Health-Care Waste Management in COVID-19 context: Best and Sustainable Practices

Dr Malini R Capoor

Professor, Microbiology

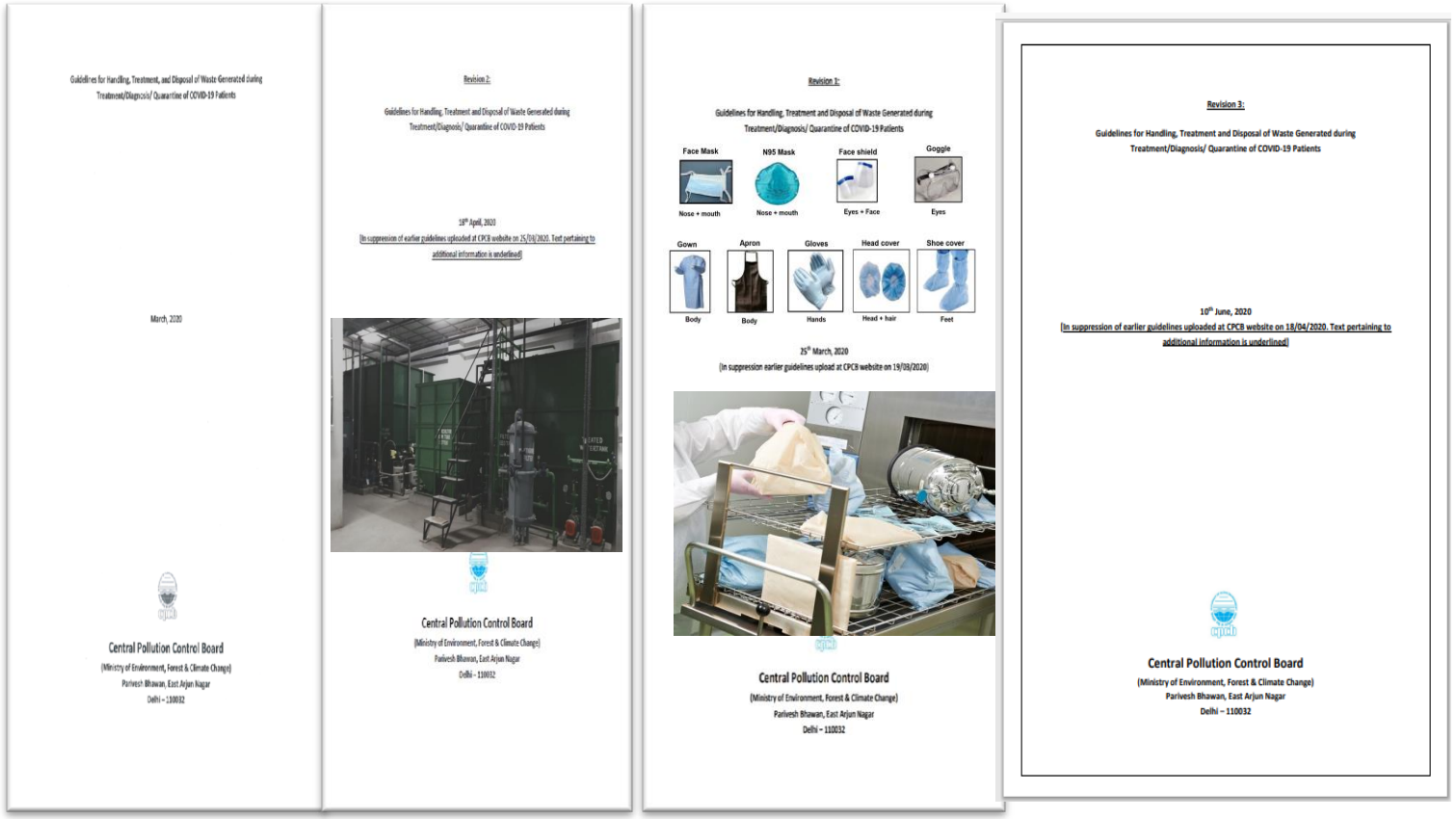
VMMC & Safdarjung Hospital, New Delhi, India

