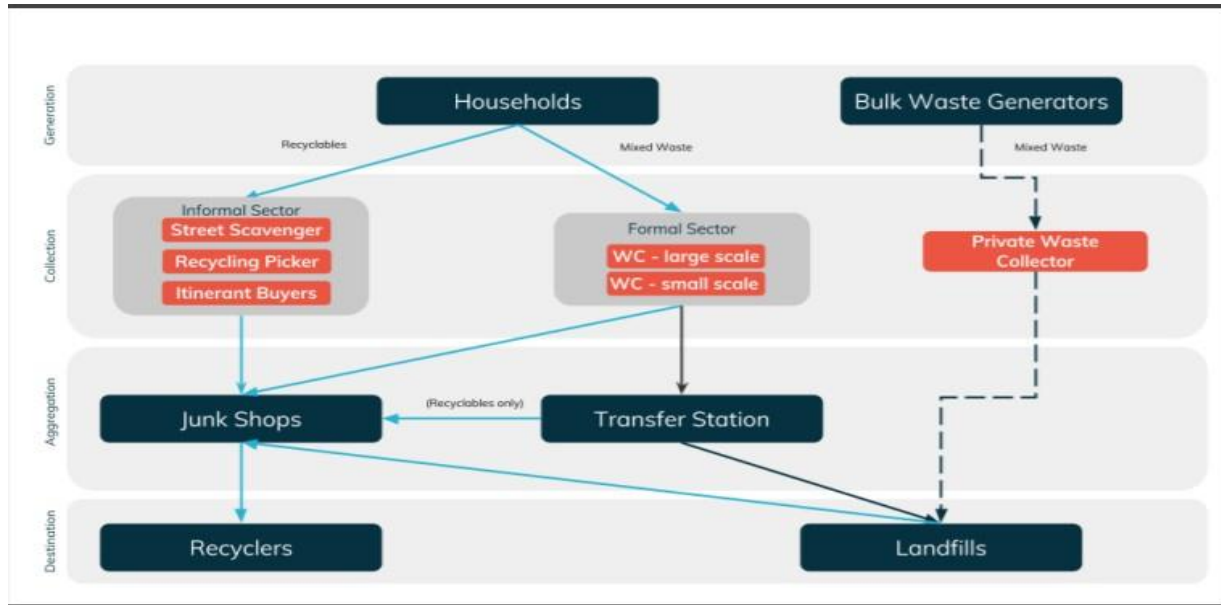
Every disaster shows a differential impact on different gender, class, age etc., Covid is not an exception. Gender is crucial element of any management plan, which we neglect most of the time. The outbreak of COVID-19 pandemic has emerged as a major challenge from human health perspective. The alarming exponential increase in the transmission and fatality rates related to this disease has brought the world to a halt so as to cope up with its stern consequences. This Pandemic culminated in escalating biomedical waste (BMW) worldwide and the management authorities are struggling with waste treatment. The unexpected fluctuations in waste composition and quantity also require a dynamic response from policymakers. But along with that, we also have to consider its differential impact on different gender as these issues are not gender neutral.

Delhi is the central attraction for so many and is believed to be an idol place for the rest of the India, in terms of urbanization, modernization, industrialization, and more importantly as an area under the smart city mission. But so far this looks like only a fake image because the truth is far more bitter as when we go to explore the place, its beauty is chained to the garbage disposed everywhere and anywhere. Delhi's waste management system has a large expanded informal networks with a reasonable participation of women.

Ministry of Environment, Forests & Climate Change (MoEF&CC) notified MSW (Management and Handling) Rules, 2000 and the revamped Solid Waste Management Rules in 2016 to ensure proper solid waste management in India. Various initiatives are being taken in different parts of the country, but an approach from the perspective of gender is still lacking.

This chapter of the presented paper construct the analysis from the primary data collected by the field survey,

Source: Role of Gender in waste management; Article by Ocean conservancy



draw result with the help of 104 responses on the google form and near about interviews of 100 people to observe the various factors affecting the spread of epidemic like Covid-19 related to Solid waste management and its impact on different gender.

• **Waste management and the Misery:**

Solid Waste Management Rules, 2016 delineate the responsibility of the different stakeholders including the MoEF&CC, Ministry of Housing and Urban Affairs, (MoHUA), Central Pollution Control Board (CPCB), State Pollution Control Boards (SPCBs), State Urban Departments, Urban Local bodies, Gram Panchayats, as well as the waste generators.

The key components of SWM system include the following:

Stage 1: Segregation of waste-by-waste generator into dry and wet waste.

Stage 2: Door-to-door collection of waste and transportation of segregated waste.

Stage 3: Setting up of material recovery facilities for dry waste to recover recyclables like plastic, paper, metal, glass, etc.

Stage 4: Setting up of waste processing facilities, viz., compost, bio methanation and waste-to- energy plants for resource recovery and energy generation.

Stage 5: Setting up of waste disposal facilities – Landfills.

Currently, waste management in Delhi only rely on stage 5, skipping all prior 4 stages. Segregation is least practiced in India specially in Delhi (almost negligible). Wastes are dumped unsegregated, unprocessed on the landfill sites by municipal vehicles.

Poor waste management practices of people living the posh areas of cities creating a hell for already ignored piece of population in the form of landfill areas. This directly implies that, a economically upwelling class of a society creating life threatening hazards for marginalized and ignored section of the society who are compelled to live on the waste of the so called upper class. A large compact settlement residing around mountains of waste itself questioning the mankind, but prominently evident gender biases screaming out loud in these areas making it worse.

Disaster and Gender Inequality: Challenges varies from Class to class

Gender biases are observed in all class, cast, religion, eco-nomic background to some extent. But here in slum regions, poverty and high rate of economic dependence of one gender over other established the bias in the most brutal way. Like any other disaster, Pandemic too exposed this bias wide open. Gender bias appeared in its worst form during this Pandemic

Though both the gender exposed to the pandemic more or less equally, however, in the study area chosen for this paper, Male got more exposed to the infection while working on landfill lands, but economically, socially and biologically gender X always lacked some privileges over gender Y.

