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Public Policy Center

Ramaiah Webinar on
Urban Solid Waste Management to Reduce COVID-19 Infection Spread

Currently, Urban Solid Waste Management (USWM) is facing a new challenge with the global spread of coronavirus (COVID- 19) pandemic. A recently published letter[1] has highlighted the problem of waste quarantine to reduce COVID-19 infection spread. Among the many impacts of this pandemic, the USWM practices are expected to gain more attention. A major new problem is how to handle the highly infectious waste generated during diagnosis, treatment, and quarantine of those infected. It combines the challenges of solid waste management and biomedical waste management[2]. Although the Central Pollution Control Board has issued specific guidelines for the states of India to store, collect, transport, recycle, process, and dispose COVID-19 infectious waste to reduce the risk of infection spread. The waste generated by COVID-19 suspected or infected patients can be dangerous if mixed with daily waste management system. With an increasing number of infected quarantined patients, the quantity of infectious waste is also increasing. Consequently, the risk for collection workers and informal waste sector workers who handle it has also increased. The collection and disposal of masks, sanitiser bottles, gloves, and shoe/head cover used by the public to avoid COVID-19 infection is another risk. It increases the quantity of waste reaching the dustbins.

An USWM system is complex. It can be visualized in structured natural-English using an ontology (Figure 1)[3]. The desired outcomes of USWM are listed in the rightmost column of the ontology – the health, aesthetic, environmental, social, and economic wellbeing of the community. The process of USWM is defined by the middle four columns. They are: (a) the functions of waste management, (b) the types of solid waste, (c) the sources of solid waste, and (d) the stakeholders in solid waste management. The outcome and process of USWM system are guided and regulated by the seven types of policy instruments listed in the first column. The policy instruments together with process components, and outcomes encapsulate the 55,440 (7*8*3*6*11*5) pathways for USWM. Three illustrative pathways critical in the context of COVID-19 pandemic are:

- Implementation of regulatory guideline for disposal of solid non-biodegradable residential waste by service providers to reduce COVID-19 infection spread.
- Implementation of legislative instruments for segregation of solid non-biodegradable residential and non-residential waste by waste generator to reduce the risk of COVID-19 infection spread.

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[1] Kashyap, S., Ramaprasad, A., & Nanda Kumar, B. (2020). Waste Quarantine to Reduce COVID-19 Infection Spread. *International Journal of Health Planning and Management*, 1–2. https://doi.org/10.1002/hpm.3026

[2] Kashyap, S., Gadicherla, S., Ramaprasad, A., Sastry, N. K. B., & Thapsey, H. (2019). *An Ontological Analysis of Challenges Involved in Biomedical Waste Management*. Paper presented at the International Conference on Healthcare Waste Management, Antimicrobial Resistance & Climate Change (ISHWMCON 2019), Jaipur, Rajasthan, India

[3] Kashyap, S., Ramaprasad, A., & Singai, C. (2019). *An Ontological Analysis of Challenges Involved in Urban Solid Waste Management*. Paper presented at the 2nd International Conference on Environmental Geotechnology, Recycled Waste Materials and Sustainable Engineering (EGRWSE- 2019), University of Illinois at Chicago, USA.

- Implementation of regulatory instruments for separate collection of solid non-biodegradable residential waste by resident welfare association to reduce the COVID-19 infection spread in apartment.