SW Rules 2016 & BMWM Rules 2016, 2018, 2019

CPCB BMWM guidelines for COVID, 2020

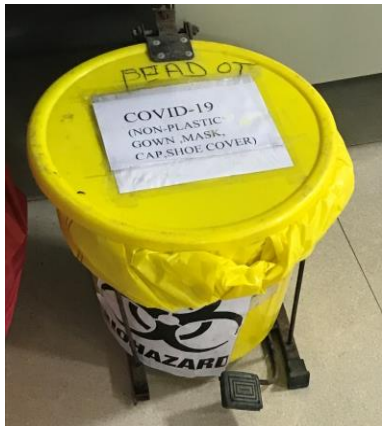
Guidelines for management of waste generated during diagnostics and treatment of COVID-19 suspected/confirmed patients, are required to be followed by stakeholders in addition to existing practices under BMW Management Rules, 2016

18 March 2020 **25 March 2020** **18 April 2020** **10JUNE 2020**

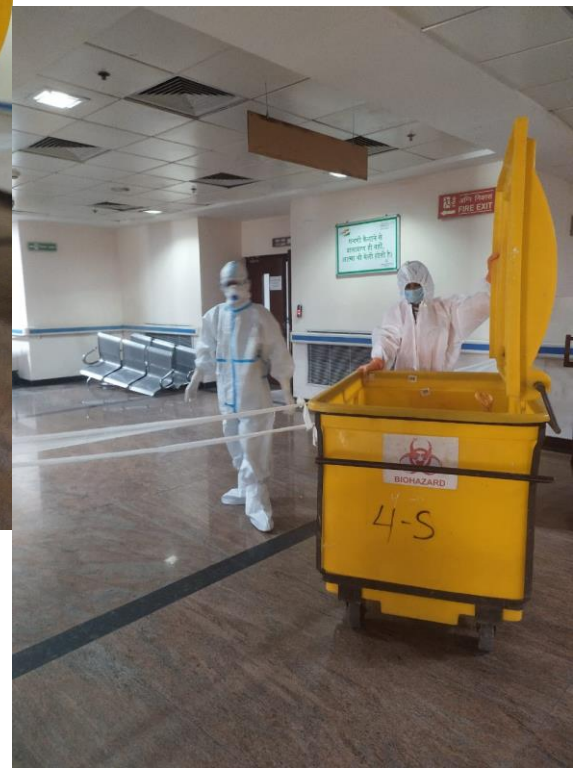


Labelling and double bag

- **Collect and store BMW: Foot operated bin with lid labelled as “COVID-19” : CWS: CBWTFs to expedite disposal upon receipt**
- **Separate colour coded bins/bags/container/trolleys maintain proper segregation of waste as per Rules**
- **Inner and outer surface of containers/bins/trolleys – disinfect 1% sodium hypochlorite**
- **General waste not having contamination: solid waste as per SWM Rules, 2016**

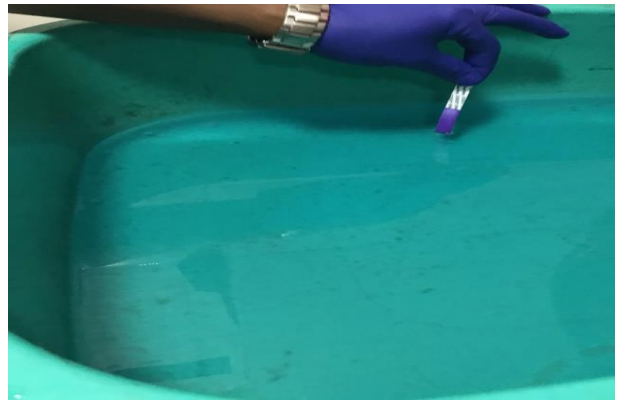


Isolation ward – nursing station, patient area



Pretreatment HCF – lab waste, samples, blood bags – sterilization log6

- Waste autoclave HEPA vs Vertical vs Microwave Std
- **Specifications** graphic or computer recording devices:
- **Safety standards** of ISI/BIS/ISO/EN installation of in NABL/NABH
- **Validation test** – records
  - Chemical control
    - Browne's tubes
    - Bowie Dick test: each batch, >1sr
  - Microbiological control – spore test
    - *B. stearothermophilus*1w (autoclave $1x10^6$)
    - *B. atropheus* $1x10^4$ (Microwave)
  - Physical control – temp & pressure record
- **Pre-treat viral transport media, plastic vials, vacutainers, Eppendorf t plastic cryovials, pipette tips, as per BMWM Rules, 2016: red bags**
- **Pretreat Catridges of genexpert, chips&microtubes of Truenat then R**