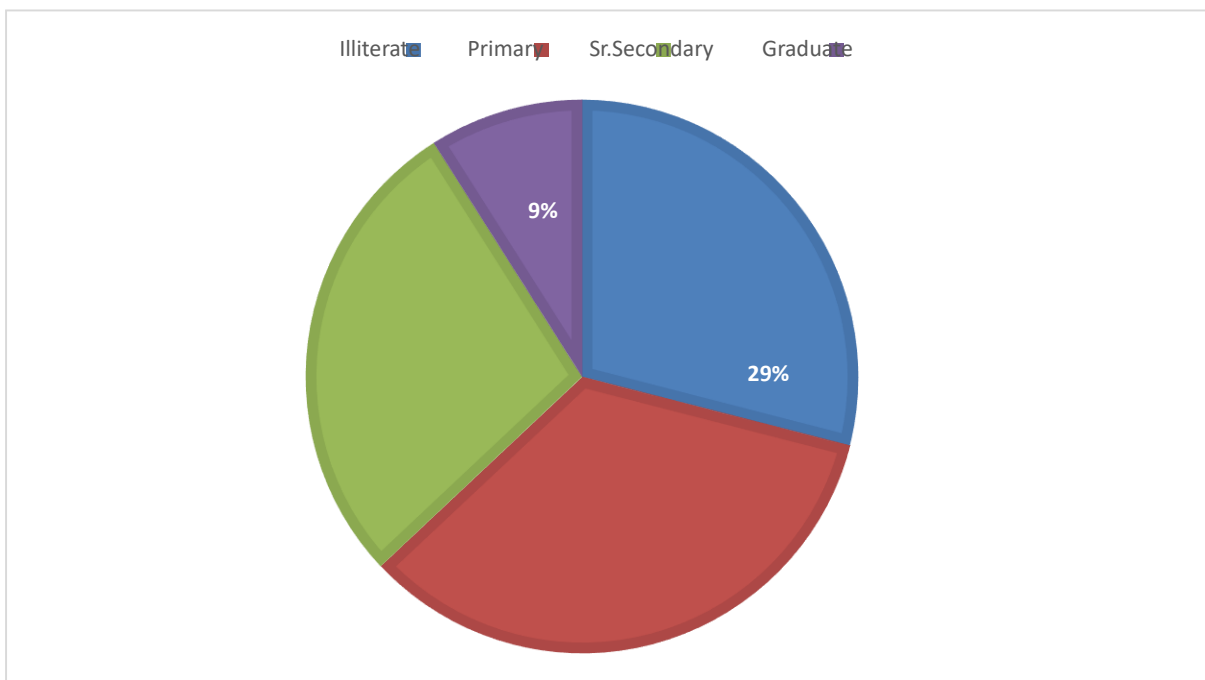
• **Data Analysis: Field Survey**

• **EDUCATION QUALIFICATION**

High literacy rate is a major indicator of development of a region and level of awareness about various disasters and epidemics in a region. New Delhi is a city with moderate to high literacy rate. Literacy rate of New Delhi is 86.21 %. In New Delhi, Male literacy male and female literacy were 93.84 % and 88.01 % respectively. (Census of India, 2011)

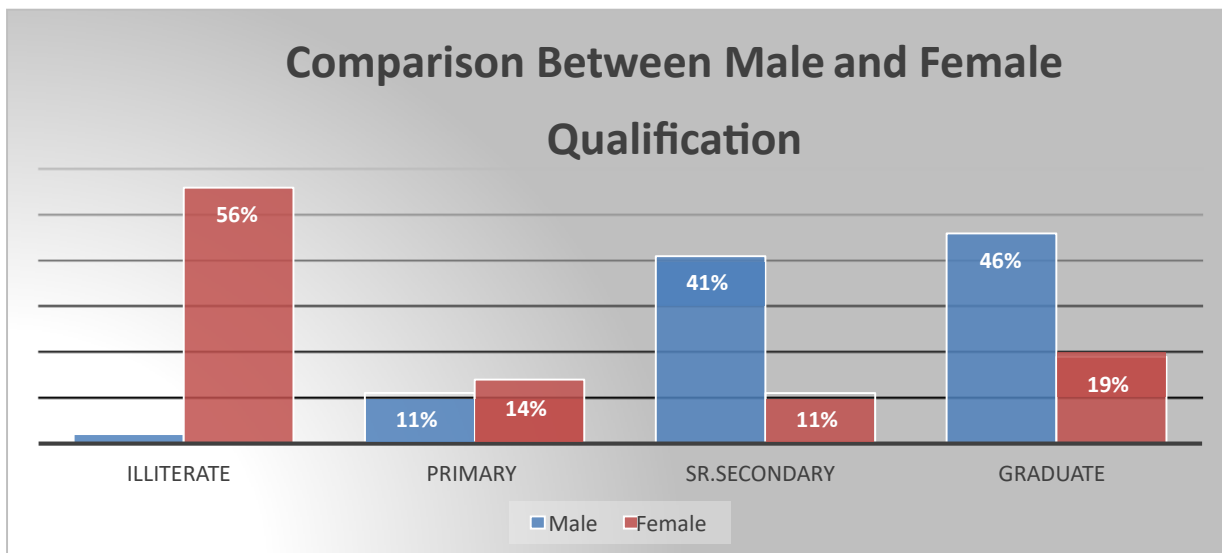
In our survey, out of 104 respondents 12% of the respondent were Graduates and 39% of respondents were illiterate which indicates the low to moderate literacy composition of the region. Where 34% are found to be dropout after primary level and 29% reached to the sr. secondary level.

FIGURE.1 PERCENTAGE DISTRIBUTION OF LEVEL OF EDUCATIONAL QUALIFICATION



Source: Primary survey

When we compared the literacy of male and female respondents, we concluded that, Female are deprived from the education here but new generation is educating itself.

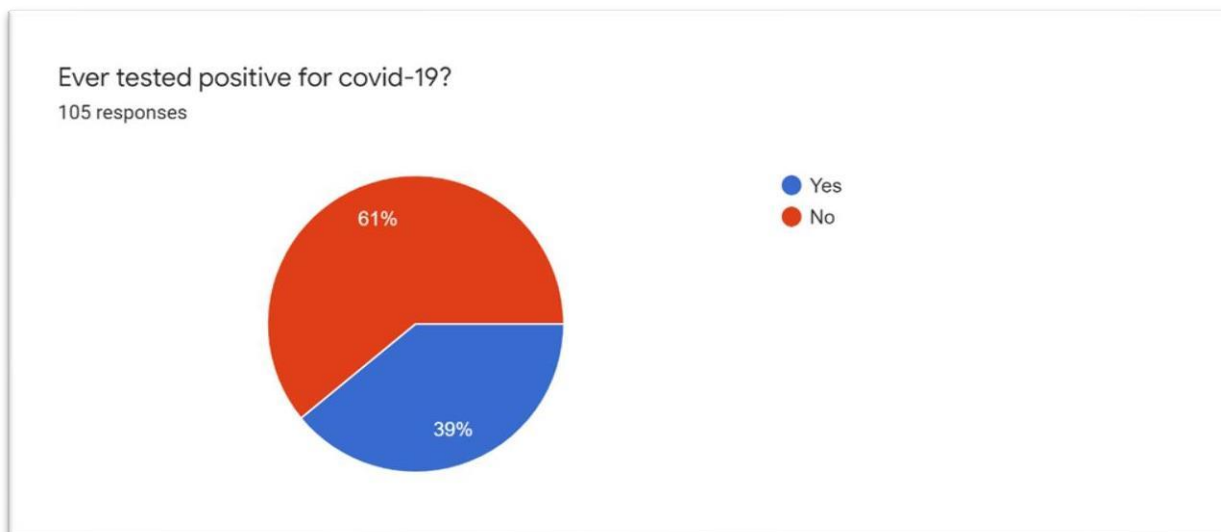


Source: Primary survey

• EXPERIENCE OF GETTING INFECTED WITH COVID:

This pandemic left no one unaffected. Directly or indirectly, it impacted every single citizen of this country on varying scale. Among 105 responders, 64 of the responders tested positive for the covid-19. According to them, this is worst kind of illness they ever experienced in their lifetime.

