Guidance on routine and deep cleaning of workplaces when COVID-19 positive cases have been identified

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Contents

1. Background

According to the World Health Organization (WHO), the two main routes of transmission of the SARS-CoV-2 is droplet and direct contact transmission. Respiratory droplets are generated when an infected person coughs or sneezes and any person who is in close contact is at risk of being exposed to these droplets. Droplets may also land on surfaces where the virus could remain viable. Therefore, the immediate environment of an infected individual can serve as a source of contact transmission [1].

Kampf et al., (2020) reviewed the literature of 22 studies addressing the persistence of human and veterinary coronaviruses on inanimate surfaces as well as inactivation strategies with biocidal agents [2]. Their analysis revealed that, human coronaviruses such as the Severe Acute Respiratory Syndrome (SARS) coronavirus, the Middle East Respiratory Syndrome (MERS) coronavirus or endemic human coronaviruses (HCoV) can persist on inanimate surfaces like metal, glass or plastic for up to 9 days. However, these coronaviruses can be efficiently inactivated within 1 minute of contact time by surface disinfection procedures containing either ethanol (62 - 71%) [3], hydrogen peroxide (0.5%) [4] or sodium hypochlorite (0.1% or 0.5%) [5]. It is expected that SARS-CoV-2, the virus strain that causes coronavirus disease 2019 (COVID-19) would have similar characteristics of other coronaviruses. Therefore, as no specific therapies are available for SARS-CoV-2, the authors suggest that early containment and prevention of further spread is crucial to stop the ongoing outbreak of SARS-CoV-2.

Moreover, van Doremalen et al., (2020) have evaluated the stability of SARS-CoV-2 specifically under experimental settings [6]. The authors have estimated the decay rates of SARS-CoV-2 in aerosols and on various surfaces (i.e. plastic, stainless steel, copper, and cardboard) and showed that SARS-CoV-2 was more stable on plastic and stainless steel than on copper and cardboard, and survived for up to 72 hours. On copper and cardboard, no viable SARS-CoV-2 was measured after 4 hours and after 24 hours, respectively. Chin et al., (2020), on the other hand, showed that no viable SARS-CoV-2 could be detected on day 7 from stainless steel and plastic, on day 4 from glass and banknotes, on day 2 from treated wood and cloth and after 3 hours from printing and tissue paper [7]. They could also show that a very low but yet detectable level of virus could be present on the outer layer of a surgical mask on day 7 [7].

It is therefore critical to conduct regular cleaning and disinfection of surfaces in workplaces and public places to control the contact transmission and the spread of COVID-19 [8].

2. Aim

The aim of this document is to provide guidance on routine cleaning of non-health care workplaces as well as deep cleaning when COVID-19 positive cases have been identified. The document starts with definitions of terms used frequently (Section 3) and then provides a detailed description (Section 4) on routine workplace cleaning and disinfection. Section 5 addresses deep cleaning and disinfection required once a COVID-19 case has been identified. Important considerations of personal protective equipment (PPE) and hand hygiene during cleaning and disinfection are discussed in Section 6. A few advances in cleaning methods are listed in Section 7 and the document concludes with educating workers on proper cleaning and disinfection methods for the workplace (Section 8), important measures required for the workplace (Section 9) and lastly considerations for waste generated in the workplace (Section 10).

The information sources consulted for the compilation of this document included national sources i.e. Department of Health (DoH)[1] and National Institute for Communicable Diseases (NICD)[2] as well as international sources i.e. the Occupational Safety and Health Administration (OSHA)[3], the Centers for Disease Control and Prevention (CDC)[4], the National Institute for Occupational Safety and Health (NIOSH)[5], the World Health Organization (WHO)[6], United Nations[7] and the Australian government[8].

3. Definitions of terms

- **General cleaner:** Worker employed to clean and disinfect communal, administrative and non-laboratory spaces, which includes corridors, offices, bathrooms, kitchens, tearooms etc.
- **Laboratory-based cleaner:** Research assistants, medical scientists, lab managers, lab technologists, lab technicians and lab assistants who are responsible for cleaning and

[1] http://www.health.gov.za/
[2] https://www.nicd.ac.za/
[3] https://www.osha.gov/
[4] https://www.cdc.gov/
[5] https://www.cdc.gov/niosh/index.htm
[6] https://www.who.int/
[7] https://www.un.org/en/
[8] https://www.health.gov.au/

disinfecting laboratory-based spaces containing specialized laboratory equipment, research-related and routine chemicals and reagents.

