

A study of challenges faced by hospitals and third-party logistics in management of biomedical waste

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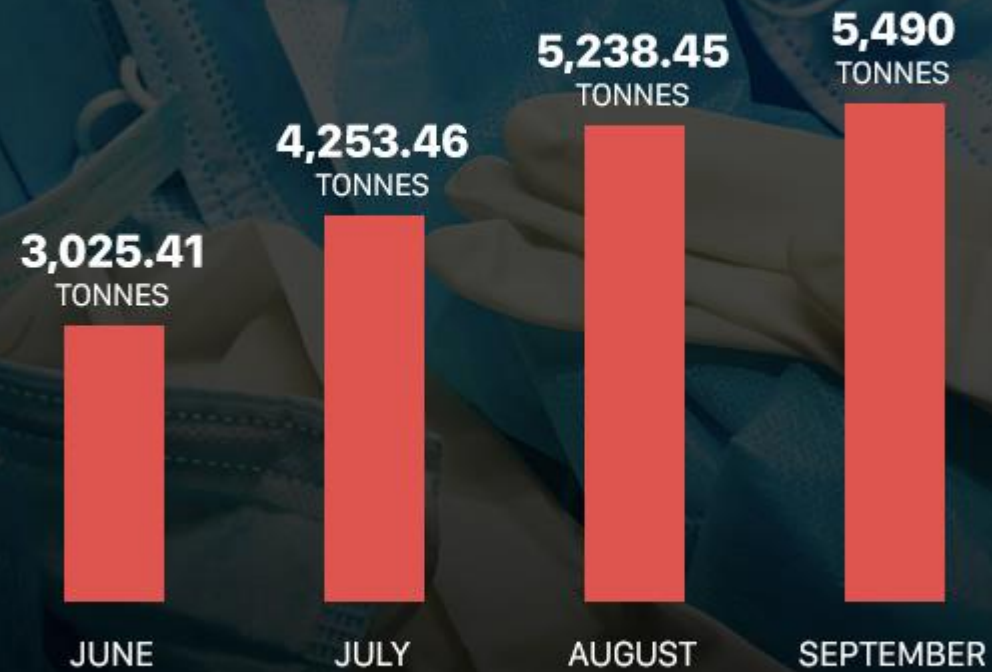


CONTENT

- Introduction
- Literature review
- Methodology
- Results
- Recommendation

India generated **56,898 tonnes** of
BMW between June 2020 and June 2021¹

COVID-19 RELATED BIO-MEDICAL WASTE GENERATION IN INDIA



Source: Central Pollution Control Board (CPCB)

#BanegaSwasthIndia | ndtv.com/swasthindia





LITERATURE REVIEWS

Online ahead of print.

An overview for biomedical waste management during pandemic like COVID-19

V S Kanwar¹, A Sharma¹, Rinku², M Kanwar^{1 2 3}, A L Srivastav¹, D K Soni³

Affiliations + expand

PMID: 35694150 PMCID: PMC9167668 DOI: 10.1007/s13762-022-04287-5

[Free PMC article](#)

Epub 2020 Jul 15.

Nanoparticles impact in biomedical waste management

Pooja M Patil¹, Raghvendra A Bohara^{1 2}

Affiliations + expand

PMID: 32667845 DOI: 10.1177/0734242X20936761

FULL TEXT LINKS

 SAGE journals

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doi: 10.1007/s11356-021-16736-8. Epub 2021 Oct 7.

Biomedical waste generation and management during COVID-19 pandemic in India: challenges and possible management strategies

Ashish Dehal^{1 2}, Atul Narayan Vaidya¹, Asirvatham Ramesh Kumar^{3 4}

Affiliations + expand

PMID: 34622401 PMCID: PMC8496889 DOI: 10.1007/s11356-021-16736-8

Epub 2022 Feb 16.

COVID 19 Pandemic and biomedical waste management practices in healthcare system

Ramkrishna Mondal¹, Siddharth Mishra¹, Jawahar S K Pillai¹, Mukunda C Sahoo¹

Affiliations + expand

PMID: 35360761 PMCID: PMC8963639 DOI: 10.4103/jfmpc.jfmpc_1139_21

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Biomedical waste management practice in dentistry

Aravind Kumar Subramanian¹, B Nivethigaa¹, M Srirengalakshmi¹, Remmiya Mary Varghese¹,
R Navaneethan¹, Harish Babu¹

Affiliations + expand

PMID: 34803273 PMCID: PMC8573458 DOI: 10.6026/97320630016958

[Free PMC article](#)

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ALL EVERYBODY TALKED ABOUT

- How much waste is generated.
- The best practices of managing BMW.
- New technologies that can be used in managing BMW.
- Government guidelines for managing BMW.
- How much 3PL & Hospitals are complying to the rules.
- What new guidelines should be made in order to make 3PL and Hospitals strictly follow the rules.

