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Contribution of municipal council sweepers and sewer man in India

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Abstract
Sanitary workers keep public spaces, villages, and cities clean to reduce COVID-19 spread. In the COVID-19 pandemic, it's crucial to comprehend their predicament. This research discusses their social, occupational, and housing situations and likely link to COVID-19. In 2017, the author gathered quantitative data in Ladwa, Indri, Thanesar, and Radaur, Haryana. Structured interviews and observations collected quantitative and qualitative data from janitors. The researcher lived with and watched the community during fieldwork. Results demonstrate that their working circumstances are unsafe, working timings and length are likewise risky, alcohol and cigarette usage is high, protective equipment are not accessible, employment status is predominantly contractual, educational standards are low, health conditions are poor, and dwelling conditions are congested. The data imply a significant probability of COVID-19 infection, severe acute illness, and community dissemination.

Keywords: Council, sweepers, sewer man

Introduction
Recently, the President of India, Pratibha Patil, gave an address to a joint session of the parliament. In that address, she announced that her government intends to introduce a bill during the monsoon session of the parliament that will prohibit the manual cleaning of dry latrines, soak pits, and sewers. Patil's speech received a great deal of media attention. Following a spate of court decisions in India instructing local governments to ensure that sanitation employees, particularly sewage workers, are provided with safe working conditions, the President of the United States has made this declaration in response. The announcement has been met with widespread approval from activists and reformers as a much-needed (and long-delayed) measure of' social justice' to ameliorate the appalling living and working conditions of dalit sanitation workers, who are at the very bottom of the complex class and caste hierarchy in India. In turn, activists have called for greater mechanization, modernization, and extension of sanitation infrastructure in order to ensure that the very condition of possibility of the deployment of manual labour in such 'degrading' and 'inhumane' activities is eradicated. This would ensure that the very condition of possibility of the deployment of manual labour in such 'degrading' and 'inhumane' activities is eradicated. Given that any discussion on labour has generally been considered an abomination by the ruling establishment in the post-liberalization era, the recent juridical and political activity on the plight of manual scavengers and sewerage workers has been very refreshing. This is due to the fact that recent activity has focused on the plight of these workers. It is also significant because the government and the courts have at least acknowledged, by addressing the issue of the occupational health of sewerage workers, that sewerage systems do not function on their own and that those who maintain them pay for it with their health and, in many cases, their lives. This is significant because it demonstrates that the government and the courts have acknowledged that sewerage systems do not function on their own. Aside from that, discussions over India's sewage system have primarily taken place in the country's financial, regulatory, and technological-scientific registries up to this point.
Nevertheless, I am not persuaded that simply prohibiting certain vocations or increasing the use of machinery are viable answers to the issue. After all, the problem of previously around for a long time and has its origins in a lengthy history of social and economic inequality.

There is little chance that a legal or technical solution will make the problem disappear. In point of fact, the restriction may cause these tasks to be carried out covertly, which would render the workers more susceptible to danger. In a similar vein, placing an exclusive emphasis on the managerial and technological aspects of infrastructure modernization while ignoring the social, cultural, and epidemiological aspects of the production and maintenance of sewage networks is sure to reproduce the conditions in which a sewage worker's body is considered disposable in the first place. The manner that the sewage treatment system is understood in the first place, in my opinion, is the root of the problem. While the degrading of those who work in the sewage industry and as manual scavengers is a social and political issue, the sewage infrastructure by itself is apolitical and, as such, is a domain of intervention that is reserved for engineers, technocrats, and planners. This viewpoint is shared by the government as well as by a significant number of activists. In other words, once the degrading working conditions and unjust labour practises are removed from the equation, the technical neutrality of the sewerage system will be restored, and it will be able to live up to its promise of being a technology that contributes to the economic modernization and social liberation of the community. Given the obviously significant human and ecological costs connected with infrastructural improvement projects, the concept of the neutrality of infrastructure has been the target of criticism for several decades in India. The way in which these projects perpetuate and exacerbate discriminatory developmental processes, flavouring elites while professing to modernise infrastructure, has been meticulously studied and fought by activists and academics who have worked diligently over the years. However, for some inexplicable reason, the underground world of the sewage system has largely evaded their critical inspection, and it is for this reason that it continues to be tasked with the responsibility of enhancing the general social wellness and public health. To what extent is the assumption, which has not been investigated, that the emancipatory potential of today's sewage system can be justified?

The emergence of the underground sewerage system as a quintessential technical artefact of the modern city is marked from the beginning by multifaceted corporeal, material, and discursive contestations that accompanied the consolidation of the bourgeois social order in Europe point out that modern technologies of urban improvement and public health were conceived of and produced as material-ideological hybrids. A brief survey of the literature on the modernization of European cities reveals that the emergence of the underground sewerage system as a quintes In particular, the sewage system turned into a pivotal location for the conception and consolidation of the technological as a reaction to social, aesthetic, and symbolic fights.