- **Chemical cleaners:** Chemicals that remove dirt through wiping, scrubbing or mopping [9].
- **Cleaning:** The physical removal of dirt and impurities, including germs and microorganisms, from surfaces and involves using soap and water.
- **Deep cleaning:** A complete and enhanced cleaning procedure involving both thorough cleaning and disinfection of the workplace. Also known as terminal or infectious clean [10].
- **Deep cleaning by fogging:** Deep cleaning involving the spraying of a disinfectant using a fogging machine. Also known as spraying, fumigation or misting.
- **Deep cleaning by wiping:** Deep cleaning involving the application of a disinfectant using cloths or wipes.
- **Decontamination:** The removal of pathogenic microorganisms from objects so they are safe to handle, use, or discard [11].
- **Detergents:** Chemicals that have no killing ability but do remove organic matter, which contain microbes and thereby reduce environmental contamination [8].
- **Disinfection:** First clean the area or item with soap and water or another detergent if it is dirty. Then, use a household disinfectant, for example chemical disinfectants to kill pathogenic microorganisms on surfaces. The process does not necessarily clean dirty surfaces or remove pathogenic microorganisms. However, killing pathogenic microorganisms remaining on a surface after cleaning further reduces any risk of spreading infection [12].
- **Disinfectants:** Contain chemicals that destroy or inactivate microorganisms that cause infections. Disinfectants are critical for infection control in hospitals, laboratories and other health care settings.
- **Electronics:** Includes but not limited to cell phones, desktop computers, printers, laptops and tablets, touch screens, keyboards, remote controls, ATM machines.
- **Highly-touched surfaces:** Are frequently touched surfaces. Includes but not limited to tables, chairs, countertops, desks, working surfaces, doorknobs, door handles, window handles, light switches, lift buttons, railings, handles, phones, keyboards, toilets, faucets, sinks, etc. High-touched surfaces are a high-risk for cross-transmission by pathogens that are transferred from individuals [8], [13].

- **Laundry:** Includes but not limited to clothing, towels, linens, lab coats and other items.
- **Minimally (or low)-touched surfaces:** Includes but not limited to floors, walls, ceilings, blinds, etc. [8].
- **Sanitizers:** Contains chemicals that reduce, but do not necessarily eliminate, microorganisms such as bacteria, viruses and moulds from surfaces. Public health codes may require cleaning with the use of sanitizers in certain areas, like toilets and food preparation areas. In general, disinfectants and sanitizers are more hazardous to human health and the environment than detergents [13].
- **Soft (porous) surfaces:** Includes but not limited to soft surfaces such as carpeted floors, rugs, upholstered chairs, and drapes.

4. Detailed information on routine cleaning for workplaces

Routine cleaning (i.e. using water and detergents) and other housekeeping practices as well as disinfection procedures (i.e. applying disinfectant to frequently touched surfaces or objects after cleaning) are appropriate for SARS-CoV-2 in workplace settings. These include patient care areas or laboratories in healthcare settings, and where aerosol-generating procedures are performed [11], [14].

4.1. General cleaning principles

- The use of soap, water and friction is effective, cheap and simple and is the first step in the cleaning process.
- Cleaning alone does not kill microorganisms; however, removal decreases their number and therefore any risk of spreading infection [12], [14].
- Routine environmental cleaning of highly-touched surfaces in workplaces is an essential part of disinfection. Organic matter and dirt can inactivate many disinfectants or reduce the disinfectants ability to kill germs. Cleaning reduces the soil load, allowing a disinfectant to work i.e. reduces bioburden. Removal of the virus that causes COVID-19 requires thorough cleaning followed by disinfection. Practice routine cleaning of frequently touched surfaces [11].
- Do not use compressed air or water to clean potentially contaminated surfaces, as these may aerosolize infectious material [13].
- Cleaning schedules and procedures must be planned so that cleaning progresses from the least soiled to the most soiled area.

- In addition, cleaning must be conducted from the top to the bottom within a room so that debris may fall on the floor, which is then cleaned last [14].
- All areas must be cleaned systematically to avoid missing areas.
- No additives (such as scouring agents, disinfectant, or floor polish) are necessary during cleaning since this will deactivate the active cleaning ingredients in the detergent. These are usually applied after cleaning has taken place.
- Attention in cleaning must be paid to both highly-touched and minimally-touched surfaces [8], [12].

4.2. General disinfection principles

- The routine use of a disinfectant in the environment is strongly discouraged as it is wasteful and promotes antimicrobial resistance [15].
- All solutions must be diluted according to manufacturer's instructions for maximum effectiveness. Increasing the strength of disinfectants does not increase the antimicrobial activity. Decreasing the strength of disinfectants may lead to antimicrobial resistance.
- Surface disinfectants should be sprayed directly onto surfaces and leave on as directed before being wiped systematically and carefully i.e. the 'contact time' of the disinfectant with the surface must be followed as per manufacturer's recommendation.
- Disinfectant solution should be made up daily and used mainly on hard, non-porous surfaces.
- Disinfectant solutions must be prepared daily to maintain disinfectant strength.
- Disinfectant solutions (as well as detergents) become contaminated during cleaning and therefore less effective when the organic load is too high. Continued use may transfer microorganisms to each subsequent surface [14].
- Discard detergent and/or disinfectant solutions after each use, particularly in areas with suspected/confirmed COVID-19 cases [14].
- Disinfectant containers (buckets) must be cleaned daily after use.
- Disinfectant containers should be washed with detergent, rinsed, dried and stored inverted to drain fully when not in use [16].
- Store and use disinfectants in a responsible and appropriate manner according to the label.