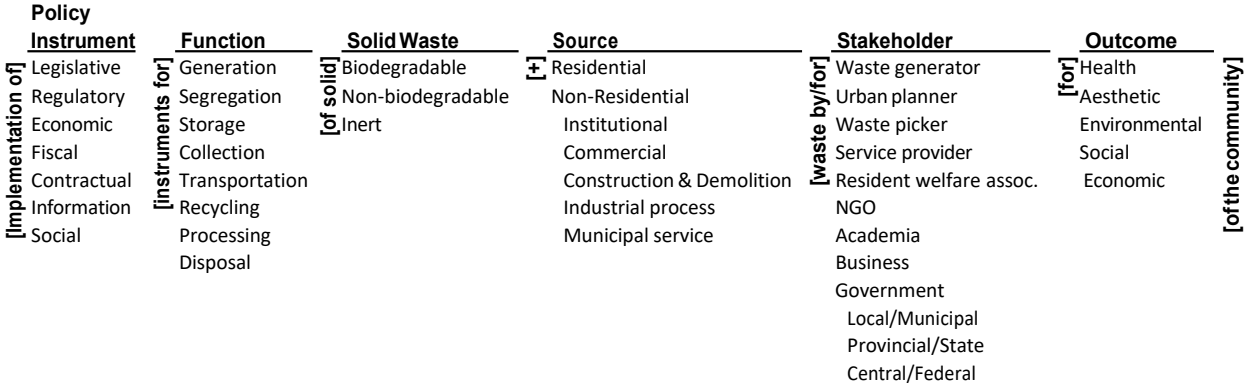

Figure 1: An Ontology of Urban Solid Waste Management (Kashyap et al., 2019)

The ontology can be used to systematically: (a) design the solution alternatives for USWM during COVID-19, (b) determine effective, ineffective, and innovative alternatives, and (c) direct the choice through feedback and learning. Based on the webinar propose a roadmap for research, policy, and practice to address the challenges of USWM during the COVID-19.

The discussion will be free-flowing, structured brainstorming for about two hours. It will address the need for, priorities in, and pathways for an effective and efficient USWM during the crisis. The discussion will be mapped onto the ontology to highlight the effective, less effective, and ineffective pathways. The map will help to determine the pathways to be reinforced, redirected, and rediscovered in the future.

This would help in formulating strategies to break the infection chain with a clear strategy. The webinar discussion will focus on the following issues:

- Regulatory guidelines for management of the highly infectious solid waste generated during diagnosis, treatment, and quarantine of infected patients
- Implementation of separate collection of the highly infectious waste without mixing with daily municipal solid waste collection
- Policy instrument to reduce the risks for service provider and informal waste picker
- Generation of solid waste from different sources are increasing

Date: September 11th, 2020 (Friday)
Time: 3 pm to 5 pm (IST)
Facilitator: Dr Arkalgud Ramaprasad, Director, Ramaiah Public Policy Center; Professor Emeritus, University of Illinois at Chicago, USA
Moderator: Dr Nandakumar Bidare Sastry, Department of Community Medicine, Ramaiah Medical College, Bengaluru, India.

Coordinators

Dr Shwetmala Kashyap, Senior Research Fellow, Ramaiah Public Policy Center, Bengaluru, India
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LETTER TO THE EDITOR

WILEY

Waste quarantine to reduce COVID-19 infection spread

Dear Editor,

Coronavirus disease (COVID-19) is contagious and caused by the novel coronavirus.[1] It has been declared a global pandemic. Coronavirus spreads primarily through droplets of saliva or discharge from the nose and mouth when an infected person coughs or sneezes. These droplets contaminate the objects and surfaces around that person and infect others who touch their eyes, nose, or mouth after touching the infected objects or surfaces. Hygiene compliance and isolation are necessary to break the infection chain.

A major challenge of containing COVID-19 is to handle the highly infectious waste generated during diagnosis, treatment, and quarantine of those infected patients. Their waste must be stored, collected, transported, recycled, processed, and disposed separately. All those handling COVID-19 infected waste or meet them are potentially at risk of being infected.

For example, Bengaluru city has 198 wards and generates around 3000 to 3500 tons/day of municipal solid waste (MSW) from domestic sources and 40 tons/day of bio-medical waste or BMW.[2,3] The latest data show that the city has 32 hotspot wards. In each, (a) at least one COVID-19 patient has been reported in the previous 28 days, or (b) at least 50 people are in quarantine. These hot spots generate 493 tons/day of MSW all of which would be infected by BMW from COVID-19 if it is not treated separately.