Underground sewage systems were first installed in Indian towns by the British in the late 19th century, reportedly as a measure to improve public health and cleanliness. The overriding objective, on the other hand, was to record in outer space the civilizing work that was done by colonial modernity. Nationalist planners in independent India advocated for the technological modernization of urban space as a vehicle for social modernization. This was a vision that required the breakdown of caste systems that linked lower caste status to socially marginal and stigmatized vocations. Therefore, the underground sewerage system was viewed as a form of infrastructure improvement that would liberate dalits, the formerly untouchable castes that traditionally dealt with the manual handling of human excreta. This would free dalits from the humiliation and dangers associated with manual scavenging. However, right from the start, the negation of the promise of improvement was lodged right at the heart of the modernization project. This was due to the fact that city municipalities simply swelled the newly created labour process of sewage cleaning with dalit workers, thus reproducing the historical relationship between marginalized people and marginalized occupations within the' modern' sewerage system. Consequently, the promise of improvement was never going to be fulfilled. It is not surprising because the technical and spatial layout of the sewerage system was not so much a product of rational design as it was dictated by a complex interplay of the impulse to modernize and the calculative rationality of financial prudence. This is why it is not surprising that this occurred.

Prime Minister Narendra Modi on Sunday carried forward Mahatma Gandhi's legacy of felicitating sanitation workers by washing their feet, in Prayagraj PM Modi offered prayers at the Sangam -- the holy confluence of the sacred Ganga, Yamuna and the mythical Sarawasti rivers -- soon after he launched the government's ambitious income-transfer scheme.

At the Kumbh, the prime minister participated in the Swachh Kumbh Swachh Aabhaar event, organised by Ministry of Drinking Water and Sanitation.

PM Modi distributed the Swachh Kumbh Swachh Aabhaar awards to 'safaai karmacharis' (sanitation employees), 'swachhaagrahis', police personnel and 'naaviks' (boatmen). He also washed the feet (a mark of respect according to Indian tradition) of the swachhaagrahis.

- To promote self-employment ventures for the benefit and/or rehabilitation of Safai Karamcharis /Scavengers and their dependents, either individually or in groups, by way of grants, subsidy, soft loans or advances through the State Channelizing Agency designated by the State Government or Union Territory Administration and subject to the directions given by the Government from time to time.
- To extend loans to students from the community of Safai Karamcharis/Scavengers for pursuing professional or technical education at graduation or higher levels.
- To promote training, quality control, technology up-gradation and common facility centers for carrying out sanitation work.
- To impart the Skill Development Training and entrepreneurial skills of persons belonging to the community of Safai Karamcharis/Scavengers or their dependents for proper and efficient management of production and service units set up by them.
- To assist self-employed individuals or group of individuals from the community of Safai Karamcharis/Scavengers including their dependents or units/co-operatives set-up by them in procurement of raw materials or other inputs and marketing of finished goods or services.
- To work as an apex corporation for co-ordination and monitoring the work of all Corporations, Boards or Agencies set up by State Governments or Union Territory Administration for assisting Safai

Karamcharis/ Scavengers and their dependents for their economic development.
- To help in strengthening the policies and programmes of the Government for socio-economic development of Safai Karamcharis/Scavengers and their dependents

COVID-19

Word has it that COVID-19 is now a pandemic, thus people are being warned to take safety measures to halt the virus's further spread. India is on high alert for COVID-19 because of its status as a developing nation with a large population and a high population density. As a result of this, India initially declared a lockdown, but they subsequently amended it to a curfew. Sanitation employees are one example of those who continue to contribute to the upkeep of the public health system. In order to prevent the COVID-19 virus from spreading further, they are helping to sterilise public areas, neighbourhoods, towns, and cities and ensure that they are kept clean. Sanitation workers are one of the strong foundations that help preserve public health and inhibit the spread of COVID-19 infection because the work they do is highly vital for public health issues and they do it. Is it always the case that when we compare sanitary personnel in India to those in other areas of the world, things are different? Because in India, the most of them, if not all, belong to the same social group (caste), and they have traditionally been responsible for physical labour such as sweeping and scavenging, They are forced to participate in jobs such as sweeping and scavenging since they are deemed untouchables and unable to undertake other responsibilities and tasks. They are excluded from obtaining an education, from participating in economic activities, from residing in certain residential areas, from political engagement, and so on because of their caste position and occupational status. Because of their disability, they face further discrimination from society. In order to get a better understanding of the occupational, social, political, and financial circumstances as well as the health conditions of sanitary employees, this research was carried out. This article will elaborate on their high risk of COVID-19 infection, further developing severe acute sickness from COVID-19, and additional danger of community dissemination based on the facts presented above.

Method

The current essay was created using data gathered for an MPhil thesis in 2017, and it may be seen here. This was a research that was done in a cross-sectional fashion, and it was carried out in four cities in Haryana at the same time: Ladwa, Indri, Thanesar, and Radaur. In order to obtain data from those who took part in the study, the researchers conducted interviews, both formal and unstructured, as well as observations and in-depth interviews. The research strategy for this study was a mixed-method research design because it used both qualitative and quantitative techniques (both to acquire objective and subjective experience of the scavenger/sweeper community) and used both qualitative and quantitative methods (both to analyse the data). In order to carry out the research, the cities of Ladwa, Kurukshetra, Indri, and Radwar in the Indian state of Haryana were chosen. The selection of the towns was accomplished using a process of pure random sampling (chit method). Participants in the research were chosen from the safai karamchari (also known as sanitation employees) employed by the municipalities located in these four towns. Everyone who worked as a Safai Karamchari in each town was asked to take part in the study, and those who agreed to do so were included among the participants. A total of 300 people took part in the investigation during the course of the study. To conduct the research, prior authorization was obtained, and a letter of authorization was distributed to all of the municipal offices. Before beginning the interview, the participants in the study were given information on the study as well as its goals. Everyone who participated in the interview gave either their written or their verbal agreement before it began. They were not given any illusory optimism or promises in exchange for the information they provided.