4.3. Approved disinfectants for COVID-19

- SARS-CoV-2 is an enveloped virus with a fragile outer lipid envelope and is therefore inactivated by many common household disinfectants [14].
- Use disinfectants registered with the National Regulator for Compulsory Specifications (NRCS; Appendix A).
- Appendix B lists the active ingredients recommended by the Department of Trade and Industry.
- If approved/registered disinfectants are not available, then the following is recommended:
    - 70 - 90% ethyl alcohol (ethanol) to disinfect small areas and between uses of reusable equipment [8], [14].
    - Chlorine-based solution (e.g. calcium/sodium hypochlorite also known as bleach or jik):
        - 0.1% (1000 ppm) for general environmental disinfection [14].
        - 0.5% (5000 ppm) for disinfecting larger spaces [8].
        - 0.5% for vomit, blood or other bodily fluid spillages [8], [14].
- Hydrogen peroxide ≥ 0.5% [14].
- The contact time for ethanol, chlorine-based solutions and hydrogen peroxide to ensure inactivation of SARS-CoV-2 is 1 minute [14].

4.4. Frequency for cleaning and disinfection in the workplace

- It is recommended that workplaces are cleaned at least daily [17].
- The frequency of cleaning will increase due to the following factors:
    - If the workplace operates in shifts, workplaces should be cleaned between shifts.
    - If equipment is shared between workers, it should be cleaned between uses.
- When and how often the workplace, or certain surfaces, should be disinfected will depend on the likelihood of contaminated material being present, for example:
    - Any time there has been a case or suspected case of COVID-19 at the workplace.
    - At workplaces with a high volume of workers, customers or visitors that are likely to touch surfaces [17].

- The frequency and methods for cleaning and disinfection during routine cleaning and following a suspected/confirmed COVID-19 case of materials and items encountered at the workplace is available in Table 1 and Table 2, Appendix C.
- Cleaning and disinfection of public transportation (i.e. company vehicles) to be done daily and frequently, at the start of every shift, during breaks (i.e. after every trip) and at the end of each shift [8] (see Table 2, Appendix C).

4.5. Cleaning and disinfection of hard (non-porous) surfaces

- Dirty surfaces should be cleaned using a detergent or soap and water prior to disinfection.
- Use a suitable product for the type of surface to be cleaned. See Table 1, Appendix C for suitable cleaning and disinfection methods based on surface type.
- Follow the instructions on the label (e.g. contact time, concentration, volume and protective measures) to ensure safe and effective use of the disinfectant.
- Check to ensure the product is not past its expiration date.
- Unexpired household chlorine-based solutions (bleach) will be effective against coronaviruses when properly diluted.
- Never mix chlorine-based solutions (bleach) with ammonia or any other cleanser as dangerous gases may be released.
- Chlorine-based solutions (bleach) solutions will be effective for disinfection up to 24 hours.

4.6. Cleaning and disinfection of soft (porous) surfaces

- Remove visible contamination if present and clean using soap and water or with appropriate cleaners indicated for use on these surfaces.
- Clean items (if possible) according to the manufacturer's instructions. Use the warmest appropriate water setting and dry items completely. Refer to Appendix A for NRCS-approved disinfectants suitable for soft porous surfaces [11].

4.7. Cleaning and disinfection of laundry

- Do not shake dirty laundry in order to minimize the possibility of dispersing virus through the air.
- Launder items according to the manufacturer's instructions.

- Use the warmest appropriate water setting and dry items completely.
- Dirty laundry from an ill person can be washed with other people's items.[11]
- Clean and disinfect plastic clothes hampers according to the guidance above for hard, non-porous surfaces (Section 4.5) [6] or fabric clothes hampers according to the guidance above for soft (porous) surfaces (Section 4.6).

4.8. Cleaning and disinfection of electronics

- Consider putting a wipeable cover on electronics.
- Follow manufacturer's instruction for cleaning and disinfecting.
- If no guidance, use alcohol-based wipes or a household spray bottle containing at least 70% alcohol. Dry surface thoroughly [11].

4.9. Cleaning of minimally-touched surfaces

- Detergent solution/wipes should be used as per manufacturer's instructions.
- Damp mopping is preferable to dry mopping.
- The frequency of routine cleaning of minimally-touched surfaces e.g. walls, blinds, ceilings etc. is specified in Table 2, Appendix C.