BMW and MSW are sources of COVID-19 infected solid waste. The WHO and country-specific guidelines for safe management of BMW generated during diagnosis, treatment, and quarantine of COVID-19 patients must be applied to address the challenge systematically.[4-6] In addition to its BMW Management Rules, 2016, India has recently developed central guidelines to ensure that waste generated from isolation wards, quarantine camps/homes of suspected patients, testing centers and laboratories, Urban Local Bodies, common biomedical waste treatment and disposal facilities during testing of people and treatment of COVID-19 patients is disposed in a scientific manner.[6-8] Furthermore, liquid waste management in healthcare facilities and isolation wards must be undertaken as per the prevailing norms to prevent infection of sewers and water bodies.

Coronavirus remains viable for varying periods in aerosols, and on plastic, stainless steel, copper, and cardboard—on plastic and stainless steel surfaces up to 72 hours.[9] The plastic waste generated by COVID-19 suspected/infected patients can be dangerous if mixed with daily MSW collection. It increases the risk for collection workers and informal waste sector workers who handle it; they should be provided with personal protective equipment such as gloves, face masks, waterproof aprons, and eye goggles. The collection and disposal of masks used by the public to avoid COVID-19 infection are another risk. The use of reusable mask that can be washed and reused should be encouraged to reduce the quantity of waste reaching the dustbins. Furthermore, there is a need for immediate capacity building and specific guidelines to manage MSW generated from COVID-19 patients.

Double-layered bags should be used for collecting and segregating MSW and BMW generated from COVID-19 patients to ensure adequate strength and no-leaks.[6] The collected waste should be stored separately. Dry MSW should be quarantined within the premises for a longer duration (>72 hours) to eliminate the virus before it reaches the recycling process.[9] MSW dry waste may also be sent for incineration with BMW at the common biomedical waste treatment and disposal facilities or the hazardous waste management incinerators. However, this may be

difficult because waste quantities are increasing with COVID-19, and the incineration facilities' capacity is limited. It is important to break the infection chain closest to the source with a clear strategy.

ACKNOWLEDGMENT

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List of Panellists

Sl.No	Name	Affiliation
1.	Mr. Ashish jain	Founder Director of Indian Pollution Control Association, (NGO). New Delhi
2.	Dr. Ashok Ghosh	Chairman, Bihar State Pollution Control Board, Patna.
3.	Dr. MBalasubramanian	Assistant Professor, Centre for Ecological Economics and Natural Resources (CEENR), Institute for Social and Economic Change (ISEC), Bengaluru.
4.	Dr. Chanakya, H. N	Professor, Indian Institute of Sciences, Bengaluru.
5.	Dr. Chetan Singai	Deputy Director, Ramaiah Public Policy Centre, Bengaluru.
6.	Dr. T Dhanalakshmi	Principal, Matha College of Technology, Ernakulam, Kerala.
7.	Smt. Jayanthi, T.A.	Scientist, Centre for Environment and Development, Thiruvananthapuram.
8.	Dr. KSR Murthy	Secretary General, Confederation of Resident Welfare Associations, (CoRWA), Hyderabad.
9.	Mr. Madhusudhan Rao B.V.	Senior Research Advisors, Centre for Budget and Policy Studies Bengaluru.
10.	Mr. Marwan Abubaker	Co- Founder & Director- New Initiatives, Hasiru Dala Innovations, Bengaluru.
11.	Dr. Namasivayam Vasudevan	Professor in Ecology, Centre for Environmental Studies, Anna University, Chennai.
12.	Mr. Pradeep Mishra	Assistant Engineer, Environment & Solid Waste Management, Dept. of Local self govt. Govt. of Rajasthan.
13.	Mr. Ramakanth. N. S.	Member-SWMRT and expert committee, SWM, GOK.
14.	Dr. Sandhya Jayakumar	Nodal Officer (Managed Health Care), BBMP, Bengaluru.
15.	Dr. Sanjay Joshi	Bio Medical Waste Expert, National Solid Waste Association of India (NSWAI), Mumbai.
16.	Dr. Shyamala K. Mani	Sr. Advisor, WASH and Waste Management, CEH, HFI Professor (Retd.) and Sector Advisor, MPD. National Institute of Urban Affairs (NIUA), New Delhi.
17.	Mr.Sreenivasa Murthy M.R. Rtd IAS	Chief Executive, Gokula Education Foundation (Medical), Bengaluru.