BIO-H BAG
BIO-MEDICAL WASTE COLLECTION BAG
Non Chlorinated Polyethylene Bags
BIO-HAZARD
INFECTIOUS-HANDLE WITH CAUTION
ISO & CE CERTIFIED UNIT


SHARPS WASTE
CAUTION
BIOHAZARD


SHARPS WASTE
CAUTION
BIOHAZARD

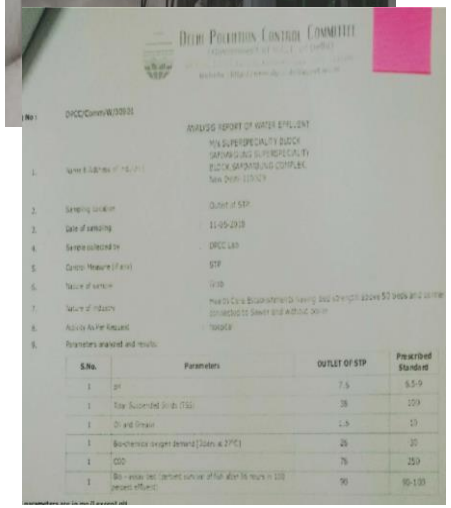

GENIST
BIOHAZARD


Vertical position favors the output of air and the pathway of water-vapor
Horizontal position makes it difficult for the air to move out and the water-vapor to go through


COVID-19
(SEALED AUTOCLAVABLE BAGS)
RED BAG

Management of wastewater from HCFs

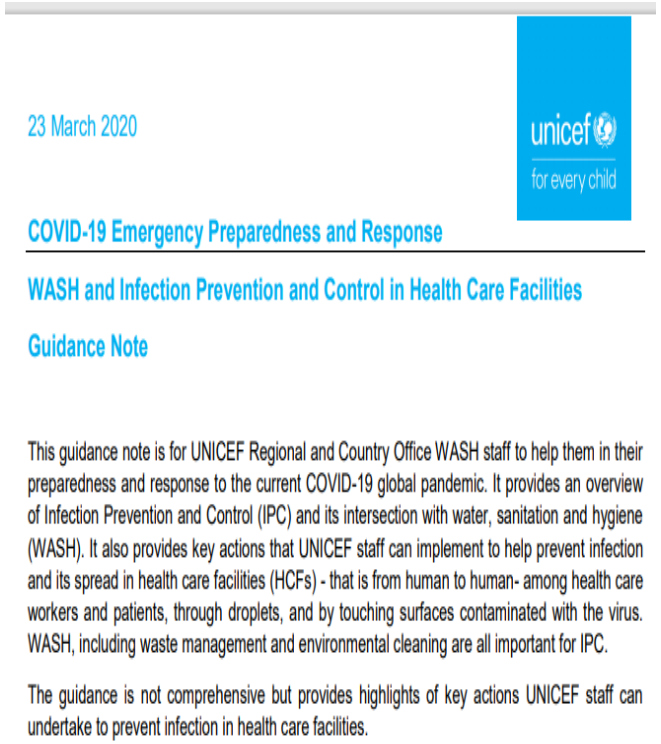
- CDC – risk of transmission COVID-19 thru sewage is low; operators treatment of STPs: no evidence: WHO WASH 2020
- Agencies: HCFs/isolation wards/operators of terminal STP (PHED/Jal Board/etc.)
- **Agencies to ensure disinfection of treated wastewater as per prevailing practices to inactivate coronaviruses**
- **Operators of ETPs/STPs – standard operational practices, practice basic hygiene precautions, and wear PPEs (goggles, face mask , liquid repellent coveralls, waterproof gloves and rubber boots)**



BMWM in COVID-19 context: Challanges

- Training – Social distancing, MS Team, small batches, All
- Social distancing
- Collection of waste
- Barcoding
- Hand hygiene, Resp. etiquette
- ALL: GENERAL Population USING PPE: PPE in SW
- Health checkup/screening
- Immunization
- ETP/STP Plants
- CPCB Mobile App for COVID waste

HCWM: International GUIDANCE: WHO WASH, UNDP



23 March 2020

unicef
for every child

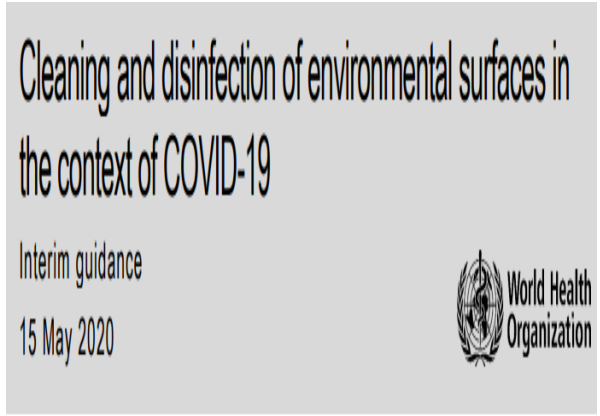
COVID-19 Emergency Preparedness and Response

