

No	2. Title	3. Type of Document	4. Issued by	5. Issued date	6. URL	7. Outline
1	The UN Basel Convention's Technical Guidelines on the Environmentally Sound Management of Biomedical and Healthcare Wastes	Guideline	Basel Convention's Regional Centre for Asia and the Pacific, Beijing	2003	<a href="http://bccr.tsinghua.edu.cn/en/atm/7/20200309115829124.pdf">http://bccr.tsinghua.edu.cn/en/atm/7/20200309115829124.pdf</a>	<p>The flowchart shows the summary of observed trend how to manage municipal wastes generated from:</p> <ul style="list-style-type: none"> <li>Household with/without COVID-19 positive people</li> <li>People in mandatory quarantine.</li> </ul> <p>It is notified that the flowchart does not include recommendation or an exhaustive list, but a reflection in terms of trends of what has been observed in the practices shared with the ACR+ (Association of Cities and Regions for Sustainable Resource Management).</p> <p><b>Type of Waste:</b> The key point of the flow is to show the practice that municipal waste generated from the household with COVID-19 positive people including:</p> <ul style="list-style-type: none"> <li>mixed waste,</li> <li>recyclables, and</li> <li>biowaste</li> </ul> <p><b>Storage:</b> Those items are left for 72 hours storage for certain cases at source</p> <p><b>Transportation:</b> Those items are transported with mixed wastes, which requires ad-hoc services such as keeping their waste separated from the municipal stream (specific containers) and frequent collection.</p> <p><b>Treatment:</b> Incineration is prioritized, Mechanical Biological Treatments (MBTs) continue with business as usual when they are highly automated (minimum involvement of operators), or controlled landfill is used for disposal.</p> <p>The municipal waste generated from the household without COVID-19 positive people are separated, collected and transported to be treated with business as usual, but one key point is that during the period, the reporting for recycling targets might be modified according to the increase of mixed waste.</p>
2	Safe management of wastes from health-care activities Second edition	Guideline	World Health Organization (WHO)	2014	<a href="https://www.who.int/water_sanitation_health/publications/safe-management-of-wastes-from-healthcare-activities/en/">https://www.who.int/water_sanitation_health/publications/safe-management-of-wastes-from-healthcare-activities/en/</a>	<p>This is a comprehensive guideline covering for the prevention of environmentally-mediated infections, particularly among health-care workers and immunocompromised patients. There are some chapters related to medical waste management in general as follows:</p> <p><b>1. Categorization of Medical Waste</b> Regulated medical wastes are wastes that represent a sufficient potential risk of causing infection during handling and disposal and for which some precautions likely prudent. Below are suggested categories of medical waste:</p> <ul style="list-style-type: none"> <li>Microbiological laboratory wastes (e.g. cultures and stocks of microorganisms)</li> <li>Bulk blood, blood products, blood and bloody body fluid specimens</li> <li>Pathology and anatomy waste</li> <li>Sharps (needles, scalpels)</li> </ul> <p><b>2. Management of Regulated medical Waste in Healthcare Facilities</b></p> <ul style="list-style-type: none"> <li>Require careful disposal and containment before collection and consolidation for treatment.</li> <li>Require facility to inform personnel involved of potentially infectious waste of the possible health and safety hazard; training in appropriate handling and disposal.</li> <li>Suggest to apply same methods of handling and disposal of regulated medical waste from both isolation areas and other patient care areas.</li> <li>Require proper sharps disposal strategies</li> <li>Require transportation of regulated medical waste in closed, impervious containers to the on-site treatment location or to another facility for treatment</li> <li>Healthcare facilities should have regulated medical waste management plan.</li> <li>Require facilities to develop a plan for the collection, handling, pre-disposal treatment and terminal disposal of regulated medical waste (must be in conjunction with regulations adopted by local/state).</li> <li>Suggest to designate a person or persons to be responsible for establishing, monitoring, reviewing and administering plan.</li> </ul> <p><b>3. Treatment of Regulated Medical Waste</b> In principle, treatment is aimed at decontaminating or reduce the microbial load in or on the waste and to render the by-product safe for further handling and disposal.</p> <ul style="list-style-type: none"> <li>Treat medical waste using a method: steam sterilization, incineration, interment, or alternative treatment technology (e.g. chemical disinfection, energy-based technologies, ex microwave, radio wave, encapsulation).</li> <li>Follow precautions for microbiological waste, i.e. inactivate microbiological waste prior to transport and disposal.</li> <li>Utilizing sanitary sewers for safe disposal of blood, suctioned fluids, ground tissues, excretions, and secretions, provided that local sewage discharge requirements are met and in conjunction with local regulations.</li> </ul> <p><b>4. Special precautions for wastes from care of patient with rare diseases</b></p> <ul style="list-style-type: none"> <li>Contain wastes contaminated with blood or fluid of patients and manage properly</li> <li>Decontaminate with approved methodology before disposal</li> <li>Incinerate medical waste</li> </ul>