Results and Discussion

When trying to gain an understanding of the other aspects involved, it is critical to first have an understanding of the background characteristics of sanitary employees. The fact that 74.70% of participants were male suggests that either male employees are more prevalent than female workers or that female workers chose not to participate in the survey. In light of the available literature and the cultural norms of the time, we are able to acknowledge the fact that male employees were employed more frequently as sanitary workers than female workers. A significant majority of the 128 participants, 42.7%, belonged to the age bracket of 49–58 years old; this suggests two things: first, the number of new recruitments was lower; or second, individuals are selecting this profession after having tried many other work possibilities (Table 1). Both of these interpretations are plausible in this scenario due to the fact that, according to the available information, there are currently brand new regular sanitary workers.

Table 1: Demographic Details of Safai Karamchari (Sanitary Worker) of Ladwa, Indri, Thanesar and Radaur of Haryana, India (N = 80).

Background Characteristic	Frequency	Percentage (%)
Gender		
Male	224	74.70
Female	76	25.30
Age		
18 to 28 years	76	8.70
29 to 38 years	64	21.30
39 to 48 years	82	27.30
49 to 58 years	128	42.70
Caste		
Balmiki	300	100
Religion		
Hindu	300	100
Educational status		
Illiterate	186	62
Primary level	40	13.30
Middle level	50	16.70
10^{th} class	20	6.70
12^{th} class & diploma	4	1.30

Source: Data is taken from the survey conducted by corresponding author in Ladwa, Indri, Thanesar and Radaur of Haryana, India.

The appointment has not yet been finalized, but the job is already under progress thanks to outsourcing. Sanitation workers are often temporary contract employees; hence, in order to maximize their benefits, contractors strive to accomplish work with the fewest possible personnel and pay them the bare minimum. Second, there is a social stigma

connected with sweeping and scavenging because people of a certain caste-one that is regarded as untouchable in our culture-are traditionally assigned these jobs. They choose not to participate in this employment since it would make it too easy to recognize them; instead, they look into alternative career options. They return to it when they are unable to find other employment opportunities or when their untouchability status prevents them from being accepted in other fields of endeavour. All of the contestants are members of the Hindu faith and belong to the Balmiki caste. Again, there are two hypotheses that may be considered: either all of the people who work in sanitation belong to the same caste, or the people who work in sanitation who belong to different caste groups avoided taking part in the study. Because in the past sweeping and scavenging were activities linked with particular caste groups (known as Balmiki or Chuhara in Haryana), the same caste structure may be continued now. This allows for both alternatives to be allowed. Because of the stigma that is associated with this line of employment, the janitorial worker does not come forward. The majority of participants, or 62%, were illiterate, and the remaining participants likewise did not have a high level of education. The presence of such a group of participants suggests that individuals with lower levels of education select this line of employment or that the community of people who choose this line of work are prevented from receiving an education. Both are quite likely to occur given that a person with a high level of education will not pick this line of employment because of the stigma that is associated with it and the poor salaries that are offered. The community that is linked with sweeping and scavenging is not allowed to participate in the school system because of their untouchable position and the perception held by the society that they do not require an education because they are required to perform menial labour. Only a few occupational variables were chosen to be included from the pool of data since they were relevant to the purpose of this paper. The fact that they are now employed, the fact that they wear protective gear, and the reason that they chose this line of work are the primary highlights of their professional feature. The findings indicate that 59.3 percent of those who participated were permanent regular workers, while the rest were contractual workers (Table 2). According to them, the increased number of contingent workers is due to the lack of newly created permanent positions recruiting, but their involvement in this study was far lower than expected. The reason for this is that they were not permitted to take time off from their jobs in order to take part in the research. According to the findings of the study, 98.7% of participants claimed that they do not get any protective gear while working, and the same was seen throughout the data gathering process. Some of them said that an authority figure asked for their signature or a thumb impression when they received gloves and shoes, but that the authority figure did not offer the same.

Table 2: Occupational Characteristic of Safai Karamchari (Sanitary Worker) of Ladwa, Indri, Thanesar and Radaur of Haryana, India (N = 80).

Background Characteristic	Frequency	Percentage (%)
Working status		
Permanent	178	59.30
Contract basis	122	40.70
Work type		
Sweeping and sewage cleaning	222	74
Driving dumping vehicle	48	16
Garbage loading	14	4.70
Working in dumping ground	4	1.30
Safai Daroga	12	4
Protective gears at work		
Yes	4	1.30
No	296	98.70
Reason of choosing work		
Got from ancestors	118	39.30
Lack of opportunity	126	41
Personal wish	48	16
Forced to do	8	2.70

Source: Data is taken from the survey conducted by corresponding author in Ladwa, Indri, Thanesar and Radaur of Haryana, India.