FIGURE 2. PERCENTAGE OF COVID-19 POSITIVE RESPONDENTS.



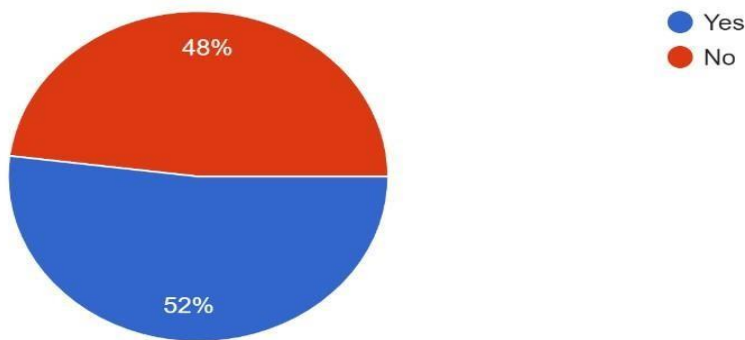
Source: Primary survey

52% of the total responder admitted they experienced this horror by watching their family members dealing with this illness. Many of them admitted they came back from the mouth of the death and experienced severe illness.

FIG .3 PERCENTAGE OF RESPONDERS WHOSE FAMILY MEMBER GOT INFECTED.

Any of the member in the tested positive for covid-19?

100 responses



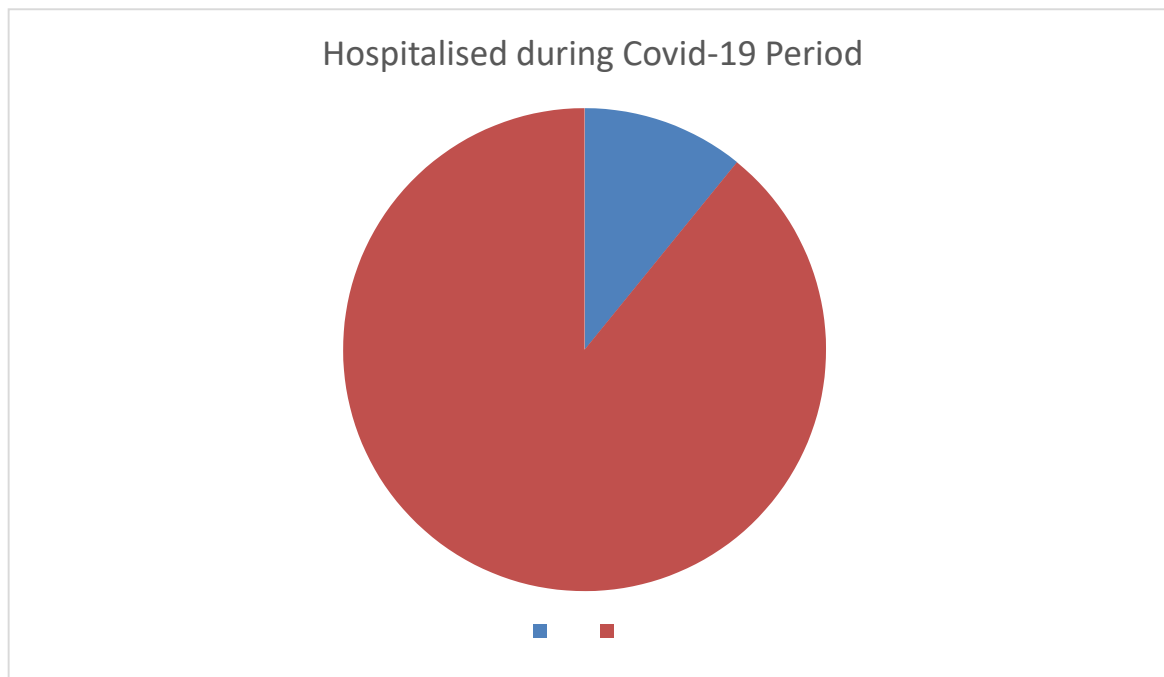
Source: Primary Survey

Getting infected and getting exposed to the infection holds same amount of threat to the life. Many non-covid severe illness like heart attack, accidents, cancer etc needed equal attention

and urgent hospitalisation which highly exposed them to the covid-19 and made them vulnerable to the disease.

Here, level of hygiene and sanitisation played a crucial role in order to contain the infection and stop the spread to the non-covid patients.

FIG. 4 PERCENTAGE OF NON-COVID ADMISSION IN THE HOSPITAL.