3	Safe management of wastes from health-care activities A summary	Guideline	World Health Organization (WHO)	2017	<a href="https://apps.who.int/iris/bitstream/handle/10665/259491/WHO-FWC-WSH-17-05-eng.pdf">https://apps.who.int/iris/bitstream/handle/10665/259491/WHO-FWC-WSH-17-05-eng.pdf</a>	<p>The Centers for Disease Control (CDC) offers for the following information (FAQ) regarding waste management during the COVID-19 concerns especially for the waste/wastewater management company. The principle and recommendation for the waste/wastewater management company are as follows:</p> <ul style="list-style-type: none"> <li><b>Principles</b> Coronavirus is susceptible to the same disinfection practice, includes usage of chlorine bleach and inactivation using UV irradiation. Additional disinfection is not considered necessary.</li> <li>Medical waste from healthcare facilities treating COVID-19 patients is no different with waste coming from facilities without COVID-19 patients. This implied that the routine procedures according to CDC guidelines should be practiced as it is.</li> <li><b>Recommendation</b> Workers should use standard practice including basic hygiene precautions and wear recommended PPE. Contaminated waste should be placed in double bag (used gloves, facemasks, and other disposable items in a bag that can be tied closed before placed in another bag with other wastes)</li> </ul>
4	Guidelines for Environmental Infection Control in Health-Care Facilities (2003)	Guideline	U.S. Department of Health and Human Services Centers for Disease Control and Prevention (CDC)	Jul. 2019 (updated)	<a href="https://www.cdc.gov/infectioncontrol/pdf/guidelines/environmental-guidelines-P.pdf">https://www.cdc.gov/infectioncontrol/pdf/guidelines/environmental-guidelines-P.pdf</a>	<p>This is a guidance for SWM workers and employers to control and prevention the risk of COVID-19. The key points are as follows:</p> <p><b>1. Principles</b></p> <ul style="list-style-type: none"> <li>Medical waste of suspected or contaminated with COVID 19 should be handled like other regulated medical waste</li> </ul> <p><b>2. Recommendation</b></p> <ul style="list-style-type: none"> <li>Continue to use precautions already in place to protect workers from work's hazards, such as engineering and administration controls, safe work practices, wear PPE</li> <li>Employers and managers to review available guidance which suggests the following: (i) Sick employees to stay home, practicing proper sneezing and coughing etiquette, proper hand hygiene; (ii) Routine environmental cleaning of workplace; (iii) Healthy employee notifying supervisor if family member is sick; (iv) Employer notify other employee if an employee is confirmed to have COVID 19 for possible exposure</li> </ul>
5	Guidance on Coronavirus (COVID-19)	Guidance	Solid Waste Association of North America	Mar. 2020	<a href="https://swana.org/docs/default-source/advocacy-documents/guidance-on-coronavirus-2020-03-06.pdf?shrsn-fe6b88a_2">https://swana.org/docs/default-source/advocacy-documents/guidance-on-coronavirus-2020-03-06.pdf?shrsn-fe6b88a_2</a>	<p>This is a comprehensive publication (guideline) used widely in healthcare centers and government agencies to assist in the adoption of national guidance for medical waste management. There are chapters such as:</p> <ul style="list-style-type: none"> <li>Definition and characterization of healthcare waste</li> <li>Legislative, regulatory and policy aspects of healthcare waste</li> <li>Health care waste management planning</li> <li>Health care waste minimization, reuse and recycling</li> <li>Segregation, storage and transport of healthcare waste</li> <li>Treatment and disposal methods</li> <li>Economics of health care waste management</li> <li>Hygiene practices for waste management workers</li> <li>Training, education and public awareness</li> <li>Healthcare waste management in emergency.</li> </ul> <p>In addition, the guideline includes "Healthcare waste management in emergencies" and "Pandemics" chapters considering anticipated malaria-case extension to the world due to the climate change as an example. The interesting points from those chapters are as follows:</p> <ul style="list-style-type: none"> <li><b>Amount of Health Care:</b> The amount of health-care waste will increase during pandemics</li> <li><b>General and Infectious Waste during Pandemic:</b> If a pandemic is spread by contact, even general waste from medical areas may potentially have to be classified as infectious health-care waste.</li> <li><b>Waste Workers Status:</b> The status of waste-management staff should be considered. Unlike health workers, they are generally not included in lists of essential workers who should be prioritized for vaccination.</li> <li><b>Staff Shortages and Loss of Capacity:</b> There may be significant staff shortages and subsequent loss of capacity for waste management staff. This would be most acute where healthcare waste treatment and disposal are conducted at centralized plants away from healthcare facilities.</li> <li><b>Contingency Plans:</b> In their contingency plans to address medical emergencies, countries should include the use of health-care waste engineering advice, realistic transportation and disposal arrangements, and the regular vaccination of waste workers.</li> <li><b>Prompt Waste Removal:</b> This is a prudent approach to maintaining a sufficient level of public health protection through prompt waste removal and processing during an emergency.</li> </ul>