Health-related factors

According to the findings, 58.7% of the participants were drinking alcohol on a daily basis, and all of the drinkers were men. They also have an explanation for why they drink alcohol: according to them, it is very difficult to operate in an environment with a lot of filth, fumes, and unpleasant smells without drinking alcohol, thus they do drink alcohol. Some of the participants reported that the smell of their beds and images of dirt continued to come to their minds long after they had left work; thus, they found it difficult to eat, which is why they drank to be able to eat and sleep. 62% of participants reported using tobacco, the majority of which was smoking bidis. The prevalence of tobacco use is higher among sanitary employees. It should not come as a surprise if they are using bidi given how widespread its use is in Haryana. Because they are not permitted to take breaks even when they are working, this bidi is helpful to them. During their work time, they are allowed to enjoy some light conversation and a little respite while smoking bidis. 39.3% of participants reported a history of chronic sickness and injury, and 61.3% of respondents claimed that they are now living with health difficulties. This was shown by the results (Table 3). The numbers are shocking, but it was expected predicted due to the fact that they work without protective clothing and are unaware of the dangers posed by the materials they handle, including a variety of hazardous chemicals, poisonous fumes, untreated animal and human faeces, and other potentially hazardous materials. Working

Conditions: They are responsible for cleaning things like roads and sewer lines, as well as cleaning toilets, collecting garbage door to door, loading and unloading rubbish, and working in dumping yards, among other things (Singh, 2009) [19]. On a daily basis, they are exposed to waste food items, tissue papers, worn masks (given the circumstances), baby diapers, dog faeces, cow dung, dead animals, sewage fume and toxic fumes, dust, and a variety of other waste materials (Kumar, 2017) [19]. When they are sweeping, collecting dust, loading and unloading, they come into close contact with waste products, which put them at risk of contracting a wide variety of harmful viruses and infections. Their morning shift runs from 6:00 am to 1:00 pm, and their evening shift runs from 3:00 pm to 6:00 pm. The working hours for both shifts are as follows: The timing of their duties is very significant for comprehending the influence that COVID-19 has on them (Kumar, 2017) [19]. Their shift begins at 6:00 in the morning, and they have to leave their homes at least by 5:30 in order to make it to work on time. Because of this, the majority of sanitary workers arrive at work without having eaten anything, as Kumar also saw (2017) [19]. People in India often have their breakfast between the hours of 7:30 and 8:30 in the morning. This results in a risk in two different ways: first, the individuals come to the workplace without having eaten, which lowers their immunity power; second, the individuals feel hungry while they are working, so they drink tea and eat snacks, which provides an opportunity for COVID-19 to enter their bodies. The Conditions of Living: Throughout history, they were not permitted to live in the primary settlement, thus they were forced to make their homes on the outskirts of villages, towns, and cities (Jammanna & Sudhakar, 2015) [20]. In the present day, people reside in maholas, which are similar to slums and government rehabilitation villages. These settlements are often located on the outskirts of town, but as a result of ongoing building, they have moved inside cities. The majority of their homes range from one to two rooms, and they are all located extremely near to one another (Shahid, 2015) [18]. In a number of locations, they use restrooms and drinking fountains that are shared by the community as a whole (Vivek, 2000) [6]. They live in crowded communities that are connected by narrow roadways that run between one other and other locations. Belief System: The scavenger and sweeper group, also known as the Balmiki caste, prays to a number of godling divines, according to the observations and the literature that is now accessible. Each household that belongs to the sweeper group worships at least one of the five unique caste godlings, in addition to a number of illness goddesses, village tutelary deities, and malicious ghosts that are also revered across the community. The purpose of the sacrifices is to appease the cravings of the god, and by doing so, to forestall the vengeful visitation of sickness and disease onto the people of the home that is participating in the worship. In the past, it was common practise for each family to harbour the hope that at least one male member of the home, if he performed great acts of dedication and devotion, may one day become a strong shaman. (Mahar, 1960, p. 282) [11] Even if someone has a fever or any little bodily discomfort, dizziness, weariness, etc., for that family Bhagat will go through the possessions and explain the origin of the problem as well as the cure to it. It is a widely held belief that the godlings will give a remedy to the problem by speaking through the family Bhagat.

Table 3: Risk Health Behaviour and Health Problems in Safai Karamchari (Sanitary worker) of Ladwa, Indri, Thanesar and Radaur of Haryana, India (N = 80).

Characteristic	Numbers	Percentage (%)
Alcohol use		
Yes	176	58.70
No	124	41.30
Tobacco		
Yes	186	62
No	114	38
History of chronic illness		
Yes	118	39.30
No	182	60.70
Current illness		
Yes	184	6130
No	1 16	38.70
Type of illness		
TB	8	2.70
Skin problems	2	0.70
Eye problems	2	0.70
Respiratory problems	4	1.30
Joint pain	2	0.70
multiple problems	152	50.70
Accident on duty	2	0.70
BP	26	8.70

Source: Data is taken from the survey conducted by corresponding author in Ladwa, Indri, Thanesar and Radaur of Haryana, India.

