SANITIZATION OF PUBLIC PLACES IN COVID19 ERA: A COMPARISON OF INDIAN AND AMERICAN MUNICIPAL PRACTICES

ABSTRACT
Aims: The workers aim to review disinfection practices in public places in India and USA

Main text: Sanitization of Public Places in India: One percent sodium hypochlorite or phenolic disinfectants must be used for mopping of all indoor areas such as entrance lobbies, corridors and staircases, escalators, elevators, security guard booths, office rooms, meeting rooms, cafeteria. Frequently touched surfaces should be cleaned twice daily by mopping with a linen/absorbable cloth soaked in 1% sodium hypochlorite. Sanitization of Public Places in USA: Surfaces and objects which are not frequently touched should be cleaned as a routine. They do not require additional disinfection. Gloves and PPE appropriate for the chemicals being used must be worn by the workers for routine cleaning and disinfecting. Notwithstanding Government and WHO guidelines, there are media reports of use of disinfection tunnels in various public places in India.

Appropriate disinfectants against SARS-CoV-2: EPA’s registered antimicrobial products are expected to be effective against SARS-CoV-2 based on data for viruses which are harder to kill.

Conclusion: Disinfection for the SARS-CoV-2 is quite similar to disinfection which is carried out for other viruses, like the flu or a common cold.

.KEYWORDS
SARS-CoV-2, Disinfection, Public places, Municipal practices

BACKGROUND:
A new respiratory infectious disease, COVID-19, caused by a new coronavirus called SARS-CoV-2, emerged in early December 2019. Since then, the virus has spread to India and 106 other countries in Asia, Europe, North America, Africa, and Oceania. On March 11, the World Health Organization (WHO) declared the outbreak a pandemic, which has since rapidly evolved. As an economic hub with substantial global connectivity and movement of people and goods, India is directly impacted by the COVID-19 pandemic.

The mode of transmission of the SARS-CoV-2 has mandated use of various non pharmacological interventions such as use of mask, social distancing, cough etiquettes, hand hygiene. It has also mandated, disinfection campaigns for disinfection of commonly touched surfaces/objects, besides control of international, interstate, interdistrict and intercity borders and crossing points, launching of massive public awareness campaigns, quarantine and isolation for its prevention.

Aims
The workers aim to review disinfection practices in public places in India and USA

Objectives
1. To study disinfection practices in public places which are being followed in India and USA based on available literature on the subject including lay reporting by various media.

Scope of this paper
Various countries all over the world have issued comprehensive guidelines for sanitization/disinfection practices to be carried out in various public places. In this paper the authors propose to compare the sanitization/disinfection practices being carried out public places, in India and USA based on various guidelines issued by the respective governments. Public places include, grocery stores, vegetable, fruit and non vegetarian food markets, shopping malls, roads, pharmacies, public transport such as buses, trains and aeroplanes, bus depots, railway stations, airports, workplaces offices both government as well as private, businesses, religious places, schools and other educational institutions, besides hospitals, gymnasiums, swimming pools, club houses, sports stadia and public toilets to name a few.

However, for the sake of brevity the workers propose to study the sanitization/disinfection practices carried out indoors in grocery stores, shopping malls, and workplaces, public toilets and roads in India and USA.

Main text
Sanitization of Public Places in India
Indoor areas including grocery stores, shopping malls and office spaces
Ministry of Health & family Welfare Office, Government Of India has issued comprehensive guidelines on sanitization in common public places. A few salient points of the above guideline are highlighted below:

(a) Cleaning of office spaces including conference rooms should be carried out early in the morning or after office hours. The worker must use disposable rubber boots, gloves (heavy duty), and a triple layer mask while doing the cleaning.
(b) Cleaning must start from cleaner areas and proceed towards dirtier areas.
(c) One percent sodium hypochlorite or phenolic disinfectants must be used for mopping of all indoor areas such as entrance lobbies, corridors and staircases, escalators, elevators, security guard booths, office rooms, meeting rooms, cafeteria.
(d) Frequently touched surfaces such as elevator buttons, handrails/handles and call buttons, escalator handrails, public counters, intercom systems, equipment like telephone, printers/scanners, and other office machines should be cleaned twice daily by mopping with a linen/absorbable cloth soaked in 1% sodium hypochlorite. Special attention should also be paid to frequently touched areas like table tops, chair handles, pens, diary files, keyboards, mouse, mouse pad, tea/coffee dispensing machines etc.
(e) For metallic surfaces such as door handles, security locks, keys etc, where the use of sodium hypochlorite is not suitable, 70%
alcohol can be used to wipe down these surfaces.
(f) Hand sanitizing stations should be installed in office premises (especially at the entry) and near high contact surfaces.

Public toilets
As per MOHFW, Govt of India guidelines, separate set of cleaning equipment (mops, nylon scrubber) must be used for toilets and separate set for sink and commode. While cleaning a toilet, sanitary workers must always wear disposable protective gloves. Details of disinfectant and equipment to be utilised; and procedure to be followed for sanitization of toilets are presented in Table 1.

Guidelines for preparation of 1% sodium hypochlorite solution are tabulated in Table 2.

Table 1: Details of disinfectant and equipment to be utilised; and procedure to be followed for sanitization of toilets

<table>
<thead>
<tr>
<th>Areas</th>
<th>Agents / Toilet cleaner</th>
<th>Procedure</th>
</tr>
</thead>
</table>
| Toilet pot/commode     | Sodium hypochlorite 1% / detergent soap powder / long handle angular brush | • Inside of toilet pot/commode:  
  • Scrub with the recommended agents and the long handle angular brush.  
  • Outside: clean with recommended agents; use a scrubber. |
| Lid/commode            | Nylon scrubber and soap powder/detergent 1% Sodium Hypochlorite | • Wet and scrub with soap powder and the nylon scrubber inside and outside:  
  • Wipe with 1% Sodium Hypochlorite |
| Toilet floor           | Soap powder / detergent and scrubbing brush / nylon broom 1% Sodium Hypochlorite | • Scrub floor with soap powder and the scrubbing brush:  
  • Wash with water  
  • Use sodium hypochlorite 1% dilution |
| Sink                   | Soap powder / detergent and nylon scrubber 1% Sodium Hypochlorite | • Scrub with the nylon scrubber.  
  • Wipe with 1% sodium hypochlorite |
| Showers area / Taps and fittings | Detergent powder and soap powder or sprayer 1% Sodium Hypochlorite | Thoroughly scrub the floors/tiles with warm water and detergent:  
  • Wipe over taps and fittings with a damp cloth and detergent.  
  • Care should be taken to clean the underside of taps and fittings.  
  • Wipe with 1% sodium hypochlorite/70% alcohol |
| Soap dispensers        | Detergent and water                      | Should be cleaned daily with detergent and water and dried. |

Table 2: Guidelines for preparation of 1% sodium hypochlorite solution

<table>
<thead>
<tr>
<th>Product</th>
<th>Available chlorine</th>
<th>1 percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium hypochlorite – liquid bleach</td>
<td>3.5%</td>
<td>1 part bleach to 2.5 parts water</td>
</tr>
<tr>
<td>Sodium hypochlorite – liquid</td>
<td>5%</td>
<td>1 part bleach to 4 parts water</td>
</tr>
<tr>
<td>NaDCC (sodium dichloroisocyanurate) powder</td>
<td>60%</td>
<td>17 grams to 1 litre water</td>
</tr>
<tr>
<td>NaDCC (1.5 g / tablet) – tablets</td>
<td>60%</td>
<td>11 tablets to 1 litre water</td>
</tr>
<tr>
<td>Chloramine – powder</td>
<td>25%</td>
<td>80 g to 1 litre water</td>
</tr>
<tr>
<td>Bleaching powder</td>
<td>70%</td>
<td>7 g to 1 litre water</td>
</tr>
</tbody>
</table>

Outdoor areas including roads
Outdoor areas including bus stops, railway platforms, parks, roads, etc, have less risk as compared to indoor areas due to air currents and exposure to sunlight. Cleaning and disinfection efforts should be targeted to frequently touched/contaminated surfaces akin to that carried out for indoor areas/workplaces.