6	Water, sanitation, hygiene, and waste management for the COVID-19 virus	Guidance (Interim)	World Health Organization (WHO)	Mar. 2020	<a href="https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19">https://www.who.int/publications-detail/water-sanitation-hygiene-and-waste-management-for-covid-19</a>	<p>The summary highlights the key aspects of safe health-care waste management in order to guide policy-makers, practitioners and facility managers to improve such services in health-care facilities, which is based on the comprehensive and detailed WHO handbook Safe management of wastes from healthcare activities (above, No. 5, WHO, 2014), and also takes into consideration relevant World Health Assembly (WHA) resolutions, other UN documents and emerging global and national developments on WASH and IPC. Some key points of each chapter are as follows:</p> <p><b>1. Categories of healthcare waste and risks:</b></p> <ul style="list-style-type: none"> <li>Hazardous healthcare waste: infectious waste, sharps, pathological waste, pharmaceutical waste, chemical waste, radioactive waste</li> <li>Non-hazardous or general healthcare waste</li> </ul> <p><b>2. Segregation and collection of waste, there are points to consider:</b></p> <ul style="list-style-type: none"> <li>Segregation should be standardized nationwide</li> <li>Container materials, coding and labelling</li> <li>Collection within the healthcare facilities</li> <li>Scheduled collection time, hazardous and non-hazardous waste to be collected in different time</li> </ul> <p><b>3. Transport within healthcare facilities:</b></p> <ul style="list-style-type: none"> <li>Prevent exposure to staff and patients and to minimize the passage of loaded carts through patient care and other clean areas</li> <li>Wear adequate personal protective equipment (PPE) including gloves, closed shoes, overalls and mask</li> <li>Education and training for transport workers</li> </ul> <p><b>4. Waste storage requirement</b> Location, dimension, appropriate to the type of waste, materials, etc.</p> <p><b>5. Treatment of health care waste (recommend to see "UNEP compendium of technologies for treatment/ destruction of health-care waste (UNEP, 2012)" - this document provides very details of technologies.). There are points to consider:</b></p> <ul style="list-style-type: none"> <li>Available resources including technical expertise.</li> <li>Relevant national regulations and requirements.</li> <li>Waste characteristics and volume.</li> <li>Technical requirements for installation, operation and maintenance of the treatment system.</li> <li>Safety and environmental factors</li> <li>Cost considerations</li> </ul> <p><b>6. Disposal options</b></p> <ul style="list-style-type: none"> <li>General non-hazardous waste disposal options</li> <li>Hazardous waste disposal options</li> <li>Disposal options during emergency</li> </ul>
7	Waste management an essential public service in the fight to beat COVID-19	List of existing related report (Press release)	UN Environment Programme (UNEP)	Mar. 2020	<a href="https://www.unenvironment.org/news-and-stories/press-release/waste-management-essential-public-service-fight-beat-covid-19">https://www.unenvironment.org/news-and-stories/press-release/waste-management-essential-public-service-fight-beat-covid-19</a>	<p>This is a guidance covering water, sanitation, and hygiene in addition to waste management related to COVID-19. The key recommendation on waste management for COVID-19 is as follows:</p> <ul style="list-style-type: none"> <li><b>Human and Material Resources:</b> assigning responsibility and sufficient human and material resources to dispose of COVID 19 medical waste safely</li> <li><b>Safe Collection:</b> Safe collection of waste in designated containers and bags, treat, and then safe disposal of or treated, or both, preferably on-site.</li> <li><b>Personal Protective Equipment (PPE):</b> Healthcare waste handlers should wear appropriate PPE (boots, apron, long-sleeved gown, thick gloves, mask, and goggles or a face shield) and perform hand hygiene</li> </ul>

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8	Coronavirus Disease (COVID-19): Regulated Medical Waste and Sharps Packaging Guidance	Safety policy of from the third party	Stericycle (PS)	Mar. 2020	<a href="https://www.stericycle.com/covid-hub/packaging-guidance">https://www.stericycle.com/covid-hub/packaging-guidance</a>	<p>This is a press release from UNEP to highlight the safe handling, and final disposal of waste related to COVID-19 for effective emergency response. The outline of the press release is as follows:</p> <p><b>1. Principles</b></p> <ul style="list-style-type: none"> <li>- Effective management of biomedical and health care waste requires appropriate identification, collection, separation, storage, transportation, treatment and disposal, as well as important associated aspects including disinfection, personnel protection and training.</li> <li>- Medical wastes generated from household (e.g. contaminated masks, gloves, used or expired medicine) should be treated as hazardous waste and disposed of separately, and collected by specialist municipality or waste management operators.