COVID-19 and Sanitary Workers

It is possible to identify three distinct degrees of connection between COVID-19 and the working circumstances of sanitary personnel. These three levels can be the relationship between COVID-19 infection and their conditions; the development of acute chronic sickness owing to COVID-19 and their conditions; and the third level is the relationship between the spread of COVID-19 and their problems. Infection and Those Who Work in the Sanitary Industry: As was just discussed, the fact that they operate in an environment where they come into touch with a variety of various surfaces and waste materials poses a significant health hazard. Because COVID-19 may remain on a variety of surfaces for a few minutes to several hours (Sohrabi *et al*., 2020) [16], the virus can infect sanitary workers when they come into touch with such surfaces and then go on to spread throughout their bodies. When they deal with waste products, such as used tissues and masks, they come into touch with the virus, and because of this, it is possible for the virus to enter their body. Waste materials also have a high probability of harbouring the virus. It is possible for the infection to enter the person's body and spread through their nose, eyes, or mouth after having been spread from hand to hand. They have a lunch break of two hours, and then they go back to work for three hours. During the two-hour lunch break, workers who live nearby go to their homes for lunch, while the remaining workers have lunch at the office and rest in the shade of trees there.

Whoever goes home has the option of taking a bath before eating, but they are not required to do so. The chance of contamination was decreased by having a bath; nevertheless, the risk of infection was increased for both the individual and their family members when the person did not take a bath. Those who do not return home will eat their lunch in the same clothing they wore when they got up in the morning and will not bathe, which will put them at a greater risk of contracting COVID-19. They are increasing their

danger by touching their nose and eyes several times while they are resting in the same garments, which also puts them at greater risk. It is well knowledge that the only method to inhibit the spread of COVID-19 in a big society is through protection (Sohrabi *et al*., 2020) [16]. Over ninety-eight percent of respondents have said that they do not receive any form of safety gear. In the current scenario, I was able to observe that they were wearing masks; yet, after questioning them, I learned some fascinating information about the issue. They told me that the only safety precautions they had been provided with were masks, and that each mask was intended for a single use; yet, after lunch break, they were required to continue using the same mask. Because of this, the possibility of contracting COVID-19 may rise. They did not have access to soap or hand sanitizer, therefore in order to clean their hands before consuming tea, snacks, or lunch, they used plain water, which is not effective in removing viruses from the hands. The vast majority of sanitation employees are smokers, and many report having regular cravings for cigarettes. While they are smoking, their hands are constantly touching their lips. It is possible for viruses to quickly enter a person's body if their hands come into touch with COVID-19. It's likely that someone may advise them to stop smoking, but in reality, it won't be possible, and it might even be riskier to do so.

Even if smoking is prohibited in their environment, they will continue to experience the urge to smoke and may smoke in secret, which may undermine their ability to wash their hands and isolate themselves from other people. The findings showed that 62% of those working in sanitation were illiterate, while just 8% had completed high school or more. Because of the hostility directed at them, social exclusion, discrimination, and social stigma, they have a high rate of high school dropouts (Singh, 2014). This suggests that their level of awareness is poor, and the fact that they have a low level of education makes it harder to disseminate information to them.

Because of their lack of awareness, they might not take the necessary measures, which might result in COVID-19 infection. Acute Chronic Disease Caused by COVID-19 and Sanitary Worker: They have a number of risk factors that put them at a high risk of acquiring acute chronic illness caused by COVID-19 infection, as well as an increased chance of mortality. According to the research that has been done, human immunity plays a very significant part in preventing acute and chronic illnesses caused by COVID-19 infection (Li *et al*., 2020) [2]. A compromised immune system can result in recurrent respiratory disease and an increased risk of death.

Because their work schedules suggest that they do not have their breakfast or that they take it very infrequently, they go for more than 18 hours without eating anything other than tea, beginning with dinner and ending with lunch. That unquestionably has a detrimental impact on their body immunity and raises the likelihood that they may have an acute sickness as a result of a viral infection. Because of this, it is clear that if they become infected with COVID-19, they will very certainly go on to acquire an acute chronic infection. Their habit of consistent and dependent alcohol consumption puts additional stress on their liver (Mandayam *et al*., 2004) [21], which in turn affects their ability to digest food properly. Their body's immune becomes weakened as a result of the lack of digestion, which leaves them susceptible to acquiring severe acute sickness as a result of COVID-19.

The vast majority of employees who smoke also consume alcohol, which places them in the category of high-risk individuals. Because smoking at work raises the likelihood of having an infection from COVID-19, and drinking lowers their immunity, which may lead to severe acute illness and even death in certain cases, this combination can be fatal. Lockdown is another element to consider. Because the supply of alcohol has been cut off because of the lockout, sanitary employees who are dependent on alcohol are now experiencing acute withdrawal symptoms. As a result of the withdrawal symptoms, they experience symptoms such as bewilderment, hand tremors, irritability, cravings, and so on. These symptoms force them to have poor hygiene and cause them to smoke excessive amounts of tobacco while they are on duty.

According to the available research sanitary personnel are more likely to contract a number of illnesses and diseases as a result of their working environment, their use of alcohol, and their consumption of tobacco in any form (including smoking and chewing) (Rangamani *et al*., 2015) [13]. Over 61% of the people who took part in the activity (scavengers and sweepers) reported having one or more physical illnesses. They are therefore not just a group that is at a high risk, but they also have a high possibility of acquiring a severe acute disease owing to the physical sickness that they currently have. Not only do they have issues with their physical health, but a substantial number of them also have issues with their mental health as a result of long-term social marginalization and social shame.