4.10. Cleaning and disinfection of highly-touched surfaces

- Highly-touched areas should be cleaned and disinfected according to the frequencies specified in Table 2, Appendix C.
- Clean general surfaces and fittings immediately when visibly soiled.
- Routine cleaning and disinfection should be done with clean water and a neutral detergent.
- Detergent-impregnated wipes may be used but should not be used as a replacement for the mechanical cleaning process [8].

5. Deep cleaning when COVID-19 positive cases have been identified

It is unknown how long the air inside a room occupied by someone with confirmed COVID-19 remains potentially infectious. Facilities will need to consider factors such as the size of the room and the ventilation system design including flowrate as well as location of air supply and exhaust vents when deciding how long to close off rooms or areas used by ill persons before beginning disinfection. Taking measures to improve ventilation in an area or room where

someone was ill or suspected to be ill with COVID-19 will help shorten the time it takes respiratory droplets to be removed from the air [11].

This section of the document provides recommendations on the cleaning and disinfection of rooms or areas after a confirmed COVID-19 case has been removed from the workplace setting. It is aimed at limiting the survival of SARS-CoV-2 in key environments [11].

5.1. Deep cleaning by fogging

Fogging or spraying of a workplace after a COVID-19 positive case has been identified should only be conducted by a reputable specialist deep cleaning service provider with the relevant skills and expertise and not a general cleaner, laboratory-based cleaner or staff member. If required, a cleaner (laboratory-based or general) should receive formal training on how to conduct deep cleaning and must be deemed competent prior to conducting deep cleaning of the workplace.

It should be noted however that the WHO [14], United Nations [18], EPA [18] and CDC [19], [20] does not recommend deep cleaning by fogging of workplace settings for COVID-19:

- Simply fogging an area with a disinfectant does not meet EPA-registered label requirements without proper pre-cleaning as disinfectants are easily inactivated by organic matter [21].
- Fogging may miss surfaces shielded by objects/folded fabric etc. [14]
- Fogging of a disinfectant may change its safety (or toxicological profile) and effectiveness [20].
- Fogging increases the inhalation exposure to workers and community [14].

These governmental institutions therefore recommend ‘deep cleaning by wiping’ i.e. applying disinfectant with cloth or wipe after thorough cleaning [14]. Furthermore, ‘deep cleaning by wiping’ ensures maximum contact with the virus, which will lead to the greatest risk reduction [21].

5.2. Deep cleaning by wiping

Deep cleaning by wiping has proven to be successful for COVID-19 and is recommended in both heath care settings [10], [22] and non-healthcare settings, is easier to conduct compared

to fogging and can therefore be carried out by a general or laboratory-based cleaner, provided that suitable PPE is made available by the employer (see Section 6).

The following steps are to be followed for a general workplace area after a suspected/confirmed COVID-19 case has been removed:

- Close off areas visited by the ill persons.
- Companies do not need to close operations if they can successfully close off affected areas. Work may be directed to another clean facility in the interim.
- Open outside doors and windows and use ventilating fans to increase air circulation.
- Wait 24 hours or as long as practical before beginning 'deep cleaning by wiping'.
- Clean and disinfect all communal, laboratory-based areas and shared electronic equipment used by the ill persons, focusing especially on high-touched surfaces [6].
- Refer to Tables 1 and 2 in Appendix C for cleaning and disinfection methods of common surfaces and items encountered in the workplace following suspected/confirmed COVID-19 case.
- Most surfaces may be wiped down and washed at least twice, with 0.05% (500 ppm %) chlorine-based solution [8] or once with 0.1% chlorine-based solution [14].
- Avoid exposure to contaminated items from the ill person's work environment (pens, computers, eating utensils, dishes) [8].
- Vomit, blood or other spillage should be flooded with 0.5% chlorine-based solution , covered with paper towels or absorbent material and left for at least 30 minutes before cleaning [8].
- Cleaning equipment (e.g. buckets) should be well maintained. Equipment used for isolation areas for patients with COVID-19 should be colour-coded and separated from other equipment [14].
- If more than 7 days have elapsed since the ill person visited or used the facility, additional cleaning and disinfection is not necessary [12].
- Continue routine cleaning and disinfection. This includes everyday practices that businesses and communities normally use to maintain a healthy environment [12].