</li> </ul> <p><b>2. Recommendation</b></p> <p>The documents to be referred for information on medical waste management:</p> <ul style="list-style-type: none"> <li>- The UN Basel Convention's Technical Guidelines on the Environmentally Sound Management of Biomedical and Healthcare Wastes describe information and practical aspects of waste management to minimize hazards to human health and the environment. (<a href="http://base1.int/Implementation/TechnicalMatters/DevelopmentofTechnicalGuidelines/TechnicalGuidelines/tabid/8025/Default.aspx">http://base1.int/Implementation/TechnicalMatters/DevelopmentofTechnicalGuidelines/TechnicalGuidelines/tabid/8025/Default.aspx</a>)</li> <li>- Series of guidance documents and best practice on safe handling and final disposal of medical wastes available on website of Basel Convention's Regional Centre for Asia and the Pacific. (<a href="http://brcr.tsinghua.edu.cn/en/co/1257152450718/index.html">http://brcr.tsinghua.edu.cn/en/co/1257152450718/index.html</a>)</li> <li>- Basel Convention's Factsheets on Healthcare or Medical Waste Provide Guidelines on Recycling or Disposing Household Hazardous Waste (The website is not available)</li> <li>- Working Draft on sound management of household waste (<a href="http://www.base1.int/Implementation/HouseholdWastePartnership/OverallGuidanceDocument/tabid/8271/Default.aspx">http://www.base1.int/Implementation/HouseholdWastePartnership/OverallGuidanceDocument/tabid/8271/Default.aspx</a>)</li> </ul>
9	Municipal waste management and COVID-19 Summary of observed trends	Flowchart	Association of Cities and Regions for sustainable Resource management (ACR+)	Mar. 2020	<a href="https://www.acrplus.org/en/municipal-waste-management-covid-19">https://www.acrplus.org/en/municipal-waste-management-covid-19</a>	<p>The guideline is developed in 2003 and providing general information on medical waste management. The guideline includes:</p> <p><b>1. Sources of waste</b> Health care establishment, including hospitals, clinics, medical centers, laboratories, research facilities, blood bank and transfusion center, etc.</p> <p><b>2. Waste identification and classification</b></p> <ul style="list-style-type: none"> <li>- Healthcare waste with same composition as household and municipal waste</li> <li>- Biomedical and health care waste requiring special attention (human anatomical waste, Sharps, Pharmaceutical waste, Cytotoxic pharmaceutical waste, Materials contaminated with blood or body fluids, Infectious waste, Other hazardous waste, Radioactive waste from healthcare)</li> </ul> <p><b>3. Management, treatment and disposal technologies</b></p> <ul style="list-style-type: none"> <li>- Prevention/avoidance: Minimization of hazardous waste and other waste, Give preference to environmentally sounder products and replacing harmful or disposable products with reusable or alternative products.</li> <li>- Segregation, collection, labeling and handling of biomedical and health care waste: Segregation as close as possible to the point of generation, Training and education of employees, supervisors and managers, Policy and plan to be in place for segregation, Segregation uniformly applied throughout the whole country, Common system of labeling and coding of packaging should be developed for biomedical and health care waste</li> <li>- In-house transport and storage: Prevent accumulation of waste at the point of generation, Minimize handling and transportation of waste containers to reduce the likelihood of exposure with specific routes to minimize passage of loaded carts through patient care and other clean areas, Storage requirements: materials, dimension, temperature, location, maintenance, etc.</li> <li>- Packaging and labelling for offsite transport: Packaging requirements: Resistant (puncture proof, leakproof) and sealed bag or containers to prevent spilling: Double bag packaging, Labelling</li> </ul> <p><b>4. Recycling/recovery</b> Identifying opportunities for recycling/recovery</p> <p><b>5. Treatment and disposal technologies, accreditation and environmental impact</b></p> <ul style="list-style-type: none"> <li>- Treatment/disposal methods</li> <li>- Advantages and drawbacks</li> </ul> <p><b>6. Responsibility (Assignment of responsibilities)</b></p> <ul style="list-style-type: none"> <li>- Good administration and organization, adequate legislation and financing, active participation</li> <li>- Specific waste management team to develop waste management plan</li> <li>- Roles and responsibilities of each team member</li> </ul> <p><b>7. Capacity building</b></p> <ul style="list-style-type: none"> <li>- Education of training of personnel, Increase awareness of health, safety and environmental protection issues relating to biomedical and healthcare waste, highlight the responsibilities and role of the employees in the overall management programme, target participants: managers and regulatory staff, e.g. safety advisers: medical doctors: nurses and assistant nurses: and hospital cleaners, waste handlers and drivers, Periodic repetition of course</li> </ul>