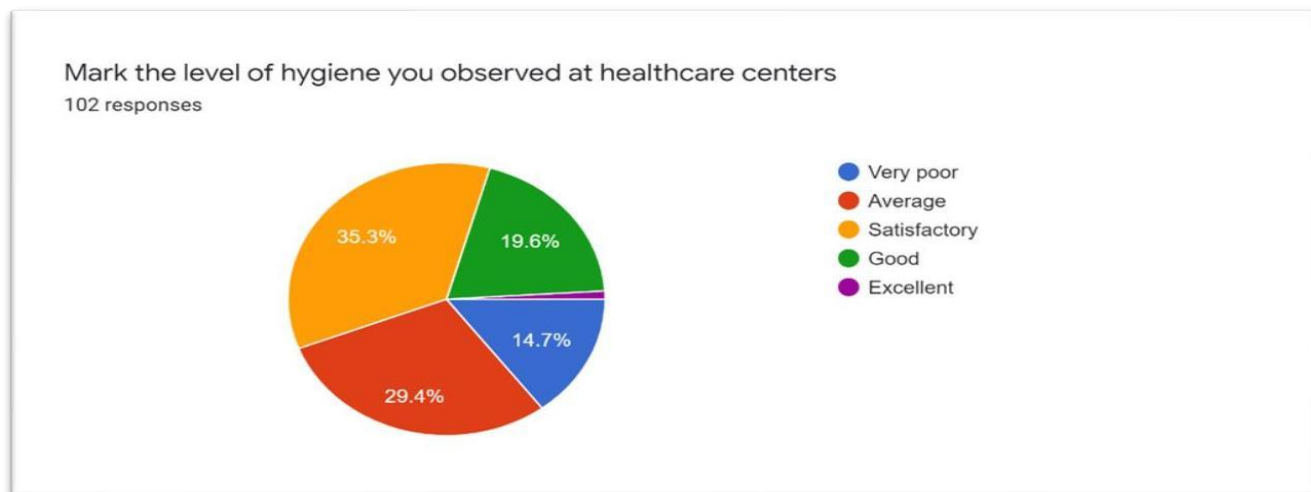


Source: Primary Survey

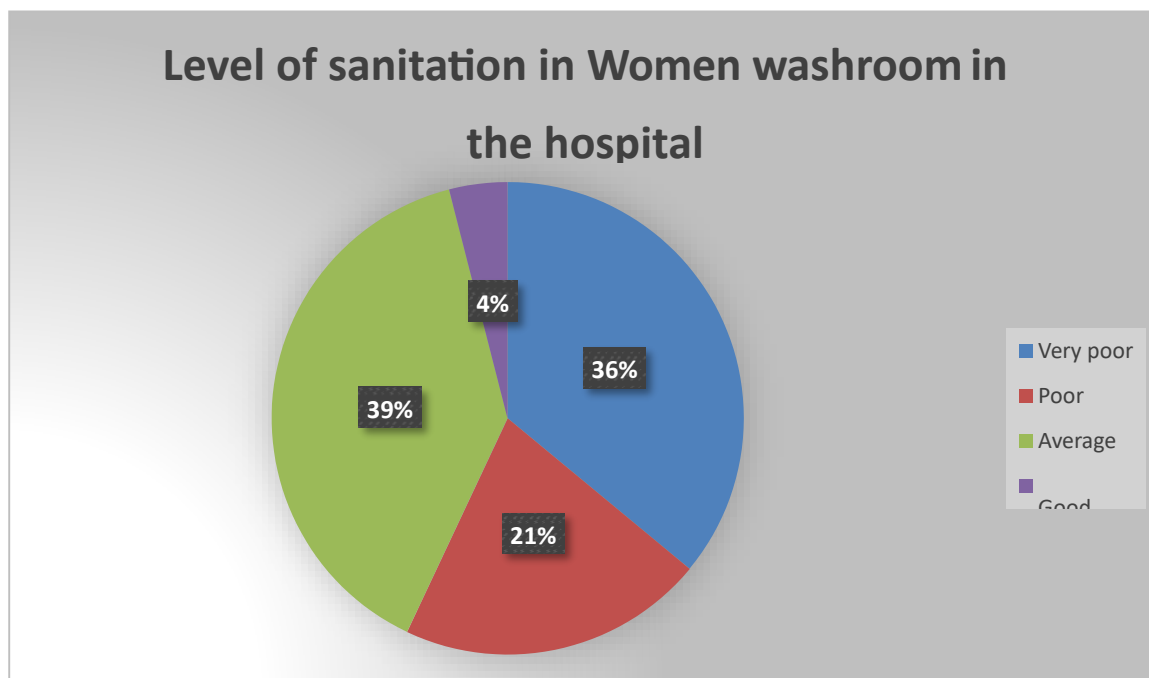
•LEVEL OF SANITATION IN HOSPITALS

As COVID-19 is a communicable disease and spread through droplet infection and can infect after coming in contact with the residue of the covid-19 patients, it is crucial to dispose the residue like PPE-Kit, Mask, Gloves, urine and faeces of the bed ridden patients, continuous sanitization of the surrounding. In this survey, Majority of the respondent which is 35.3% of the total responders were appeared satisfied with the sanitization level in the hospitals while 14.7% admitted they observed very poor sanitation and no social distancing.

FIGURE 5 LEVEL OF HYGIENE IN HOSPITALS.



Source: Prepared by Surveyor



Source: Prepared by Surveyor

• **AWARENESS LEVEL ON SOLID WASTE MANAGEMENT:**

Solid Waste Management Rules, 2016 delineate the responsibility of the different stakeholders including the MoEF&CC, Ministry of Housing and Urban Affairs, (MoHUA), Central Pollution Control Board (CPCB), State Pollution Control Boards (SPCBs), State Urban Departments, Urban Local bodies, Gram Panchayats, as well as the waste generators. Whereas MoHUA, State Urban Departments and Local Bodies have mainly been entrusted with the responsibility of development of infrastructure related to waste management, MoEF&CC, CPCB, SPCB, and Pollution Control Committee (PCC) have been entrusted with the responsibility of monitoring the enforcement of the Rules. The key components of SWM system include the following:

Stage 1: Segregation of waste-by-waste generator into dry and wet waste.

Stage 2: Door-to-door collection of waste and transportation of segregated waste.

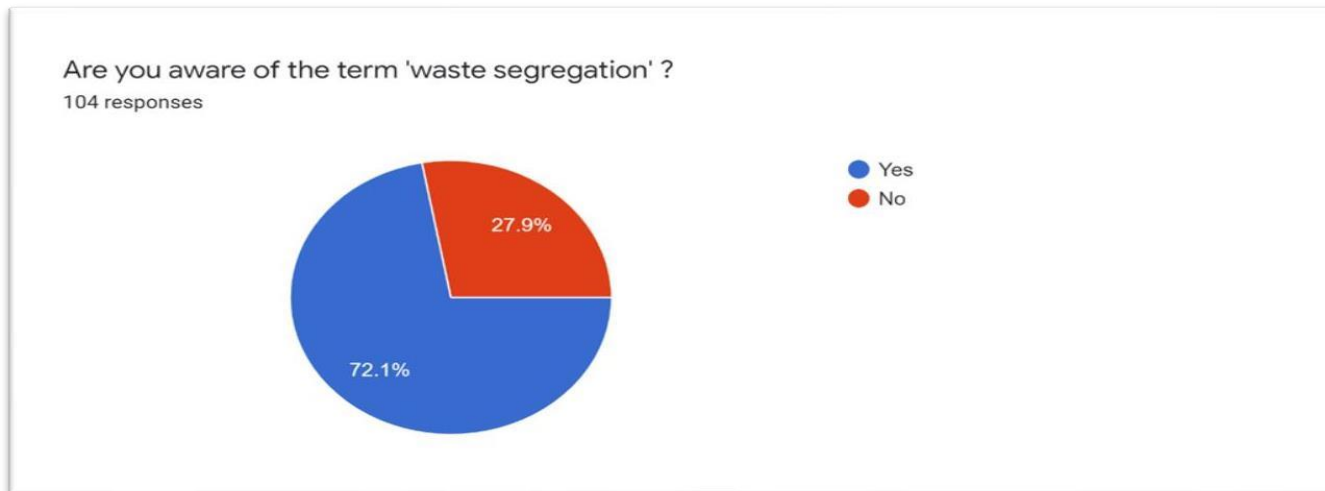
Stage 3: Setting up of material recovery facilities for dry waste to recover recyclables like plastic, paper, metal, glass, etc.

Stage 4: Setting up of waste processing facilities, viz., compost, bio methanation and waste-to- energy plants for resource recovery and energy generation.

Stage 5: Setting up of waste disposal facilities – Landfills.

During Covid -19, Waste Management emerged as a major challenge, specially, on the part of awareness. In this survey, Majority of the responder appeared to be aware of waste segregation, its methods and significance. 72% of the respondents said they are aware of the waste segregation.

FIGURE .6 AWARENESS ABOUT THE WASTE SEGREGATION.