6. PPE and hand disinfection during cleaning and disinfection

- A critical step in the risk assessment of exposure to a hazardous biological agents is to identify the most suitable control measures (as far as reasonably practical), which include engineering controls, administrative controls and PPE [23], [24].
- The points below specifically addresses the PPE required for general and laboratory-based cleaners during routine cleaning as well as the PPE required for deep cleaning.
- For proper use of PPE refer to the following NIOH video: https://www.youtube.com/watch?v=zN5y1u44RZU&t=40s
- For routine cleaning of small work spaces the following PPE is required [8]:
    - Disposable or utility gloves
    - Plastic aprons
    - Closed shoes [14]
    - A suitable respirator to mask smell/vapours of disinfectants [8], subject to a risk assessment assessing chemical and biological hazards.
- The CDC recommends that gowns should be worn during routine cleaning. However, if gowns are not available then coveralls, aprons (as recommended by the DoH) or work uniforms can be worn during cleaning and disinfecting. Washable clothing should be laundered afterwards.
- PPE should be compatible with the disinfectant products being used.
- Additional PPE might be required based on the cleaning/disinfectant products being used and whether there is a risk of splash.
- Gloves should be removed after cleaning a room or area occupied by ill persons.
- PPE should be removed carefully to avoid contamination of the wearer and the surrounding area.
- For deep cleaning of larger work spaces the following PPE is required [8]:
    - Full-length overall
    - Head-covering
    - Plastic apron
    - Goggles
    - PVC gloves
    - PVC boots
    - A suitable respirator to mask smell/vapours of disinfectants
- Wear appropriate PPE for all tasks in the cleaning process, including handling trash.

- After use, utility gloves should be cleaned with soap and water and decontaminated with 0.5% chlorine-based solution (bleach). Single-use gloves (e.g. nitrile or latex) should be discarded after each use [8].
- Wash hands often with soap and water for 20 seconds (NIOH hand wash video https://www.youtube.com/watch?v=AlsONBKKO1M).
- Hand sanitizer: If soap and water are not available and hands are not visibly dirty, an alcohol-based hand sanitizer that contains at least 70% alcohol may be used [25] (NIOH hand sanitize videos: https://www.youtube.com/watch?v=W73Qmimbcjg; https://www.youtube.com/watch?v=B2Q3_41Zy0w; https://www.youtube.com/watch?v=2EyUpWwoLv4). However, if hands are visibly dirty, always wash hands with soap and water first before disinfecting.
- If an alcohol-based hand rub and soap are not available, then using chlorinated water (0.05%) for handwashing is an option, but it is not ideal because frequent use may lead to dermatitis, which could increase the risk of infection and asthma and because prepared dilutions might be inaccurate [1].
- Key times to wash hands include:
    - After blowing one's nose, coughing, or sneezing.
    - After using the toilet.
    - Before eating or preparing food.
    - After contact with animals or pets.
    - Before and after providing routine care for another person who needs assistance (e.g., a child).
    - After handling dirty laundry
    - Before putting on (don) PPE
    - After removing (doff) PPE
    - When changing gloves
    - After any contact with a patient with suspected or confirmed COVID-19 infection or patient waste
    - After contact with any respiratory secretions [1]

7. Advances in cleaning

Employers should note recent advances in safe cleaning practices and the availability of modern cleaning equipment that minimizes the use of chemicals. Practices and equipment to consider include:

- Walk-off mats placed inside and outside of entryways (to prevent dirt from being tracked into the building);
- Microfiber mops, cloths and dusters;
- Vacuum cleaning equipment with a high filtration efficiency (HEPA)
- Walk-behind hard floor auto-scrubbers;
- Hands-free mops;
- Chemical free cleaning systems [9].

Note that consideration of the abovementioned list should include suitability and availability in light of the current COVID-19 pandemic.

8. Worker education

- Staff, including management, must be trained in the effective cleaning processes, appropriate equipment and use of detergents and disinfectants and proper cleaning methods for various areas in a facility, including infection prevention and control [8].
- For management roles and responsibilities refer to the following link: https://www.youtube.com/watch?v=uJhVJrKWdtk
- Develop policies for worker protection and provide training to all cleaning staff on site prior to providing cleaning tasks.
    - Training should include when to use PPE, what PPE is necessary, how to properly don, use, and doff PPE, and how to properly dispose of PPE.
- Records of cleaning staff training must be kept and be available for inspection [8].
- Employers must obtain and maintain Safety Data Sheets (SDSs) for all hazardous cleaning products and chemicals that they use. SDSs must be readily accessible to workers [9]. Employers can use the information contained in the SDSs to ensure that workers are properly protected. SDSs include the following important information [26]:
    - Product and Company Identification
    - Composition
    - Hazards Identification

- First-aid Measures
- Fire-fighting Measures
- Accidental Release Measures
- Handling and Storage
- Exposure Control/Personal Protection
- Physical and Chemical Properties
- Stability and Reactivity
- Toxicological Information
- Ecological Information
- Disposal Considerations
- Transport Information
- Regulatory Information
- Other Information

- When cleaning chemicals are hazardous, employers must train workers on safe work practices for using these chemicals. Safe work practices when using cleaning chemicals include the following [9]:
  - Warning workers[9] not to mix cleaning products that contain sodium/calcium hypochlorite (bleach) and ammonia;
  - Making sure that workers know which cleaning chemicals must be diluted and how to correctly dilute the detergents/disinfectants they are using;
  - Thoroughly reviewing and training workers on the use, storage and emergency spill procedures for cleaning chemicals;
  - Reviewing the proper PPE needed, such as gloves and goggles, and providing PPE to the workers using the cleaning product;
  - Ensuring that all containers of cleaning products and chemicals are labelled to identify their contents and hazards;
  - Operating ventilation systems as needed during cleaning tasks to allow sufficient air flow and to prevent build-up of hazardous vapours;
  - Providing workers with a place to wash up after using cleaning chemicals.
  - Cleaning chemicals should not be used to wash hands. Wash hands with water after working with a cleaning chemical, especially before eating, drinking or smoking.