10	CDC, TCEQ standards for waste disposal during COVID-19	Q&A	U.S. Department of Health and Human Services Centers for Disease Control and Prevention (CDC)	Apr. 2020	<a href="https://www.columbiacountyfla.com/articles/news-columbus/cdc-tceq-standards-waste-disposal-during-covid-19">https://www.columbiacountyfla.com/articles/news-columbus/cdc-tceq-standards-waste-disposal-during-covid-19</a>	<p>ISWA highlights three overall priorities for waste management during the period of the pandemic of COVID-19 (as of April 2020) as follows:</p> <ul style="list-style-type: none"> <li>- <b>Ensure that waste management, recycling services, treatment and disposal facilities will not be disrupted:</b> Continuity of waste service: waste service is not only for municipal waste but also for hazardous industrial and healthcare waste, Contingency Plan: Prepare contingency plan to ensure continuity of service, involving alternative solutions for personnel, vehicles, infectious waste, accumulation of waste, washing, disinfection and street cleaning services, Recycling: Ensure recycling activities continue by implementing adjustments involving:</li> <li>- <b>Identification of interface (potential site for cross contamination), including:</b> Cleaners in medical facilities, Cleaners in commercial and industrial buildings, Waste management workers in collection crews, Waste management workers on sorting lines, Workers in recycling sorting facilities, Informal and individual collectors of recyclables</li> <li>- <b>Implement strict hygiene norms</b></li> <li>- <b>Provide PPE for workers</b></li> <li>- <b>Adjust operations to minimize contacts to trash (e.g. discontinue manual sorting, adjust emptying procedures for dropboxes, take-back machines, etc.)</b></li> <li>- <b>Adjusting storage of recyclables according to scientific insights regarding viability duration of the virus on different surfaces (suggest to increase storage)</b></li> <li>- <b>Communicate adjustments (practice, schedule, etc.) to citizens and waste worker.</b></li> <li>- <b>For households with positive COVID 19 people or mandatory quarantine:</b> Separate personal waste (masks, handkerchiefs) in specific bag, Double-bag personal waste and keep them in places inaccessible to pests</li> <li>- <b>Recognize the role of waste workers and ensure safe and healthy measures for the waste workers:</b> Continue educational and care provision for workers children and family during pandemic period, Ensure health and safety precautions for waste workers, including: Strict adherence to enhance hygiene norms, Follow the procedure for keeping safe distance and avoid crowding to avoid contamination between workers, Wear PPE to avoid direct contact with trashbins/bags</li> <li>- <b>Safe collection, treatment and disposal of healthcare waste:</b> All infectious health care waste produced during the care of COVID 19 patients should be treated as infectious waste and follow procedures and follow management and safe treatment and disposal, For many developing countries lack of infrastructure to treat healthcare and other infectious and hazardous waste, as an exceptional measure, the waste produced in healthcare facilities during the COVID-19 Pandemics shall be sent to be stored in sanitary or engineered landfills on a separated area, isolated from the regular waste, and with immediate daily cover.</li> </ul>
11	COVID-19 Response International knowledge sharing on Waste Management (WASTE MANAGEMENT DURING COVID-19)	Recommendations	The International Solid Waste Association (ISWA)	Apr. 2020	<a href="https://www.iswa.org/iswa/covid-19/">https://www.iswa.org/iswa/covid-19/</a>	<p>This is information on proper handling of medical waste for customers and in general, from the third party waste operator based on the recommendation from US Department of Transportation (DOT) and the Centers for Disease Control and Prevention (CDC) as follows:</p> <p><b>Responsibility of waste generator:</b></p> <ul style="list-style-type: none"> <li>- Properly segregating, packaging and labeling of regulated medical waste</li> <li>- Using double bag for regulated medical waste, i.e. regulated medical waste is to be placed in a specialized bag/container, sealed and placed in the second bag/container (may be provided by third party operator)</li> <li>- Ensure packaging and documentation of transported regulated medical waste complies with regulation regarding waste classification, packaging, labeling and shipping documentation</li> </ul> <p><b>Responsibility of third party operator</b></p> <ul style="list-style-type: none"> <li>- Clearly define what kind of regulated medical waste accepted (acceptance policy)</li> <li>- Provide clear guidance on handling procedure for waste greater to follow and if possible provide specialized bag/container (<a href="https://www.stericycle.com/StericyclePDF/COVID-19-Stericycle-Generator-Packaging-Guidelines.pdf">https://www.stericycle.com/StericyclePDF/COVID-19-Stericycle-Generator-Packaging-Guidelines.pdf</a>)</li> </ul>
12	UN-Habitat_strategy guidance SWM response to COVID19	Guidance	UN-HABITAT	May 2020	<a href="https://unhabitat.org/sites/default/files/2020/05/un-habitat_strategy_guidance_swm_response_to_covid19.pdf">https://unhabitat.org/sites/default/files/2020/05/un-habitat_strategy_guidance_swm_response_to_covid19.pdf</a>	<p>The guidelines seek to address how to adapt regular municipal waste management services to pandemic situation and support decision maker in developing a solid waste management response strategy to the COVID-19 situation.