WASH and Infection Prevention and Control in Health Care Facilities

Guidance Note

This guidance note is for UNICEF Regional and Country Office WASH staff to help them in their preparedness and response to the current COVID-19 global pandemic. It provides an overview of Infection Prevention and Control (IPC) and its intersection with water, sanitation and hygiene (WASH). It also provides key actions that UNICEF staff can implement to help prevent infection and its spread in health care facilities (HCFs) - that is from human to human- among health care workers and patients, through droplets, and by touching surfaces contaminated with the virus. WASH, including waste management and environmental cleaning are all important for IPC.

The guidance is not comprehensive but provides highlights of key actions UNICEF staff can undertake to prevent infection in health care facilities.



Cleaning and disinfection of environmental surfaces in the context of COVID-19

Interim guidance

15 May 2020

World Health Organization

Background

Coronavirus disease 2019 (COVID-19) is a respiratory infection caused by SARS-CoV-2 (COVID-19 virus). The COVID-19 virus is transmitted mainly through close physical contact and respiratory droplets, while airborne transmission is possible during aerosol generating medical procedures.[1] At time of publication, transmission of the COVID-19 virus had

buildings, faith-based community centres, market transportation, and business settings.[10,11] Although the precis role of fomite transmission and necessity for disinfectio practices outside of health-care environments is currentl unknown, infection prevention and control principle designed to mitigate the spread of pathogens in health-car

UNDP

GEF
GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

GLOBAL HEALTHCARE WASTE PROJECT

Safe management of wastes from health-care activities

A summary

World Health Organization

Safe management of wastes from health-care activities

Second edition

Edited by Yves Chartier, Jorge Emmanuel, Ute Pieper, Annette Prüss, Philip Rushbrook, Ruth Stringer, William Townend, Susan Wilburn and Raki Zghondi

World Health Organization

MODULE 17:

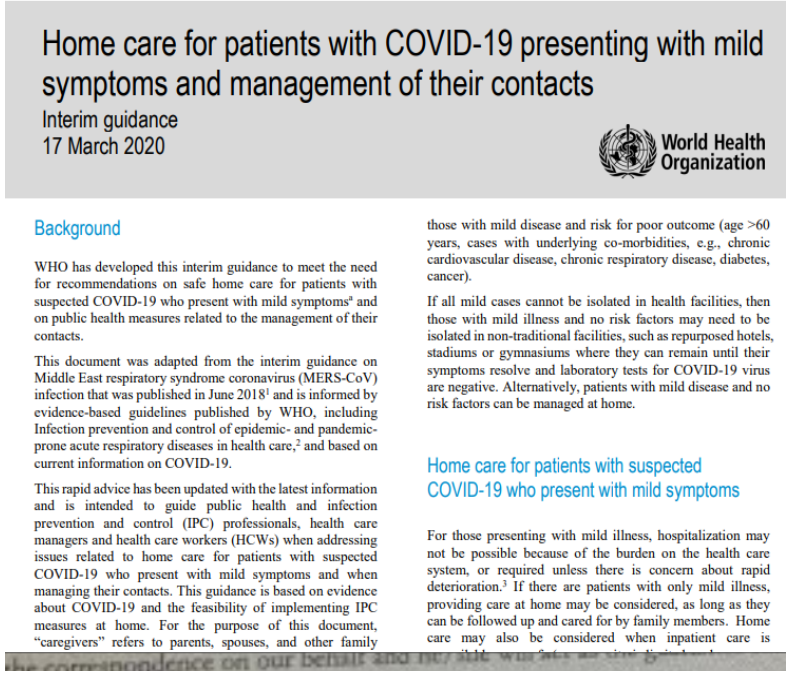
Management of Specific Infectious Wastes

Waste Management in COVID 19 Context

- Follow the national regulations / WHO WASH guidance on infectious waste treatment
  - Treat coronavirus waste as any infectious waste
  - Segregate waste at source
  - Dispose in an infectious waste in foot operated bin, with a suitably color cod
  - Proper handling collection, transport and storage
  - Use PPE (mask, face shield, heavy duty gloves, long sleeve gown, boots) h
  - Use safe and environmentally sound treatment methods
  - Centralized treatment facility using autoclave, microwaves
  - Hybrid stream systems, microwaves, ecofriendly treatment methods
  - On-site Chemicals disinfection low resource settings bleach, pressure cooker a highest setting (30 m), encapsulation and sanitary burial
  - Cut masks and other PPE: reports that they are being illicitly resold
  - Follow routine disinfection and cleaning protocols for waste bins.