[9] General and laboratory-based cleaner

    - Employers must provide training to workers at a level and in a language and vocabulary that they can understand [9].
- No eating, drinking, or smoking is allowed except in specific designated areas.
- Educate workers performing cleaning, laundry, and general waste pick-up to recognize the symptoms of COVID-19.
- Workers should immediately report breaches in PPE such as a tear in gloves or any other potential exposures to their supervisor.

9. Important measures for workplaces

- Placing sanitizing hand rub dispensers at entry points around the workplace, and make sure these dispensers are regularly refilled;
- Making sure that staff, contractors and customers have access to hand washing facilities with soap and clean water.
- Promoting hand-washing by employees, contractors and customers as explained under 'key times to wash hands' (in Section 6).
- Briefing employees, contractors and customers that if COVID-19 starts spreading in their community, anyone with even a mild cough or low-grade fever (37.3 °C or more) needs to stay at home. They should also stay home (or work from home) if they have had to take simple medications, such a paracetamol/acetaminophen, ibuprofen or aspirin, which may mask symptoms of infection.
- Utilizing other communication measures such as offering guidance from occupational health and safety officers, briefings at meetings and information on the internet to promote hand-washing (see Section 7 for hand-wash videos) and provide additional general information on COVID-19.
- Display posters promoting hand-washing and sanitization, which can be accessed at http://www.nioh.ac.za/wp-content/uploads/2020/03/Handwashing-poster-1.pdf and http://www.nioh.ac.za/wp-content/uploads/2020/03/Hand-Sanitiser-Poster_v1.pdf.
- Promote good respiratory hygiene in the workplace, and display posters promoting respiratory hygiene.
- Ensure that paper tissues are available at your workplaces, for those who develop a runny nose or dry cough at work, along with closed bins for hygienically disposing of them because good respiratory hygiene prevents the spread of COVID-19.

10. Generation of waste in workplaces/offices and public places

- All waste generated from offices and public places including masks, gloves, paper towels, etc. should be treated as health care general waste as per SANS 10248-1:2008.
- The waste must be placed in clear or black plastic rubbish bags and tied when full.
- These plastic rubbish bags may be placed with the normal waste generated for collection, removal, transportation and disposal by the local municipality.
- If health-screening measures are exercised at work places/offices, all waste generated should be treated as health care risk waste as per SANS 10248-1:2008 and disposed of accordingly.
- Proper hand hygiene practices must be performed/observed during and after the removal of the waste [8].

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Appendix

A. List of Registered Disinfectants by the NRCS

https://www.nrcs.org.za/siteimgs/CMM/LOA/Disinfectant/Registration%20Database%20Chemical%20Disinfectants%202009-2020.pdf

B. List of Active Ingredients used in Chemical Disinfectant Formulations [27]

D.1 This list provided below is non-exhaustive but is provided for use as a guideline.

D.2 The active ingredient may be formulated in combination with other compatible actives.

1. Quaternary Ammonium Compounds (QACs)

- alkyltrimethyl ammonium bromide
- dialkyldimethyl ammonium chloride
- domiphen bromide

- benzethonium chloride
- cetylpyridinium chloride
- alkyl (dichlorophenyl)methyldimethyl chloride
- polymeric quaternary ammonium compound

2. Phenols (Clear soluble, white and black fluid) and chlorinated phenols

- Phenol
- Cresol
- Xylenol
- Ethyiphenol
- Phenylphenol
- Chlorometaxylenol
- Dichlorometaxylenol
- Chloro-o-phenylphenol
- Benzylchlorophenol
- Benzylchlorophenol
- Parachlorometaxylenol

3. Halogen- releasing compounds

- Sodium hypochlorite
- Potassium hypochlorite
- Lithium hypochlorite
- Calcium hypochlorite
- Trichloroisocyanuric acid
- Sodium dichloroisocyanurate
- Dichlorod imethyihydantoin
- Chloramine -T,
- Halozone,
- N- chlorosuccinimide
- Chlorinated trisodium phosphate
- Chlorine dioxide
- Bromine releasing products
    - Bromochlorodimethylhydantoin
    - Sodium bromide

4. Aldehydes

- Formaldehyde
- Glutaraldehyde
- Glyoxaldehyde
- Glycidaldehyde
- Succindialdeyhyde

5. Biguanides and polymeric biguanides

- Alexidine,
- Chiorhexidine
- Polymeric Biguanides.