</p> <p><b>There are 10 points strategy for solid waste management operations in the context of COVID-19:</b></p> <p><b>1. Map sources of waste generation to identify changes in waste amounts/flows and increase efficient use of resource</b> Places generating COVID-19 affected health care hazardous waste (e.g. hospitals, home care centers, testing labs, quarantine camps), Places where waste generation has decreased due to preventive measures, such as schools, commercial complexes, public places, Places where there is fly-tipping</p> <p><b>2. Separate infectious waste in households</b> Ideally, all potentially infectious waste should be put in a bag (double if possible) and sealed. It needs to be handled as residual waste, not meant for material recovery. A colored bag could be assigned for potentially infectious waste. If it is not possible to separate potentially infectious waste from other waste, then all waste from that household should be placed in a bag (double if possible) and sealed. It is also recommended to distribute waste bags to households, especially in low income and informal settlements. Waste reduction should be promoted through the 5Rs (Rethink, Refuse, Reuse, Reduce Recycle).</p> <p><b>3. Maintain and expand waste collection services</b> Human and financial resources, as well as assets for waste collection must be reassigned based on the mapping of waste generation sources (point 1). Regular and increased waste collection services should be offered to identified COVID-19 sources, especially hospitals. The frequency and coverage of waste collection must be increased in communities with common collection points and high population density, especially informal settlements. A designated helpline could be established to improve waste collection services and provide information on waste schedules, special services and directives. Close contact between people must be reduced during waste collection especially in door to door collection.</p> <p><b>4. Ensure safe waste treatment and disposal</b> On-site temporary storage and thermal treatment of potentially infectious waste from all the identified sources in the city needs to be enforced. If thermal treatment for infectious waste is not possible, adequate and safe sanitary landfill measures must be put in place. For the duration of the pandemic, the collected waste should be put in separate cells, covered at least daily with locally available material and access limited to a few personnel. See video guidance from ISWA: "How to Dispose of Healthcare waste in Landfills". Materials going to multi-material recovery plants should also be stored temporarily on-site, if possible, for 72 hours (this span is suggested based on current studies and will be referred and re-adjusted based on new developments). The collected materials can be recycled after storing them for an appropriate time, depending on the material and the latest data on survival time of the virus. Stay updated on the virus survival time on different surfaces (e.g. online COVID-19 resource centers) and adapt measures accordingly. Temporary permits should be given to waste collectors for storing the collected waste before treatment as well as to waste treatment plants.</p> <p><b>5. Protect waste workers, formal and informal</b> The new collection schedule and other related changes in cities' waste management system must be communicated through radio, newspapers, social media and other channels. Citizens should dispose of waste as per guidelines provided by the city. Disposal must be in designated places only, to avoid formation of uncontrolled dumpsites and to enable emergency teams to effectively maintain hygiene within city. Fines could be associated with illegal dumping too.</p> <p><b>6. Regularly communicate with citizens and stakeholders</b> The new collection schedule and other related changes in cities waste management system must be communicated through radio, newspapers, social media and other channels. Citizens should dispose of waste as per guidelines provided by the city. Disposal must be in designated places only, to avoid formation of uncontrolled dumpsites and to enable emergency teams to effectively maintain hygiene within city. Fines could be associated with illegal dumping too.</p> <p><b>7. Engage with Stakeholders</b> Engage and consult with waste stream stakeholders, formal and informal, to identify roles and responsibilities to coordinate on strategies for safe waste collection and treatment, and improve response plan. Coordinate with informal workers to maintain and expand collection services in low income areas and take advantage of the situation to strengthen the informal sector. Collaboration must be explored between NGOs and waste management operators? for corporate social responsibility funds/initiatives, particularly in the context of providing access to PPE kits for the waste workers and spreading awareness.</p> <p><b>8. Accelerate procurement procedures</b> Safety equipment for workers should be purchased and distributed, including to informal workers as quickly as possible if possible. Additional storage bins and collection trucks should be contracted/rented if needed. Coordination among neighboring wards to improve efficiency should be promoted. Central and state funds must be reviewed for possibilities to divert money from existing programs to push activities related to COVID-19.</p> <p><b>9. Apply national and international guidance for health care and medical waste</b> National medical waste handling guidelines must be followed. If no guidelines exist, the international guidelines by WHO should be applied (Safe management of wastes from health-care activities). Collected medical waste must be incinerated. Other treatment options for health care waste could be referred to at UNEP's compendium of technologies.</p> <p><b>10. Design scenarios and contingency plans</b> Learn from other countries on COVID-19 progression/patterns and consider them in each phase of the planning process. Risk assessments associated with failure of continued service (e.g. staff and equipment shortage, closure of recycling, waste treatment and disposal units) must be carried out.</p>