Sanitization of Public Places in USA
Indoor areas including grocery stores, shopping malls and office spaces
CDC, Atlanta has issued comprehensive guidelines for all Americans, whether they own a business, or school.

A few salient points of these guidelines are highlighted below:
(a) Surfaces and objects which are not frequently touched should be cleaned as a routine. They do not require additional disinfection. Routine cleaning and disinfecting forms a very important part of reducing the risk of exposure to SARS-CoV-2. Routine cleaning with soap and water alone is a prerequisite before disinfection of dirty surfaces; and can reduce risk of exposure.
(b) Gloves and PPE appropriate for the chemicals being used must be worn by the workers for routine cleaning and disinfecting. The directions given on the label of the disinfectant ought to be followed. In specific instances, personnel with specialized training and equipment may be required to apply certain disinfectants such as fumigants or fogs. The workers must wash their hands thoroughly with soap and water after cleaning.
(c) Soft and porous materials like seating in an office or coffee shop, area rugs, and carpets, should be laundered strictly according to the manufacturer’s instructions, using the warmest temperature setting possible. Subsequently, the items should be dried completely.
(d) When applied according to the manufacturer’s label, EPA (Environmental Protection Agency) approved disinfectants, are effective for use against SARS-CoV-2. The instructions on the label for all cleaning and disinfection products for concentration, dilution, application method, contact time and any other special considerations such as using gloves and PPE when applying must be strictly followed. This will ensure safe and effective use of the product.

Outdoor areas including roads
Generally normal routine cleaning suffices for outdoor areas; and they do not require disinfection. Existing cleaning and hygiene practices for outdoor areas should be continued. Disinfectants can be effectively, efficiently and safely used on outdoor hard surfaces and objects frequently touched by multiple people.

Disinfection tunnels and other means of disinfection
Government and WHO guidelines do exist advising against spraying of disinfectants on individuals and creation of disinfection tunnels.

Notwithstanding the above guidelines, there are media reports of use of disinfection tunnels in various public places in India. In one instance disinfection tunnel was being used at Tirupati Temple, in India using an Ayurvedic disinfectant. Since the temple was closed due to the COVID19 pandemic, the temple staff were using the disinfectant tunnel. In another instance, a disinfectant tunnel was installed at the office of DGP, Telangana. This tunnel has since been removed.

Disinfectant tunnels are becoming one of the most in-demand commodities in the COVID19 world with malls, offices, banks, and shops lining up to install the structure at their entrances.

In Bangalore, Karnataka the Bruhat Bengaluru Mahanagara Palike (BBMP) undertook a massive sanitisation drive in central parts of the city. Drones were hired to spray disinfectants at places where COVID-19 positive cases were reported in the city. Sodium hypochlorite solution was used for the purpose. Disinfection was also carried out by carrying disinfectant solution on tractors, fitted with jetting machines with each vehicle having a capacity of 7,000 litres.
The BrihanMumbai Electric Supply and Transport (BEST) Undertaking, Navi Mumbai Municipal Transport (NMMT) and Maharashtra State Road Transport Corporation (MSRTC) began disinfecting their vehicles and their respective depots. Special care was being taken in disinfecting door handles, grab handles, windows, latches, seat cushions and head rests. Air conditioned buses were sprayed three times a day, while other buses were sprayed twice a day.18

The Karnataka State Road Transport Corporation (KSRTC) also converted old buses ‘sanitizer buses’ to disinfect people in public places. The buses were modified by installing sprinklers at the Central Workshop of KSRTC at a cost of 20,000 each.19

In Pune, the Corporation carried out disinfection hospitals, public transport buses and residential areas within three kilometre radius of a Covid-19 positive case. Sodium hypochlorite was sprayed for carrying out the disinfection.20

A set of mobile chambers to sanitize the full body of Covid19 workers has been designed by Vietnamese experts. The equipment has been fabricated by the National Institute of Occupational and Environmental Health and the Hanoi University of Science and Technology. One of the dual chambers in the system, spray disinfectant through a row of nozzles, while the other chamber directs heat and ozone onto the body of the person.21