According to research conducted by Kumar (2017) [19], more than forty percent of those who scavenge or sweep experience acute anxiety and sadness. That can lead to poor hygiene and poor nutrition, both of which can contribute to all three conditions: being infected, spreading infection, and developing a severe acute sickness from a COVID-19 infection. Transmission of COVID-19 at the Community Level and Among Sanitary Workers: The community-level spread of COVID-19 is currently India's greatest source of contemporary concern. Therefore, it is essential to have an understanding of the elements that may be responsible for the COVID-19 outbreak in the community. In this scenario, sanitary personnel are particularly vital since they continue to perform their jobs around the clock despite the fact that the country is under full lockdown.

As a matter of fact, sanitary workers are members of a population that has an increased likelihood of contracting an infection and developing an acute or chronic sickness as a result of an infection. Under these circumstances, it is essential to have an understanding of the elements connected with sanitary personnel that may contribute to the infection spreading across the community. Their living conditions demonstrate how difficult it is to maintain social distance because they stay and sleep in the same room, putting them in close proximity to one another. Additionally, because they fill their water bottles and use the restroom in a shared space, they are forced to interact with one another. Therefore, on the one hand, they are at a high risk for contamination, and on the other hand, they are at an extremely high risk of transferring the disease to one another, making both of these groups high-risk. The fact that their homes sit near to one another and open onto a congested street raises the possibility of disease spreading across the neighborhood (The World Bank, 2019). Since the majority of workers in the sanitation industry smoke bidis,

they frequently or maybe consistently suffer from cough and throat infections. Because of this, even if they become infected with the virus, it will be impossible to distinguish between the symptoms. Since of this, there is a significant risk of COVID-19 spreading within families and among coworkers because individuals are unable to determine whether the symptoms are the result of smoking or COVID-19. According to the research that has been conducted, this population is the one with the lowest level of education hich lowers their level of knowledge of COVID-19. Due to a lack of education, it is difficult to obtain fresh information on viruses and other aspects associated to them. As a result of this, people do not follow all of the advice that is advised, which makes the danger of infection and its spread greater. The belief system of the community might also be quite harmful for the community in terms of the propagation of COVID-19. According to their way of thinking, even a mild case of fever is brought on by an up priassar, which is a spirit's impact, and they go to their godlings for a cure. Therefore, given that they do not believe it to be a medical sickness that is brought on by a virus, it is unlikely that they will seek medical attention for it. As a result of this, additional members of the family as well as people of the community will become affected.

Door to door collection

There are a total of 85 wards and 19 zones in the city of Indore. On average, each ward contains 6,000 residential units, in addition to 600 places of commercial business (part of 88 notified commercial areas). Waste is produced in Indore from a wide variety of sources, including residential neighborhoods, business districts, and other institutions such as RWAs, hospitals, and hotels, amongst others. The door-to-door collection system serves homes and residential complexes, whereas the bulk collection system serves semi-bulk and bulk generators. The door-to-door collection system serves households and residential complexes. Through its comprehensive door-to-door collecting system, Indore guarantees complete coverage of all wards.

Before 2016, the method for collecting rubbish from homes was not nearly as efficient as it is now. The management of solid waste was completed in three stages, each of which is discussed more below. 1) Primary collection: In certain areas, garbage from households was collected by personnel employed by the municipality, while in others, it was collected through private arrangements made by housing colonies. The term "Jagirdar" was used to refer to private garbage collectors. They provided a very low level of quality service and frequently deposited rubbish in open government property or vacant plots, which created health problems for the local population.

In most cases, the garbage that was gathered was thrown away in the trash cans that were placed along the major thoroughfares. The city possessed a total of 1380 trash cans, some of which were in extremely bad condition. The garbage cans would frequently get overflowing, giving the city an unsightly appearance. This rubbish would be consumed as food by stray animals such as cows, pigs, and dogs. The Jagirdars were responsible for the care of some of these animals, such as cows and pigs, and they were able to supplement their income by either selling the animals' meat or milk from the cows. They had a strong interest in not keeping the areas clean so that the animals could feed on the filth, which would minimize the amount of money they needed to spend on the animals' care.

2) Secondary collection: A commercial contractor named A2Z Infrastructure Limited was responsible for taking the garbage out of the central trash cans and transporting it to an open dumping place in Devguradia. A2Z was going through a serious financial crisis, which led to the secondary trash transportation system being badly impacted. Their financial difficulties were reflected in the poor maintenance of vehicles that they controlled, as well as in sporadic service that led to the piling of trash and the overflowing of trash cans.

The unsanitary appearance of the city was largely attributable to the ineffective collection and transportation of residential trash. In addition, individuals frequently defecated in the open in slum neighbourhoods since the municipality did not provide sufficient public restrooms for the people who lived there to use. Even in the city itself, the hygiene of the public facilities was subpar, which led to other people living there defecating in the open as well.

The Mayor voiced her concerns about the cleanliness of the city to the Commissioner, as well as her apprehensions about continuing to work with A2Z. As a result, the contract was terminated in August of 2015, just a few months after Mr. Manish Singh was appointed to his position as Municipal Commissioner of Indore.

Implementation of the Direct-to-Device (D2D) Collection System An identification study needed to be conducted in order to successfully implement a door-to-door collection system. This study assisted in determining the amount of garbage generated at each ward as well as the population of each ward. On the basis of this information, a comprehensive route plan to visit all wards was developed. In order to satisfy the demand for garbage collection from each ward, a comprehensive strategy for the deployment of vehicles and people was developed and put into action based on the route plan.