13	Managing Infectious Medical Waste during the COVID-19 Pandemic	Information/Recommendations	Asian Development Bank (ADB)	2020	<a href="https://www.adb.org/publications/managing-medical-waste-covid19">https://www.adb.org/publications/managing-medical-waste-covid19</a>	<ul style="list-style-type: none"> <li>- Based on the PRC experiences, possible generation of additional medical waste are estimated such as 280 t/d for Manila, 212 t/d for Jakarta, 154 t/d for Kuala Lumpur, 210 t/d for Bangkok, and 160 t/d for Hanoi. (The peak management and treatment campaign lasted over 60 days in Wuhan. Other countries will experience different emergency timelines, which are dependent on specific policies and predicted infection curves). The equation for estimation of potential increase in tonnage over time is shown as "increase in infectious medical waste per day of outbreak = 3.4kg x estimated infected person"</li> <li>- Households containing a person under investigation (PUI) or person under monitoring (PUM) should be encouraged to segregate all medical waste (face masks, wipes, tissues). If dedicated medical waste collection is available, then the double-bagged waste should be disposed of immediately.</li> <li>- If no dedicated medical waste collection is available, then the double-bagged waste should be stored for 72 hours before being disposed with the general household waste. As a temporary measure, secure facilities can be used as temporary storage in anticipation of additional emergency resources becoming available in the medium term.</li> <li>- Safe transport requires vehicles that can be sterilized, trained drivers and waste collectors, dedicated routes, and vehicle and waste tracking systems. Training must be conducted for crews who will be exposed to household infectious medical waste.</li> <li>- Sanitary landfills, medical incinerators, and medical autoclaves are used to deal with pre-pandemic waste amounts. Other resources including mobile incinerators, industrial furnaces, and cement kilns could be assessed for use if existing systems are overloaded and capacity is limited.</li> <li>- Transport and disposal elements of the system will be the first to be overwhelmed.</li> <li>- Intermediate sorting of waste will result in higher infection rates and dispersal of infected waste. The risk of infected waste being handled multiple times needs to be avoided. This risk is particularly high with informal sector workers. All municipal waste should be treated as non-recyclable and disposed of through incineration or sanitary landfill.</li> <li>- Reschedule municipal solid waste collection frequency according to reduced workforce availability and reallocate available assets for infectious medical waste management. Recycling activities should be avoided to prevent human contact with any potentially infectious domestic and medical waste.</li> </ul>



No.	Title	Type of Document	Issued By	Issued Date	URL	7. Outline	16. COVID-19 specific issues						Other			
							16.1. Any COVID-19 issues related to the	16.2. Policy, Regulatory Issues	16.3. Technical Working Group	16.4. Separation	16.5. Data	16.6. Transmission (See Modeling)		16.7. Treatment Technology	16.8. Diagnostics	16.9. Assessment, Testing
10	Managing the Risk of a Second Wave During the COVID-19 Pandemic	Technical/Policy Document	World Development Bank (WDB)	2020	<a href="#">https://www.wdb.org/publications/2020/07/20200701-managing-the-risk-of-a-second-wave-during-the-covid-19-pandemic</a>	<p>During the COVID-19 outbreak in India, the Republic of China (ROC) infection control and management measures have been very effective. The ROC government has implemented a series of measures to control the spread of the virus, including strict quarantine measures, extensive testing, and contact tracing. The ROC government has also implemented a series of measures to support the economy and the health of the population, including financial support, tax relief, and social security measures. The ROC government has also implemented a series of measures to improve the health care system, including increasing the number of hospital beds, increasing the number of health care workers, and improving the quality of health care services. The ROC government has also implemented a series of measures to improve the public health system, including increasing the number of public health workers, increasing the number of public health facilities, and improving the quality of public health services. The ROC government has also implemented a series of measures to improve the health care system, including increasing the number of health care workers, increasing the number of health care facilities, and improving the quality of health care services. The ROC government has also implemented a series of measures to improve the public health system, including increasing the number of public health workers, increasing the number of public health facilities, and improving the quality of public health services.</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>	<p>16.1. Policy, Regulatory Issues</p> <p>16.2. Policy, Regulatory Issues</p> <p>16.3. Technical Working Group</p> <p>16.4. Separation</p> <p>16.5. Data</p> <p>16.6. Transmission (See Modeling)</p> <p>16.7. Treatment Technology</p> <p>16.8. Diagnostics</p> <p>16.9. Assessment, Testing</p>