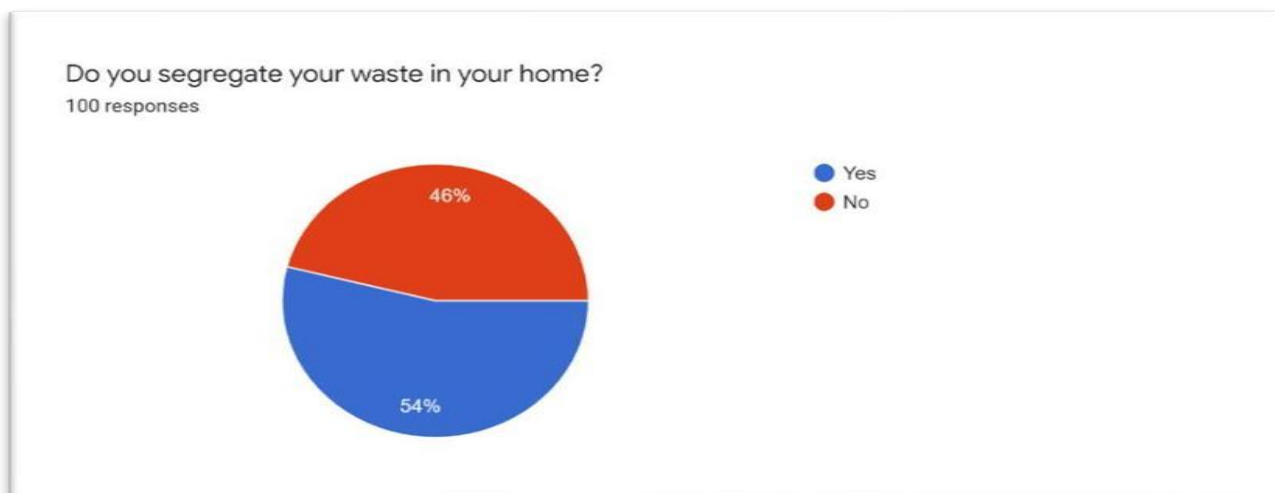


Source: Primary Survey

In a situations like pandemic, it is crucial to segregate waste and dispose covid related waste separately in order to contain the infection. Poor waste segregation can lead to further outbreaks of other epidemics. According the survey, only 54% people segregate the waste, rest skip this crucial aspect of waste segregation.

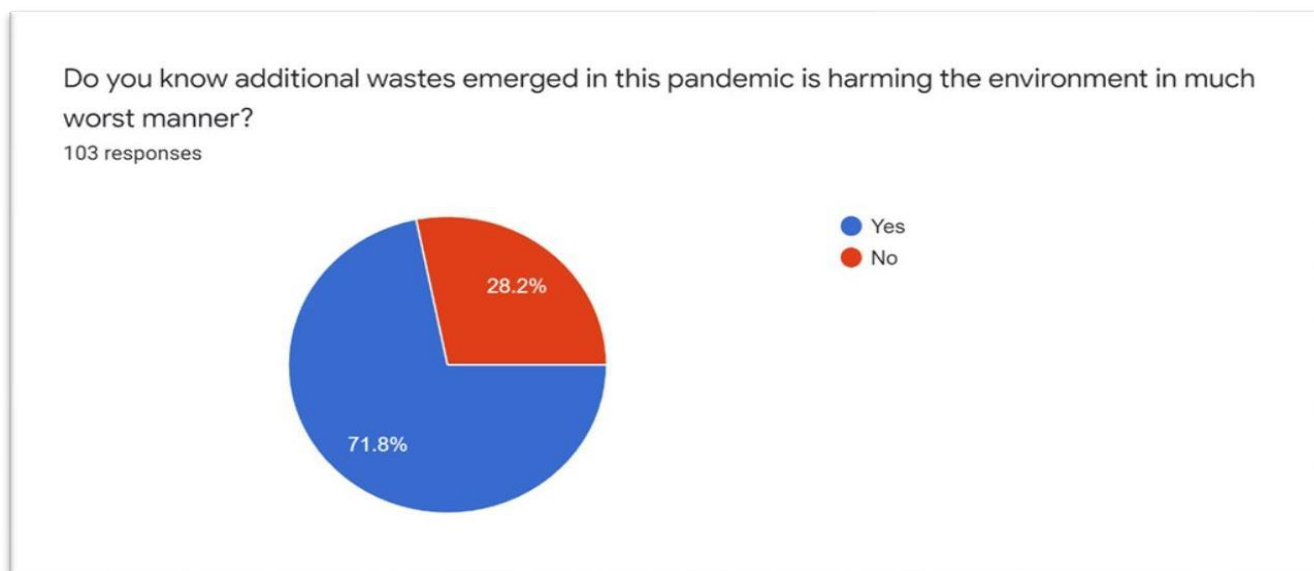
The survey also collected the data to observe the level of awareness about the impact of covid related waste on the environment and climate change. Here, we can see that people are quite aware about the consequences of covid related waste on the environment.

FIG..7 PERCENTAGE OF PEOPLE SEGREGATE THEIR DOMESTIC WASTE.



Source: Primary Survey

FIG. 8 AWARENESS ABOUT THE IMPACT OF THE COVID RELATED WASTE ON THE ENVIRONMENT.



Source: Primary Survey

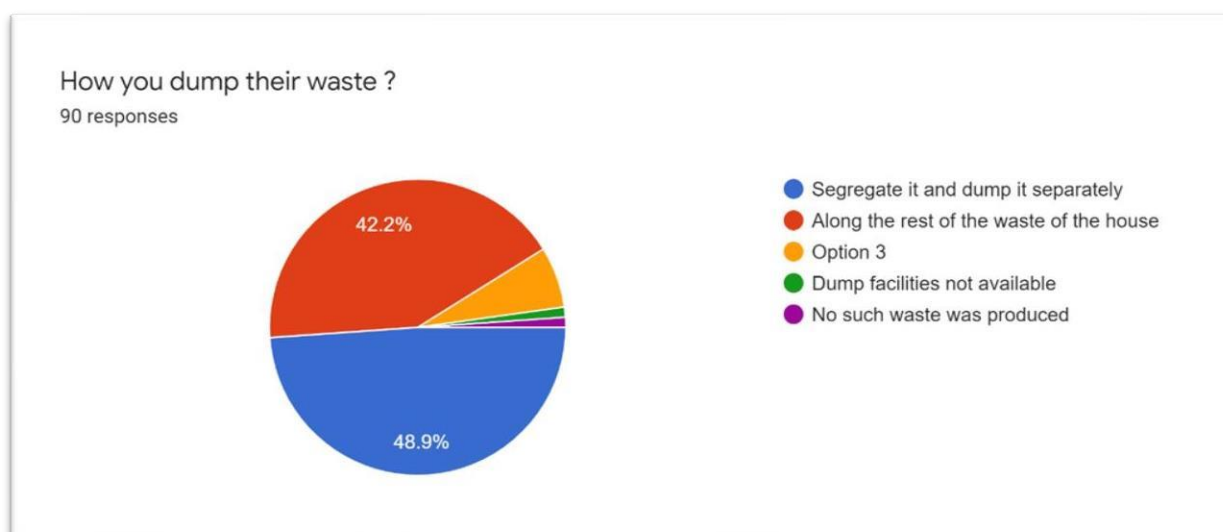
•DISPOSITION OF COVID-19 RELATED WASTE:

In this survey, we observed that 48.9% segregate covid related waste from the normal waste but approximately same number of people which is 42.2 % don't segregate this waste.