Utilizing partitioned trucks allows for the completion of the door-to-door collecting service. Each dumpster is equipped with three distinct pickup bins: one each for wet garbage, dry waste, and household hazardous waste. These tippers are responsible for transporting garbage from residences to the transfer station. Once at the transfer station, the rubbish is loaded onto hook loaders and driven to the trenching area. A tracking system that is outfitted with GPS is employed to keep tabs on each and every vehicle that participates in the system of collecting and transportation. The monitoring cell maintains a vigilant watch over the GPS system at all times. Every time a driver takes a detour from their assigned path, they will be fined, and if they do it several times, they will be fired.

The Door to Door Collection System is responsible for collecting the liquid waste that is produced by residential generators. In order to collect waste from business sectors and residential areas in Indore, the IMC has implemented a system that collects garbage at the door of each building it services. The garbage is gathered by use of partitioned trucks referred to as "Tippers," and it is then sent to garbage transfer stations in order to undergo secondary collection.

The Bulk Collection System is responsible for collecting the moist waste that is produced by semi bulk generators that generate between 25 and 100 kilogramme of garbage. The vehicles that are used for collecting rubbish in large quantities include a compactor that is used for collecting dry

waste and a dumper that is used to collect wet waste. A predetermined deployment strategy calls for these vehicles to move in tandem at all times. After finishing their collecting route, these vehicles transfer the garbage directly to the central processing plant.

Garbage generators that produce more than 50 kg of waste each week are considered to be bulk generators. Bulk garbage generators are included in this category. It is required for these generators to treat their wet waste on-site in accordance with the rules provided by the GoI. Because of this, these generators do not have their wet waste collected.

The tippers then deliver the wet garbage that was collected by the door-to-door pickup vans to one of the eight transfer stations. When the wet garbage arrives at the GTS, the tippers discharge it into specialized compactors, which then compress it and load it into dedicated hook loaders. At the GTS, the log books record information on each and every trash collection truck that arrives at the facility. After completing their assigned collection routes, the bulk collection vehicles go directly to the processing facility rather than stopping at the GTS.

At the central processing plant, the structure known as the Weighment Bridge is put into operation. All of the cars that are arriving into the factory will initially come into contact with personnel at this location. Before moving on to the processing plant, all of the wet waste that has been collected through the door-to-door collection and the bulk collection system is transported to this computerized facility to have its weight determined. This is done before the garbage is sent to the processing plant.

The Central Processing Plant and the Decentralized Waste Processing Units are the two locations that perform the processing of the wet waste. Because the bulk producers that produce garbage in quantities of 50 kg or more handle all of their wet waste at their own facilities, this type of waste is not dealt with at the central processing plant. Compost is made from the wet waste that is brought to the central wet waste processing facility from the GTS (D2D Collection) and the semi bulk collection (25 to 100 kg) bins. This garbage is brought there by being carried.

Dry Waste: Dry Trash is described as "garbage other than bio-degradable waste and inert street sweepings and comprises recyclable and non-recyclable waste, combustible waste, as well as sanitary napkin and diapers, etc." Dry Waste also contains recyclable and non-recyclable waste, as well as combustible waste."

Materials such as sanitary pads, lead acid batteries, and other similar items are included in the category of domestic hazardous waste. This garbage is gathered in a separate container that is connected to the rear of the truck that collects rubbish.

This waste generated as part of the dry waste is explained below.

The door to door and bulk collection methods are used, just like they are for the collection of the wet garbage, to collect the dry waste. The collection of dry waste created by home generators is done with the use of tippers, whereas the collection of dry waste generated by bulk producers is done with the use of the bulk collection system. A distinct Third Bin, which is mounted to the rear of the door-to-door collection tipper, is used to collect the home hazardous trash.

The GTS is put to use in the process of secondary garbage collecting. After being put into specific compactors, the dry waste is emptied and then compressed before being loaded onto dedicated hook loaders and delivered to the central processing facility.

The DHW is placed in drums, which are subsequently sealed before being subjected to immediate weighing. The employees of an outside organisation that manages the Central Biological Waste Treatment Facility are the ones responsible for carrying this out. Upon completion of the weighing process, the staff of the agency hands over slips to the staff of the GTS on which the collection time, date, and weight of the garbage collected are noted. After that, the garbage is transported in specially designated vehicles to the facility.

After that, the garbage is brought to the facility where the weighbridge is located. This facility, which can be found at the central waste processing plant, serves as the initial point of contact for all vehicles that arrive at the plant. Along with other information such as the in-and-out time of each vehicle, its registration number, source transfer station, and so on, the computerized facility keeps a record of the weight of all of the dry waste that is being collected via the door-to-door collection and the bulk collection system.

Deveguradiya in Indore is home to the city's principal dry waste processing facility. The dry trash is separated into its component parts at these plants, which may include metal, rubber, board, plastic, and other materials. The 343 rag pickers who are employed at the plant's two Material Recovery Facilities are the ones who are responsible for performing this sorting.

The General Transfer Station sends the Household Hazardous Waste directly to the Central Domestic Hazardous Waste Treatment Facility to be burned for disposal. This facility is operated by an outside organisation that has been hired to do so. The facility is put to use for the treatment of hazardous waste from both home and medical sources. This facility is responsible for the burning of the waste.