6. Amphoterics

- Amphoteric compounds formulated with either anionic or cationic substances.

7. Iodine-based compounds

- Iodophors stabilised with either acids or acidic buffers

8. Alcohols

- Ethyl alcohol
- Isopropyl alcohol
- M- propyl alcohol
- Terpene alcohols
- Phenoxyethanol
- Phenylethyl alcohol

9. Acids

- Organic acids e.g. formic, citric, lactic, mallic, glutaric and propionic acids
- Inorganic acids e.g. nitric, hydrochloric, sulphuric, phosphoric and suiphamic acids

10. Peroxygen -based compounds

- Hydrogen peroxide
- Peracetic acid
- Sodium and potassium monopersulphates
- Sodium metaperiodate

11. Alkalis

- Sodium and potassium hydroxide
- Quicklime (calcium oxide)
- Sodium carbonate

- sodium metasilicate

C. Frequency and methods for cleaning and disinfection of common materials (Table 1) and items (Table 2) encountered at the workplace. Modified from Safe Work Australia [17].

Table 1: Common surfaces in the workplace

Material	Routine cleaning			Following suspected/confirmed case	
	Highly-touched surfaces	Minimally-touched surfaces	Method	Highly/Minimally-touched	Method
Soft plastics	Clean at least daily or every shift change	Clean weekly	Damp dust† + Detergent	Clean and disinfect as you become aware	Detergent + Disinfectant
Hard plastics	Clean at least daily or every shift change	Clean weekly	Detergent	Clean and disinfect as you become aware	Detergent + Disinfectant
Metal surfaces(stainless steel, uncoated steel, zinc coated steel, aluminium)	Clean at least daily or every shift change	Clean weekly	Detergent	Clean and disinfect as you become aware	Detergent + Disinfectant* *uncoated steel more susceptible to rust when disinfected. Disinfect only when necessary, and treat for rust as appropriate
Deliberately Greased or Oiled metal surfaces	Clean at least daily or every shift change	Clean weekly	Clean according to manufacturer Recommendations	Clean and disinfect as you become aware	Clean according to manufacturer recommendations
Wood	Clean at least daily or every shift change	Clean weekly	Damp dust† + Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Laminate	Clean at least daily or every shift change	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Glass	Clean at least daily or every shift change	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Concrete (polished)	Clean at least daily or every shift change	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Concrete (rough)	Clean at least daily or every shift change	Clean weekly	Vacuum (HEPA) or Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Leather	Clean at least daily or every shift change	Clean weekly	Clean according to manufacturer recommendations	Clean and disinfect as soon as you become aware	Clean and disinfect according to manufacturer recommendations
Fabric	Clean at least daily or every shift change	Clean weekly	Vacuum (HEPA) Damp dust† + Detergent If launderable,	Clean and disinfect as soon as you become aware	Detergent + Steam clean. If launderable, wash on warmest possible setting according to manufacturer

Material	Routine cleaning			Following suspected/confirmed case	
	Highly-touched surfaces	Minimally-touched surfaces	Method	Highly/Minimally-touched	Method
			wash on warmest possible setting according to manufacturer recommendations with laundry detergent		recommendations with laundry detergent
Paper	Not suitable for cleaning	Not suitable for cleaning	Use alternate, cleanable options, such as electronic tablets. If use is un-avoidable, and individual use is not feasible, use a plastic protective sheet over page.	Not suitable for cleaning. Leave undisturbed for a minimum of 72 hours.	Dispose of in the bin (double-bagged), or leave undisturbed for a minimum of 72 hours, longer if possible.

† Damp dust: Wet a cloth with detergent and wring out, such that the cloth remains damp, but does not drip water.

Table 2: Common items in the workplace

Item	Routine cleaning			Following suspected/confirmed case	
	Highly-touched surfaces	Minimally-touched Surfaces	Method	Highly/Minimally-touched	Method
Office access points					
Alcohol-based hand sanitiser dispenser	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Cleaning equipment					
Cleaning Equipment (e.g. buckets)	Clean after use	Clean after use	Detergent	Clean after use	Detergent + Disinfectant
Office environment					
Floor (non-slip vinyl)	Damp mop daily	Damp mop daily	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Floor (polished concrete)	Dust removal & clean daily	Dust removal & clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Carpet (Soft Floor)	Clean daily	Clean weekly	Vacuum with HEPA filter	Clean and disinfect as soon as you become aware	Carpet shampoo + Steam clean