The image features three solid-colored squares arranged horizontally. From left to right, the colors are green, yellow, and orange. They are positioned to the left of the text 'The Gap ?'.

The Gap ?

Nobody talked about the challenges
Hospitals and 3PL providers face while
managing BMW

- How they can improve.
- What strategies they can use to overcome those challenges.



GOALS

- To determine the priority list of the factors important to manage biomedical waste effectively at the hospital and for third-party logistics service providers.
- To identify the list of major issues faced by both parties in the management of biomedical waste.
- To analyse the identified factors.
- To present a conceptual path/ model for effective BMW management at the hospital and third-party logistics service provider.



RESEARCH METHODOLOGY

- **RESEARCH DESIGN:** In-person interviews.
- **SAMPLING:** Purposive sampling was used as a method to identify volunteers with experience and knowledge of managing biomedical waste.
- **DATA COLLECTION:** Personal interviews were conducted with the selected participants.
- **DATA ANALYSIS:** The SCOR Method was used to categorise the interview data, and the Risk Matrix was used to rank the risks.
- **ETHICAL CONSIDERATIONS:** Informed consent was obtained from the participants. The privacy and confidentiality of the participants will be maintained.
- **LIMITATIONS:** Limited sample size, study's concentration on a particular geographic area.



SIGNIFICANCE

- By highlighting the difficulties experienced by hospitals and 3PL providers in managing biomedical waste, the study will add to the body of knowledge on the management of biomedical waste in India.
- The study's findings will be helpful in formulating plans and regulations to enhance the management of biomedical waste in the healthcare sector.



RESULTS



RISK IDENTIFIED AT HOSPITALS

1. Segregation of waste
2. Staff training
3. Keeping track of the quantity filled in dustbins
4. Dedicated team for bio-waste management
5. Quality polythene usage
6. Preventing dustbins from overfilling
7. Reporting of accidents
8. Storage
9. Cost
10. Public perception
11. Coordination with third-party providers
12. Equipment and technology for management
13. Volume produced
14. Human errors
15. Security Concerns
16. Changes in regulations
17. Limited resources
18. Cultural and language barriers
19. Geographic location
20. Regulatory compliance



APPLYING SCOR MODEL

PLAN-

- Public perception
- Regulatory compliance
- Changes in regulations
- Limited resources
- Cultural and language barriers
- Geographic location

SOURCE-

- Quality polythene usage

MAKE-

- Segregation of waste
- Staff training
- Keeping track of the quantity filled in dustbins
- Dedicated team for bio-waste management
- Preventing dustbins from overfilling
- Volume produced
- Equipment and technology for management

DELIVER-

- Coordination with third-party providers

RETURN-

- Reporting of accidents
- Security Concerns



RISK MATRIX

Likelihood / Impact	Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Rarely (1)	Low	Low	Medium	High	High
Occasional (2)	Low	Medium	Medium	High	High
Frequent (3)	Medium	Medium	High	High	High
Regular (4)	Medium	High	High	High	High
Almost certain (5)	High	High	High	High	High