Surveyor also interviewed a Sanitation worker. According to sanitation worker, “waste segregation at home does not impact much as there is no provision of separate vehicle

for the waste collection. So, whether you collect waste or not doesn't make any significant difference.”

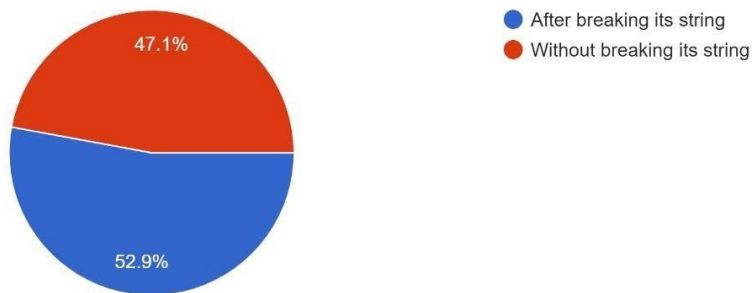
FIGURE .9 METHODS OF DISPOSITION OF COVID RELATED WASTES USED IN THE HOUSE HOLDS.



Source: Primary Survey

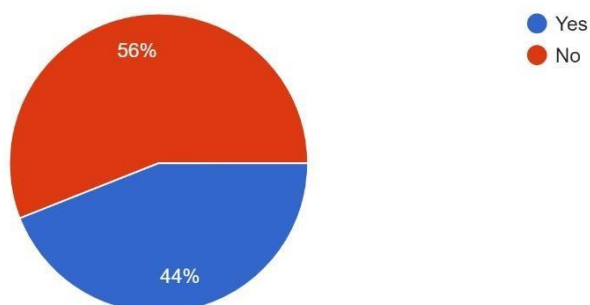
How you dump your mask ?

104 responses



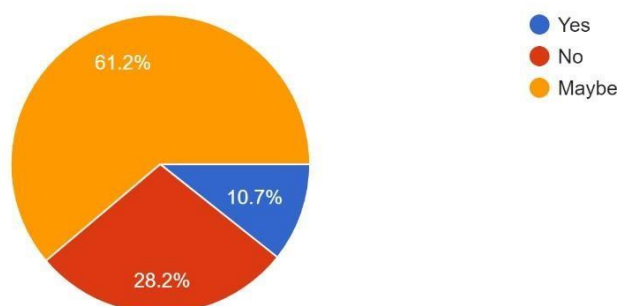
Do you sterilize you covid safety kits like PPE, Mask , Hand gloves before dumping it in the garbage?

100 responses



Do hospitals sterilize its waste before dumping ?

103 responses

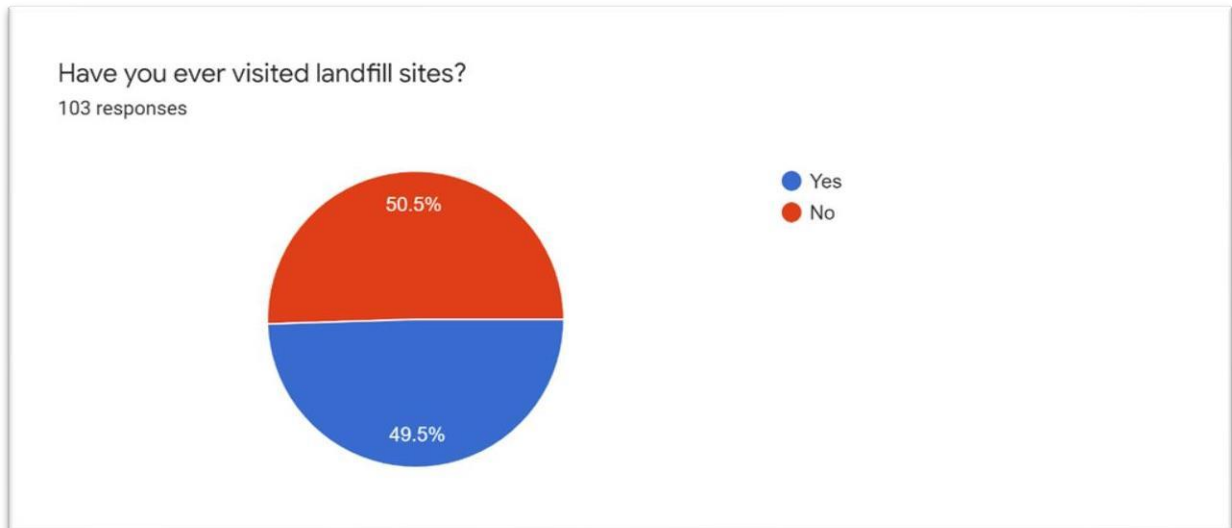


•SAFETY MEASURES ON LANDFILL SITES:

Safety of hand-pickers and sanitation workers needed an extra attention. They can't afford PPE- Kit, expensive sanitizer etc as a safety equipment against infection. They generally observed segregating wastes at landfills with bare Hands violating all the safety measures for covid. This can lead to a large causality and a dangerous outbreak of various epidemics among the people living in the slum.

In this survey, Respondents stated that they witnessed many wrag-pickers working on landfill sites working bare hand, not even using sanitizer or handwash regularly. But about 71% of them are wearing their masks but not properly.

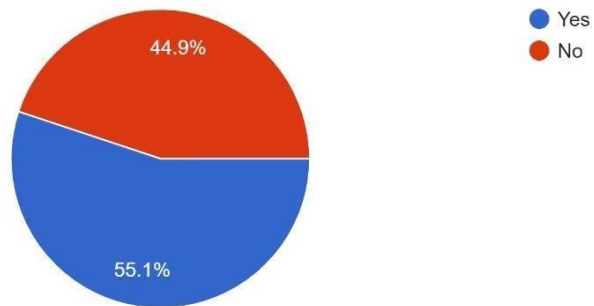
FIGURE .10 PERCENTAGES OF RESPONDENT VISITED TO LANDFILL SITES.



Source: Primary Survey

Have you seen hand pickers at the landfill sites?

98 responses



Have they followed safety guidelines for covid?