Item	Routine cleaning			Following suspected/confirmed case	
	Highly-touched surfaces	Minimally-touched Surfaces	Method	Highly/Minimally-touched	Method
	Clean annually	Clean annually	Shampoo or steam clean		
Ceiling	Spot clean daily & wash yearly, e.g. access hatches and surrounds	Spot clean weekly & wash every 3 years	Damp dust† + Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Curtains and Blinds	Clean weekly	Clean monthly	Refer to manufacturer recommendations. Steam clean curtains or blinds in place or machine wash curtains according to manufacturer recommendations	Clean and disinfect as soon as you become aware	Damp dust† + Detergent Steam clean curtains or blinds
Walls	Spot clean touched walls daily & full clean yearly	Spot clean weekly & full clean yearly	Damp dust† + Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Windows	Spot clean touched windows daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Window frames (sliding servery window types)	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Light and Power point Switches	Clean at least daily	Clean weekly	Damp dust† + Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant Damp dust†
Lights/lighting	Clean daily	Clean weekly	Refer to manufacturer recommendations. Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Push/pull doors (with and without a push plate)	Clean at least daily	Clean weekly	Detergent + Disinfectant	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Door frames	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Door knob/handles	Clean at least daily	Clean daily	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Call bell/door bell	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Elevator buttons	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Hand rails, stair rails	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Shelves (and items on shelves)	Clean weekly	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Tables/desks	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant

Item	Routine cleaning			Following suspected/confirmed case	
	Highly-touched surfaces	Minimally-touched Surfaces	Method	Highly/Minimally-touched	Method
Chairs (non-upholstered) e.g. plastic chairs, wooden chairs, other non-padded chairs	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Chairs (upholstered) e.g. fabric padded chairs, sofas, office chairs	Clean at least daily	Clean weekly	Vacuum (HEPA) Damp dust† + Detergent	Clean and disinfect as soon as you become aware	Detergent + Steam clean
Clipboard / Folders	Clean after use	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Keys and locks and padlocks	Clean daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Remote controls	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Telephone	Clean at least daily & more regularly if shared by multiple users	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant Damp dust†
Office electronics					
Electrical equipment	Clean at least daily or between users if shared	Clean weekly	Refer to the manufacturer recommendations	Clean and disinfect as soon as you Become aware	Detergent + Disinfectant
Electronic equipment (sensitive to electrostatic charge) E.g. Ipads, tablets, laptops exterior of computer case and monitors	Clean at least daily or between users if shared	Clean weekly	Consider adding a wipeable cover to the device/screen. Refer to manufacturer recommendations. If no recommendations, use isopropyl alcohol-based solution with non-electrostatic wipes suitable for electronic equipment	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Touch screens e.g. information screens in buildings	Clean at least daily	Clean weekly	Consider adding a wipeable cover to the device/screen. Refer to manufacturer recommendations. Isopropyl alcohol-based wipes/sprays	Clean and disinfect as soon as you become aware	Detergent + Disinfectant on wipeable covers. Isopropyl alcohol-based wipes/sprays

Item	Routine cleaning			Following suspected/confirmed case	
	Highly-touched surfaces	Minimally-touched Surfaces	Method	Highly/Minimally-touched	Method
Computer, Keyboard, Mouse Headsets	Clean at least daily or when visibly soiled, and between users if equipment is shared	Clean weekly or when visibly soiled	Consider adding a wipeable cover to the device/screen. Refer to manufacturer recommendations. Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant on wipeable cover, or isopropyl alcohol-based wipes/sprays
Kitchen					
Kitchen appliances (toasters, kettles, sandwich presses, jaffle makers, ovens)	Clean at least daily	Clean weekly	Refer to manufacturer recommendations Isopropyl alcohol-based wipes/sprays Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Fridges	Weekly, & defrost to clean as required Clean frequently touched surfaces on fridge (i.e. handles) at least daily	Monthly & defrost as required Daily spot check- clean when necessary	Refer to manufacturer recommendations. Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Microwave	Clean Frequently touched points on microwave at least daily	Clean daily	Refer to manufacturer recommendations. Detergent	Clean and disinfect as soon as you become aware	Detergent. Disinfectant on outside surfaces only.
Sink (hand washing & kitchen)	Clean at least daily	Clean daily	Detergent	Clean and disinfect as soon as you become aware	Detergent Disinfectant on areas around sink only, not in sink
Bathroom					
Toilet	Clean at least daily	Clean weekly	Detergent + disinfectant	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Toilet doors and locks	Clean at least daily	Clean weekly	Detergent + Disinfectant	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Transport					
Door Handles	Clean at least daily	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Gear knobs	Clean at least daily or between users if shared	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Seat Belts	Clean at least daily or between users if shared	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Steering wheels	Clean at least between shifts or between users	Clean weekly	Detergent	Clean and disinfect as soon as you become aware	Detergent + Disinfectant
Switches and other controls	Clean at least daily	Clean weekly	Isopropyl alcohol- based wipes/sprays	Clean and disinfect as soon as you become aware	Isopropyl alcohol-based wipes/sprays

[†] Damp dust: Wet a cloth with detergent and wring out, such that the cloth remains damp, but does not drip water.