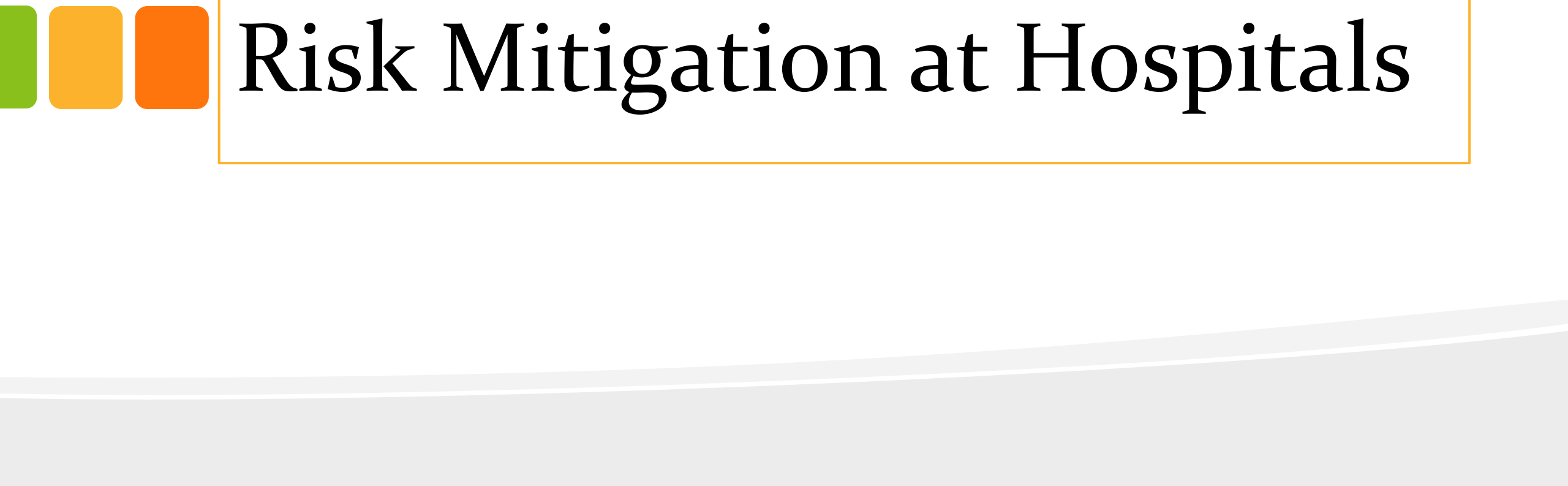
SNAPSHOT OF SCORING

Risk	Likelihood	Impact	Risk Score
Segregation of waste	5	5	25
Staff training	4	5	20
Keeping track of the quantity filled in dustbins	5	4	20
Dedicated team for bio-waste management	3	4	12
Quality polythene usage	2	3	6



TOP 5 IDENTIFIED RISKS

1. Segregation of waste
2. Staff training
3. Keeping track of the quantity filled in the dustbin.
4. Dedicated team for bio-waste management
5. Equipment and technology for management



Risk Mitigation at Hospitals



Segregation of waste

- Establishing a sound waste management strategy
- Providing distinct bins and clear labeling
- Ongoing training for employees
- Regular monitoring and audits



Staff training

- Thorough staff training program.
- Make training a mandate for all.
- Training should include how to handle sharp objects of BMW.



Keeping track of the quantity filled in the dustbin

- Installation of waste monitoring devices
- Regular checks and data analysis
- Precise forecasting and planning
- Identifying systemic faults



Dedicated team for bio-waste management

- Designating a dedicated waste management crew
- Personal protective equipment (PPE) and training
- Equipping the waste management crew



Equipment and technology for management

- Investment in waste management equipment and technologies
- Maintenance and repair of equipment
- Government regulations on equipment standards



RISK IDENTIFIED AT 3PL

1. Segregation of waste
2. Reporting of accidents
3. Non-compliance with regulations
4. Lack of expertise
5. Damage to equipment and technology
6. Transportation risks
7. Security concerns
8. Lack of transparency
9. Cost overruns
10. Cultural and language barriers
11. Inadequate disaster preparedness
12. Inadequate quality control
13. Limited resources
14. Inefficient collection and segregation
15. Inadequate training
16. Dependence on a single 3PL provider
17. Lack of environmental sustainability
18. Inadequate record-keeping



APPLYING SCOR MODEL

PLAN-

- Lack of expertise
- Non-compliance with regulations
- Inadequate disaster preparedness
- Dependence on a single 3PL provider

SOURCE-

- Segregation of waste
- Inefficient collection and segregation
- Inadequate training
- Lack of environmental sustainability
- Cultural and language barriers
- Inadequate quality control
- Inadequate record-keeping

MAKE-

- Damage to equipment and technology
- Cost overruns

RETURN-

- N/A

DELIVER-

- Reporting of accidents
- Transportation risks
- Security concerns
- Lack of transparency
- Limited resources



RISK MATRIX

Likelihood / Impact	Negligible (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Rarely (1)	Low	Low	Medium	High	High
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SNAPSHOT OF SCORING

Risk	Likelihood	Impact	Risk Score
Segregation of waste	5	5	25
Reporting of accidents	2	5	10
Non-compliance with regulations	4	5	20
Lack of expertise	3	3	9
Damage to equipment and technology	2	4	8



TOP 5 IDENTIFIED RISKS

1. Segregation of waste
2. Non-compliance with regulations
3. Reporting of accidents
4. Lack of environmental sustainability
5. Inadequate disaster preparedness



Risk Mitigation at 3PL



Segregation of waste

- Routine audits and inspections
- Staff education on trash segregation and disposal
- Implementation of a waste management plan
- Periodic examination and corrective action



Non-compliance with regulations

- Development of a compliance framework
- Routine audits for compliance
- Staff education on governing laws
- Appointment of a compliance officer or team



Reporting of accidents

- Clear and simple incident reporting procedure
- Continuous training on incident reporting
- Development of an emergency response plan



Lack of environmental sustainability

- Implementation of an environmental management system (EMS)
- Regular audits for environmental sustainability
- Employee education on sustainable practices
- Setting and monitoring sustainability goals



Inadequate disaster preparedness

- Development of a disaster preparedness strategy
- Regular testing and improvement of the preparedness plan
- Staff education on disaster preparedness
- Establishment of a communication strategy



Recommendation

- Comprehensive biomedical waste management approach
 - Regular staff training on waste segregation and disposal
 - Monitoring and waste container management
 - Specialized team for handling biological waste
 - Investment in high-quality waste management equipment
- 

- Maintain communication with 3PL providers
 - Performance evaluation of 3PL providers
 - Strategies for addressing emergencies and disasters
 - Environmental sustainability goals
 - Database for hazard records
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