96 responses

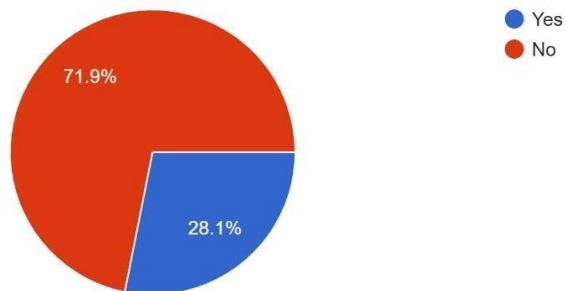
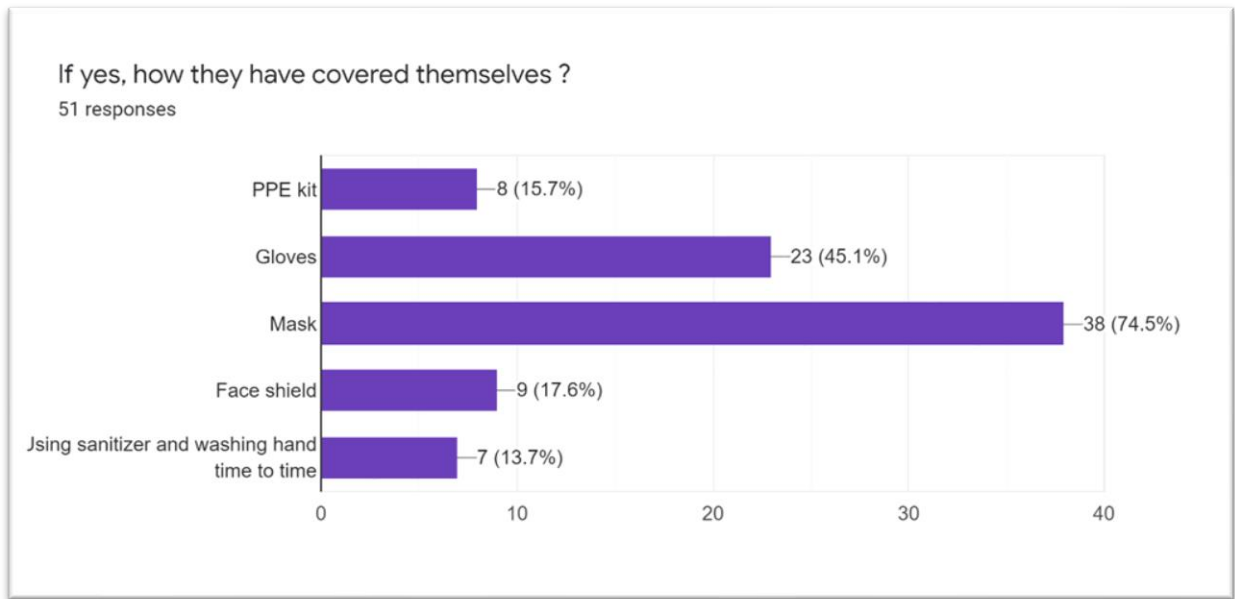


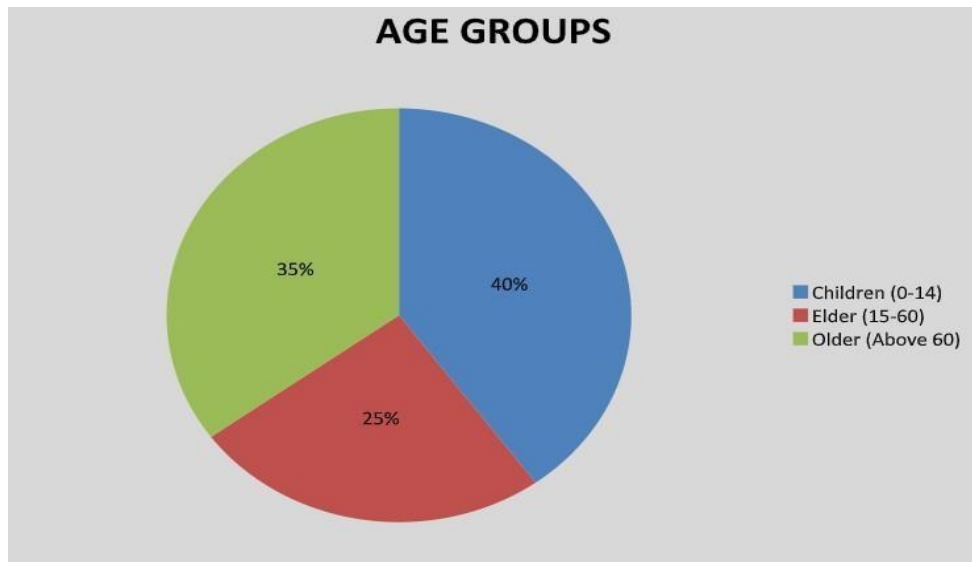
FIG..11 SAFETY MEASURES USED BY LANDFILL WORKERS DURING COVID.



Source: Primary Survey

• **MAJOR HEALTH ISSUES OBSERVED AMONG PEOPLE LIVING AROUND LANDFILL SITES:**

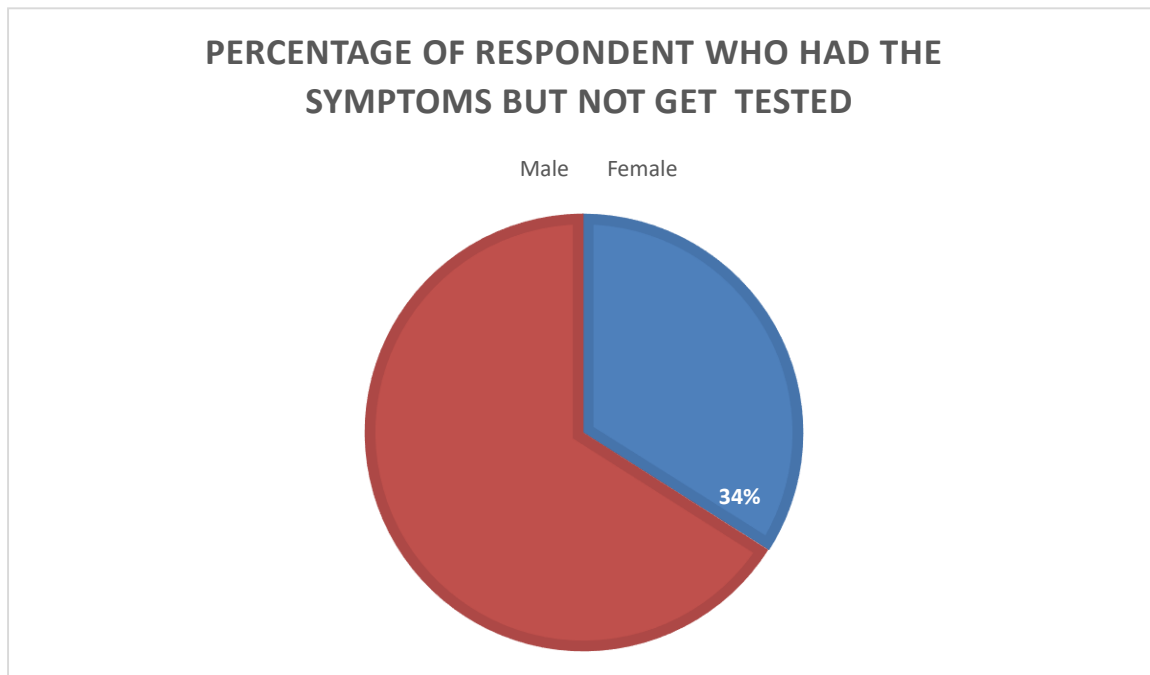
Along with the survey using questionnaire, Landfill worker living in the slum area of Bhalaswa and Ghazipur also interviewed for a wider picture. In our survey, we found that children who were in age group of below 14 were maximum affected and the elder who were in age group of 15-60 were minimum affected. We found one more thing that the people who were living near the Bhalswa dumping site in slum areas were not aware about health impact.