During the processing of dry waste, inert is retrieved from both of the MRFs. After that, the inert is sent to the sanitary landfill that is located inside the same facility. Prior to the transfer, the item is given a weight on the weighbridge, and this information is then entered into the system.

The ashes that are produced when incinerating domestic hazardous trash are added to the waste that is delivered to landfills after the rubbish has been burned. The phrase "hazardous landfill" refers to the particular landfill facility that is set aside specifically for the disposal of hazardous material.

From IEC to Behavioral change – the secret of Indore's transformation

IEC stands for information, education, and communication. Changing people's behaviour is essential to the success of the Swachh Bharat Mission.

IMC adopted and undertook a range of IEC activities ranging from traditional to audiovisual to print and electronic media to social and digital media in order to change the behaviour of different segments of the population and those who are associated with different sectors, such as hotels and restaurants, hospitals, industry, transportation, commercial complexes, parks and entertainment venues, etc. The following is a brief

explanation of some of the unique IEC approaches that have been taken up by IMC for the purpose of bringing about behavioral change in Indore.

The substance of grassroots inventions like as street plays, wall murals, and FM radio was continuously refreshed by adding new thematic themes to be transmitted and adopting unique techniques of accomplishing the same. Events of cultural significance, such as the Ganesh festival, Dusshera, and Gandhi Jayanti, served as platforms for the propagation of the swachhata message. Integration of IEC into monitoring efforts was a crucial component to consider in relation to this component. The present status of service delivery was validated (monitored) through the use of these actions.

The verification procedure was carried out using a variety of various methods. These included a) an app called 311 for the delivery of services; b) unexpected checks conducted through online site visits; and c) monitoring employee attendance through biometrics. The 311 app has become an essential tool of reporting concerns coming from a variety of residential regions around the city. Quick action is taken in response to the complaints that have been lodged. The Municipal Commissioner is in charge of keeping track of how complaints that have been filed and dealt with are progressing.

The objective of the IEC was to educate residents about who they should contact in order to obtain services and communicate their concerns. The nature of the relationship between service providers (community groups, citizen volunteers, and non-governmental organisations) and the machinery of the IMC was crucial to the success of the Swachh Indore initiative (CSI, Zonal officers and core IMC officials). Certain IEC media, like as nukkad nataks, rallies, and swachhata samitis, helped link citizens with service providers. On the other side, technology such as the 311 App and walkie-talkies aided in directly communicating with the IMC official machinery.

As a result, the IEC was developed in such a way that it would enhance the capacity of citizens to communicate with service providers as well as the official IMC machinery. For instance, one facet of managing solid waste was recycling the garbage to make compost, which was another use for the compost. In order to facilitate the manufacture of compost, linkages were established with the Department of Chemicals and Fertilizers. For the purpose of guaranteeing that the farmers in the surrounding areas have a steady supply of compost, linkages with the Department of Agriculture have been developed.

Biomethanation plant for wholesale vegetable and fruit market

It is well acknowledged that Choitram Mandi is the largest mandi in the region of Central India. On a daily basis, there is a waste production of around 20–25 MTPD worth of fruit and vegetables. Previously, the garbage was collected and then brought to the IMC's centralised waste processing and disposal location, which resulted in significant expenditures in terms of both labour and transportation costs. As a result, IMC developed a bio-methanation plant (also known as a bio-CNG plant) with a capacity of 20 MTPD in accordance with its objective of encouraging the decentralised treatment of organic waste. IMC went through a process of soliciting bids before selecting Mahindra & Mahindra Ltd. of Mumbai to build the factory, which was finally put into operation in December of 2017. The total cost of the project is 15,000,000,000 rupees, of which 7.2,000,000 rupees are allocated to development. IMC was the one who offered VGF. The length of the project's concession duration is fifteen years. At the moment, all of the garbage consisting of fruit and vegetables that is produced at Choithram Mandi is being brought to the Bio CNG facility in order to be processed there. On a daily basis, an average of around 800 kg of purified and compressed Bio CNG that contains 95% pure Methane gas is produced. About 15 of the city's buses get their energy from compressed bio-natural gas (CNG), which is utilized as a fuel. The digested slurry is put through a solid liquid separation unit, the liquid that is filtered is reused in the production of slurry, and the solids that are left over are dried out and made into organic compost.

Conclusion

Since COVID-19 is capable of surviving on any surface, sanitary workers are likely to come into touch with a wide variety of waste and surfaces while they do their jobs. They are able to transport viruses and become infected from that location. Their various occupational, educational, social, and health factors, together with their living standard and conditions, render them susceptible to developing severe acute sickness, which may result in high mortality and community spread. Sanitation employees are an essential component in the upkeep of public health; but, what will happen if they begin to pose a threat not just to their own health but also to that of the general population? The evidence provided in this article demonstrates that the workers in the sanitation industry are playing a very significant part in the fight against the COVID-19 outbreak. However, in addition to that, this study also included an analysis of the elements linked with sanitary personnel that can bring this pandemic to the level of the community. They have a significant chance of becoming infected with COVID-19, which might lead to the development of severe acute disease. In addition, the conditions in which they live pose a significant threat of the disease being passed on to others. As a result, it is of the utmost significance to put some effort into the aspect discussed in this article.

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