No	1. Country	Sub-No	2. Title	3. Document type	4. Issued by	5. Issued date
1	China	1-1	Notice on Environmental Management of Medical Waste Caused by COVID-19	Notification	Department of Solid Waste and Chemicals, Ministry of Ecology and Environment	Jan. 2020
2	China	1-2	Emergency Response Assistance to the Outbreak of Coronavirus Disease 2019 in China	Project document	Foreign Environmental Cooperation Centre, Ministry of Ecology and Environment of China (FECO/MEE) and UNIDO	2020
3	Ethiopia	2.1	Ethiopian Food, Medicine and Healthcare Administration and Control Authority	Guideline	Food, Medicine and Healthcare Administration and Control Authority	Jun-05
4	Ethiopia	2.2	Medicines Waste Management and Disposal Directive.	Guideline	Food, Medicine and Healthcare Administration and Control Authority of Ethiopia	Aug-11
5	India	3.1	Regulatory frame work for management of bio-medical waste generated in the country	Notification	Ministry of Environment, Forestry and Climate Change	Mar. 2016
6	India	3.2	Guide for handling, treatment and disposal of waste generated during treatment/diagnosis/quarantine of COVID-19 patients (revision-1)	Guideline	Central Pollution Control Board	Mar. 2020
7	Japan	4-1	Guideline on waste management during the novel influenza event	Guideline	Ministry of Environment	Mar. 2009
8	Japan	4-2	Manual on Infectious Waste Management based on Waste Management and Public Cleansing Act	Manual	Ministry of Environment	Mar. 2018
9	Japan	4-3	Infectious waste management related to COVID-19_ver.1	Notification	Ministry of Environment	Jan. 2020
10	Japan	4-4	Infectious waste management related to COVID-19_ver.2	Notification	Ministry of Environment	Jan. 2020
11	Japan	4-5	Infectious waste management related to COVID-19_ver.3	Notification	Ministry of Environment	Mar. 2020
12	Japan	4-6	How to dispose the infectious waste (mask, etc.) for households	Flyer	Ministry of Environment	Mar. 2020
13	Japan	4-7	About COVID-19 waste for healthcare facilities and waste management service provider	Flyer	Ministry of Environment	Mar. 2020
14	Japan	4-8	Q & A book for COVID-19 waste management	Q & A booklet	Ministry of Environment	May. 2020
15	Kenya	5-1	MCA (Environmental Management and Coordination Act) Waste Management Regulations 2006 (Revised in 2012)	Regulation	N/A	2006/2012
16	Kenya	5-2	National Policy on Injection Safety and Medical Waste management	Policy	Ministry of Health	Feb. 2007
17	Kenya	5-3	National Infection Prevention and Control Guidelines for Health Care Services in Kenya	Guideline	Ministry of Public Health And Sanitation, Ministry of Medical Services	Dec. 2010
18	Kenya	5-4	Safe management and disposal of waste arising from safety products in prevention of spread of COVID-19	Regulation	Ministry of Health	Apr. 2020
19	Malaysia	6-1	Clinical wastes in Malaysia	Guideline	Department of Environment	Jan./Feb. 2005
20	Malaysia	6-2	Guideline on the handling and management of clinical wastes in Malaysia	Guideline	Department of Environmental Management	2009
21	Malaysia	6-3	Clinical waste handling and obstacles in Malaysia	Research paper	Journal of Urban and Environmental Engineering, v.4, n.2, p.47-54 (ISSN 1982-3932 doi), Department of Environmental Management	Mar. 2010
22	Malaysia	6-4	Environmental Policy In Malaysia: Biomedical Waste, Strategies And Issues	Research paper	Journal of Administrative Science, Vol.10, Issue 1, 2013, Faculty of Administrative Science and Policy Studies, University Teknologi MARA (UiTM), Malaysia	2013
23	Malaysia	6-5	State of the 3Rs in Asia and the Pacific (Malaysia)	Report	Prof. Agamulhu Pariatamby Center for Research in Waste Management, Institute of Biological Sciences, University of Malaya	Nov. 2017
24	Mexico	7	(Official Mexican Standard NOM-087-ECOL-SSA1-2002, Environmental protection, Environmental health, biological-infectious hazardous waste, classification and handling specifications)	Standard	N/A	2003
25	South Africa	8-1	Gauteng Health Care Waste Management Regulations 2004 (south Africa)	Regulation	Department of Agriculture, conservation and environment	2004
26	South Africa	8-2	Western Cape Health Care Waste Management Act, 2007.	Act	Province of Western Cape	Dec. 2007
27	South Africa	8-3	Western Cape Health Care Risk Waste Management Regulations, 2013	Provincial notice	Department of environment affairs and development planning	Mar. 2013
28	South Africa	8-4	Guideline on management of COVID-19 healthcare waste	Guidelines	Department of Health	Mar. 2020
29	South Africa	8-5	Waste management response to COVID19 pandemic in South Africa – Western Cape perspective	PPT document	Eddie Hanekom, Western Cape Government Director Waste Management	2020
30	South Africa	8-6	National public hygiene strategy and implementation plan	Strategy	Department of Health	Apr. 2020
31	Sri Lanka	9-1	Interim Guideline for Management of Solid Waste Generated by Households and Places under Self-Quarantine due to COVID-19 Outbreak	Guideline (Interim)	Ministry of Public Administration, Home Affairs, Provincial Councils & Local Government	Mar. 2020
32	Sri Lanka	9-2	Waste management guideline for COVID-19 quarantined households	Guideline	Ministry of Public Administration, Home Affairs, Provincial Councils and Local Government	Apr. 2020