Source: Primary Survey

• **RESPONDENTS WHO HAD THE SYMPTOMS BUT NOT GOT TESTED:**

Many people had the symptoms but not got tested due to various regions like ignorance, social insecurity, inaccessibility of the resource or other issues. Among all the respondents, 53% admitted that they had the symptoms but not got tested for covid. Among these, majority of 66% were women who did not got tested mainly due to two reasons: inaccessibility and social insecurity.



We talked to almost 100 people who were living near dumping site and we found that 99 people were saying that they are not facing any problem in term of health, only one woman said that she and many of them are facing problem in term of health like skin problem, breathing problem etc. When we visited in societies near the Bhalswa dumping site and talked to people, we found that they people were also facing various problem like joint pain, cough problem, neurological problem, difficulty in breathing mainly in rainy season, itching etc. Along with this many women admitted that they were suffering from some kind of reproductive health issue and urinary disease. We found that there were lots of problem due to Leachate. Last residue of all waste called **Leachate** is highly toxic. It reaches nearby grounds through capillary motion and contaminates soil and ground water. Crops grown on those fields are unfit for consumption. If we consume this, it leads to serious health hazards ranging from abdominal pain to memory loss. If animal consume these plants, we in turn will get affected by their consumption. These co-morbidities can directly impact the fatality level of covid and its spread.

This can eventually affect the working of health system during a situation like pandemic. People living in these areas are already weak and suffering from many comorbidities which make them much more vulnerable to any epidemic, especially women who are more exposed due to low sanitation level around. Condition of these landfill sites are degrading every day, leading to creation of a hotspot of various pathogens and can lead to a large outbreak of epidemic in near future.

IX. SUMMARY AND SUGGESTIONS

Pandemic overburdened the already over-burdened waste management system of Delhi. Each of us generates waste flagrantly, without thinking of the repercussions at the macro scale. Delhi is responsible for 85% of the pollution of the Yamuna. Most of the major and minor drains dump untreated sewage directly into the Yamuna, with the Najafgarh and Shahdara drains together contributing to about 80% of such waste. This untreated municipal waste leads to eutrophication, which causes a rise in hyacinth, algae and other hazardous pathogens. Due to biological framework, Women are any way more exposed to infectious disease. In period of highly contagious covid-19 pandemic, Women are at tremendous risk of contracting the disease due to many reasons like low immunity, many deficiencies, other co-morbidities, lack of safe sanitation facility, especially in the hazardous environment like landfill sites.

This paper conducted a survey on 105 respondents living in the close proximity of landfill sites and interviewed 100s of people living around landfill sites, hospitals and on the fringe of the city to observe the impact of the poor waste management on men in comparison of women and compare the vulnerability of Male and female living near to the garbage sites.

MAJOR FINDINGS:

- Literacy is moderate to low but People are well - informed and aware.
- Unresponsive and ignorant authorities are increasing the vulnerability of the region.
- Gender is nowhere in the scenario while managing the waste and covid.
- **Women in slums was working as house helps before pandemic**, they lost job in pandemic and hence, got depended on the husband's income.
- Most of the respondent hail from labor class and small-scale businesses.
- Community help is more accessible than government aid during epidemic like situation.
- New Delhi needs to establish other landfill sites as the existing sites are overfilled and over burden.

- Health facility is satisfactory in the region.
- Sanitation facility for children and women are very poor.
- People are aware about basics of protection measures but don't follow it.
- Very few of the respondent wore the mask.
- Women is not the decision maker and can't sustain if head of the member dies.
- Most of the landfill workers and rag pickers are unauthorized.
- Health condition of the women are heavily neglected in the family.
- Most of the people blamed the administration for not providing enough safety kits to landfill workers and sanitation workers.
- There is vast difference in opinion of literate and illiterate people is observed. Literates are very aware and those are illiterate are found nil on information regarding Pandemic and waste management. Hence, here literacy plays major role.
- Some people, especially men of the family appeared to be misguided and misconstrued regarding the pandemic and they seemed very ignorant, though women took it Littlemore seriously but eventually they follow the male members of the family.
- Major fault in the disfunction of waste segregation and waste treatment was found at the administrative level.
- Government co-ordination with the people and local administration found poor.
- Head member of most of the house hold work on or around the landfill site and can be carrier for the other member of the household.
- There is no spare rooms available in their households to isolate the infected person. They are compelling to live with covid positive member.

SUGGESTIONS:

- More awareness programmes are required for older-age group, illiterates and women.
- Government should work towards establishing more waste treatment plants.
- Women centric waste management plan is required.
- Government needs to decrease economic dependency of women by generating employment opportunities, introducing skill development programs, creating safety net, educating them about their medical rights and facilities.
- Clean and safe sanitation facility for women is required to contain the infection.
- Open de-faecation and urination is still in practice in this area.
- Health checkup camps are required for women in order to treat their other co-morbidities.
- Immediate rehabilitation of people living around the landfill sites are needed.
- Law and order take in charge of removing illegal workers, working without any safety measures, who don't have any detail registered for tracking them during a situation like pandemic.
- They need to install Arogya's app to track their health status.
- A large vaccination drive required on priority basis around these sites.
- Knowledge gap of information regarding waste management and pandemic between literate and illiterate should be minimize by the co-lateral effort of youth and administration.
- Delhi urges new dumping sites on the highest priority.
- Authorities need to analyze that these areas are not suitable for settlement, hence take serious steps to stop increasing settlements around this area.
- A serious collective effort of people, Bureaucracy and government needed to deal with this upcoming crisis which is very near to our future.

X. CONCLUSION:

With the number of Covid-19 infections rising over the past several weeks, the city is facing a massive surge in biomedical waste. This survey is mainly performed to analyze the differential vulnerability men and women living in the landfill sites of the New Delhi to the epidemics in context of covid -19. Increasing urban population brought tons of waste along with it. Covid-19 added some more tons making the condition worst. But somewhere we lagging on the part of gender sensitization of both waste and covid-19 management. We found people of this region are less educated but aware about the waste management and covid-19. But gender inclusive waste management is still lacking the proper attention. We found that women of these landfill sites are somewhere more exposed to the covid-19 due to many biological and social reasons. People living around the landfill's sites are much more vulnerable to the pandemic then rest of the city.

According to Biotic Waste Management, one of the largest common biomedical waste treatment facilities in Delhi, Covid-19 waste generated last July was around 7.2 tons per day, which increased to 12.5-13 tons per day by the end of April 2021. All these wastes get dumped on the landfill sites which include, used mask, used PPE-Kit, Used gloves, sanitizer bottles, oxygen masks etc. Most of it dumped without any further treatment or sterilization. These are every day waste so; it does not get much time to rest and deactivate the virus. Based on this information, we can easily draw a conclusion that people living around these landfill sites, hospitals and garbage dumping sites are much more exposed to the pandemic and at high risk of getting infected.

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