In Indonesia's hand-washing stations and disinfectant-spraying booths have been installed in the capital city of Jakarta. In China drones originally designed to spray pesticides for agricultural applications were repurposed for spraying disinfecting chemicals in some public spaces and also on epidemic prevention vehicles which were travelling between the affected areas.22

In the western part of the planet, the Mexican border city of Nogales, Sonora, has set up “sanitizing tunnels” to disinfect people leaving the US through Nogales, Arizona. The cleansing solution has been said to be biodegradable “biozone”, which protects from “any virus or bacteria, including SARS-CoV-2” for up to 24 hours, in a statement given by the Nogales government. The Mexican border city proposes to install five sanitizing tunnels for the purpose of disinfecting people who arrive through its two main ports of entry from Nogales, Arizona. A sanitizing tunnel is also stationed outside a hospital in Nogales, Sonora, wherein visitors are washed with the disinfectant mist, when they brush open or duck through clear plastic curtains.23

In Spain thousands of litres of disinfecting bleach was sprayed over one mile of beach in the village Zahara de los Atunes.24 Besides, Army specialists donning protective suits sprayed disinfectant in train Stations.25 In Russia jet engines have been converted to massive spray chambers to sanitize the full body of Covid19 workers.26

The Société de Transport de Montréal (STM) increased the frequency of cleaning to more than once a week on buses, paratransit minibuses, trains and stations. The STM also prepared the distribution of disinfectant wipes for all STM agents, train operators and drivers, on both regular and paratransit networks.27

Appropriate disinfectants against SARS-CoV-2

Normal routine cleaning with soap and water will decrease the viral load on various surfaces and objects, thereby reducing the risk of exposure.28 EPA’s registered antimicrobial products are expected to be effective against SARS-CoV-2 based on known viruses which are harder to kill.29 Frequent disinfection of surfaces and objects touched by multiple people is of prime importance. In the instance, when EPA-approved disinfectants are not available, or in short supply, alternative disinfectants can be used (for example, 1/3 cup of bleach added to 1 gallon of water, or 70% alcohol solutions). Bleach or any other cleaning and disinfection products should not be mixed together, as this can cause dangerous fumes.30 If appropriate for the surface, diluted household bleach prepared strictly in accordance with the manufacturer’s instructions can be used. Alcohol solutions with at least 70% alcohol can also be used as disinfectants.31

Coronaviruses on surfaces and objects naturally die within hours to days. Warmer temperatures and exposure to sunlight will reduce the titer of virus particles on surfaces and objects. Normal routine cleaning with soap and water removes germs and dirt from surfaces. It lowers the risk of transmission of SARS-CoV-2. Disinfectants kill germs on surfaces. Killing germs on a surface after cleaning, can further lower the risk of spreading infection. EPA-approved disinfectants are an important part of reducing the risk of exposure to SARS-CoV-2.32 Further details on list of EPA approved disinfectants can be obtained from the website of CDC, Atlanta.33

LIMITATION

A limitation of this study is that, it has taken into account guidelines for disinfection practices which are in vogue as on date. Guidelines may be revised from time to time, as new scientific evidence emerges in this ever changing world; and new knowledge emerges about the SARS-CoV-2.

CONCLUSION

Disinfection for the SARS-CoV-2 is quite similar to disinfection which is carried out for other viruses, like the flu or a common cold. However, various industries are tailoring the cleaning process in keeping with what suits them best. A few common steps have been suggested by public health officials, which can be followed by businesses and individual households alike. These steps include, increasing the frequency of cleanings, using effective disinfectants cleaning "high-touch" spots and making hand sanitizer readily available.34

Specific and comprehensive guidelines exist in India for disinfection of various public places, viz offices, shopping malls, toilets, open areas like roads etc. In USA the guidelines given by the CDC, Atlanta are also comprehensive but more general in nature. The workers have thus reviewed and compared various sanitization practices in public places in India and USA in the era of COVID19. Various disinfection practices advised by the government and various practices being followed as per media reports have also been discussed.

REFERENCES