Disposal of waste in community environment

- International guidance: waste generated in community: general waste
- CDC: virus can last up to 3 d on hard surfaces- plastic, less on porous
- There is no need to treat these materials with disinfectant first.
- People: wear cloth masks in public, but gloves are not necessary
- PHE: untreated waste be left for 72 h: MSW



Home care for patients with COVID-19 presenting with mild symptoms and management of their contacts

Interim guidance
17 March 2020

World Health Organization

Background

WHO has developed this interim guidance to meet the need for recommendations on safe home care for patients with suspected COVID-19 who present with mild symptoms[a] and on public health measures related to the management of their contacts.

This document was adapted from the interim guidance on Middle East respiratory syndrome coronavirus (MERS-CoV) infection that was published in June 2018[1] and is informed by evidence-based guidelines published by WHO, including Infection prevention and control of epidemic- and pandemic-prone acute respiratory diseases in health care,[2] and based on current information on COVID-19.

This rapid advice has been updated with the latest information and is intended to guide public health and infection prevention and control (IPC) professionals, health care managers and health care workers (HCWs) when addressing issues related to home care for patients with suspected COVID-19 who present with mild symptoms and when managing their contacts. This guidance is based on evidence about COVID-19 and the feasibility of implementing IPC measures at home. For the purpose of this document, "caregivers" refers to parents, spouses, and other family

those with mild disease and risk for poor outcome (age >60 years, cases with underlying co-morbidities, e.g., chronic cardiovascular disease, chronic respiratory disease, diabetes, cancer).

If all mild cases cannot be isolated in health facilities, then those with mild illness and no risk factors may need to be isolated in non-traditional facilities, such as repurposed hotels, stadiums or gymnasiums where they can remain until their symptoms resolve and laboratory tests for COVID-19 virus are negative. Alternatively, patients with mild disease and no risk factors can be managed at home.

Home care for patients with suspected COVID-19 who present with mild symptoms

For those presenting with mild illness, hospitalization may not be possible because of the burden on the health care system, or required unless there is concern about rapid deterioration.[3] If there are patients with only mild illness, providing care at home may be considered, as long as they can be followed up and cared for by family members. Home care may also be considered when inpatient care is

Treatment options

- Susceptible to soap and most normal disinfectants. WHO recommends: Log3 reduction
  - 70-90%ethylalcohol: disinfect reusable dedicated equipmt:thermometer:WHO WASH
  - Sodium hypochlorite at 0.1% for disinfection of general env disinfectn touch surfaces
  - Hydrogen Peroxide >=0.5%

- Steam based treatment : autoclaving or microwaving preferred for treatment of waste
- Sustainable changes with long term changes in system strengthening: Norms
- Strengthen tracking, avoid more incineration
- After disinfection, waste can be sent for disposal
- Recycling should continue as normal

As 1% Bleach or 70°C inactivates COVID-19 (SARS CoV-2) in 5 minutes: OPTIONS

- Treatment technologies

  Autoclaves that typically operate between 121°C to 135°C for 3o min.

  Microwave units that's typically operate between 97°C to 100°C for 30 min

  Alkaline hydrolysis operating with hydroxide at around 150°C

  Dry Heat Treatment system that reach 177°C

  Hydroclaves and hybrid stream system operating between 121°C to 132°C

❖ STAATT criteria 4 Log kill of Geobacillus stearo thermophillus

Key Messages

- **HCWM: duty of all stakeholders**
- **HCWM with social distancing, hand hygiene, PPE, respiratory etiquette**
- **Follow National Rules and International Guidance CDC/WHO**
- **General Population using PPE: MSW bins**
- **Decreasing Incineration Category waste**
- **Follow BAT, BAP, Sustainable, Ecofriendly Technology**
- **PPE: ALL sanitation workers in COVID ward, Labs, ICU**
- **HCWM essential health service**
- **Public health concern**