Environmental spraying when and where?
Prof S Mehtar - ICAN

Preventing and controlling transmission of COVID 19 infection
How does the SARS-CoV2 virus spread?

The virus is not spread through contaminated feet, wagon wheels, or horse manure. IT SPREADS BY DROPLETS AND CONTACT!
Spraying the environment- when is it useful

High-volume spraying, fogging, or misting is used to advantage where the target is mosquitoes threatens the health of the local population

- Yellow fever
- Dengue
- Zika
- Malaria

The approaches are two-fold:
- (1) larvicidal application to surface water with a very thin oil to eliminate the development of mosquito larvae, and
- (2) adulticide application, where this type of spraying is used on bushes and grassy areas, or (in the case of the four diseases listed), inside houses where the mosquito is found during the day.

This application was considered environmentally damaging, but mosquito eradication programs were effective. It has been banned in most countries
spraying the buildings? Not useful
https://www.nomoredisinfectiontunnels.com/news

BEIJING, March 2 (Xinhua) -- Excessive disinfection should be avoided in China's ongoing fight against the novel coronavirus epidemic, as the effect of disinfection should be prioritized, a health expert said here Monday.

Zhang Liubo, a researcher at the Chinese Center for Disease Control and Prevention, made the remarks at a press conference, saying that methods of large-scale disinfection such as spraying disinfectant with mist cannon trucks and drones are overdone.

A series of guidelines on disinfection techniques have been published amid enhanced popularization of knowledge on disinfection among the public, he continued, citing a circular on the disinfection during the outbreak of COVID-19, which was released Saturday by a working group of the joint prevention and control mechanism of the State Council.

The circular listed a number of conditions where disinfection should be limited, such as no large-scale disinfection outdoors, no outdoor disinfection in rains or snows and no air disinfection outdoors.

It also warned against spraying disinfectant against persons, putting disinfector in ponds, reservoirs or artificial lakes, as well as indoor air disinfection in the presence of someone else.

Applying misted disinfectant to the street, pavement, footpath, is similarly a waste of time, effort and money.
Disinfectant tunnels

Directorate of Health and Family Welfare, Punjab
Purwak Kalyan Bhavan
Sector 31 A, Chandigarh

IDSP/PB/2020/25/06/9

Dated, 13/4/2020, Chandigarh

To
All Deputy Commissioners, Punjab
All Civil Surgeon
Punjab

Subject: Regarding hypochlorite spray tunnels

Regarding above mentioned subject, it is submitted that some districts have set-up hypochlorite spray tunnels for disinfection of people. An advisory issued by WHO states that spraying disinfectants like alcohol or chlorine all over body does not kill the virus rather can be harmful for clothes or mucous membranes. Hypochlorite solution is recommended for disinfection of surfaces and instruments. Moreover, disinfection tunnels will create a false sense of security and people may be diverted from hand wash to disinfection Tunnel.

Under the above circumstances, it is recommended that disinfection tunnels should not be installed and used.

Director Health and Family Welfare, Punjab

IDSP/PB/2020/25/78/9

Dated, 13/4/2020, Chandigarh

Copy:
OSD to Chief Secretary
PA to PSHFW, Punjab
PA to MO, NHM, Punjab
PA to MO, PHSC

Director Health and Family Welfare, Punjab
Using spray of chlorine

• Spraying particularly with chlorine is dangerous and illegal
• Humans should never be sprayed with chlorine

• The evidence......
Deliberate exposure to chlorine spraying—Ebola

Table 2 Chlorine spraying in the three groups

<table>
<thead>
<tr>
<th>Site</th>
<th>HCW</th>
<th>EVD</th>
<th>NEVD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total interviewed</td>
<td>500</td>
<td>550</td>
<td>500</td>
</tr>
<tr>
<td>Not sprayed (excluded)</td>
<td>7</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>Total analysed</td>
<td>N = 493</td>
<td>N = 550</td>
<td>N = 477</td>
</tr>
<tr>
<td>In own house (under quarantine)</td>
<td>9</td>
<td>2</td>
<td>92</td>
</tr>
<tr>
<td>Outside in the community</td>
<td>0</td>
<td>0</td>
<td>21</td>
</tr>
<tr>
<td>Pre transfer</td>
<td>0</td>
<td>162</td>
<td>15</td>
</tr>
<tr>
<td>Back of ambulance</td>
<td>61</td>
<td>547</td>
<td>38</td>
</tr>
<tr>
<td>Leaving ETU</td>
<td>550</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td>Red zone</td>
<td>455</td>
<td>120</td>
<td>22</td>
</tr>
<tr>
<td>Spray others</td>
<td>113</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>In room when spraying others</td>
<td>116</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>EVD case house</td>
<td>16</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>EVD suspect house</td>
<td>33</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

*HCW = healthcare workers; EVD = Ebola virus disease survivors; NEVD = non Ebola cases

Table 5 Adverse events in HCW with single and multiple chlorine exposure compared

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Single Cl₂ exposure (N = 285 n(%))</th>
<th>Multiple Cl₂ exposure (N = 208 n(%))</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye sight problem before</td>
<td>19 (7)</td>
<td>25 (12)</td>
<td>0.04</td>
</tr>
<tr>
<td>Eye sight problem now</td>
<td>95 (34)</td>
<td>123 (59)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Coughing</td>
<td>107 (38)</td>
<td>124 (60)</td>
<td>0.001</td>
</tr>
<tr>
<td>Cough producing sputum</td>
<td>43 (15)</td>
<td>60 (29)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Difficulty in breathing</td>
<td>66 (23)</td>
<td>100 (48)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chest tightness</td>
<td>109 (38)</td>
<td>131 (63)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Burning throat</td>
<td>85 (30)</td>
<td>112 (54)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Skin irritation</td>
<td>95 (34)</td>
<td>109 (52)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Mehtar et al. Antimicrobial Resistance and Infection Control (2016) 5:45
Effect of chlorine spraying on HCW while wearing PPE

HCW significantly higher chest symptoms than Ebola survivors

<table>
<thead>
<tr>
<th>Condition</th>
<th>HCW</th>
<th>Ebola Survivors</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye</td>
<td>45.0%</td>
<td>55.0%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Chest</td>
<td>66.4%</td>
<td>33.6%</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

Major respiratory damage in HCW & the population despite wearing PPE
Toxic effects of chlorine

- Chlorine poisoning can occur when you swallow or inhale chlorine.
- It reacts with water inside and outside of the body (such as the water in your digestive tract) to form hydrochloric acid and hydrochlorous acid. Both of these substances are extremely poisonous.
- Symptoms of this problem can include changes in the acid levels of your blood.
- Chlorine exposure can also cause low blood pressure.
163 staff interviewed; 49 air samples taken

Fig 1. Prevalence of work-related symptoms by disinfectant product use at a hospital, August 2015. Work-related symptoms were defined as symptoms that improved away from the facility, either on days off or on vacation. *Statistically significant differences using $\chi^2$ test ($P<.05$). †All symptoms specific to the last 12 months.
Chlorine & antimicrobial resistance

22 genera were isolated from chlorinated drinking-water with a range of susceptibilities to chlorine and antibiotics.

- Chlorine-resistant bacteria had higher MICs for tetracycline, sulfamethoxazole and amoxicillin.
- In the presence of free chlorine, antibiotic-sensitive bacteria survival was less than antibiotic-resistant bacteria.
- Weak correlations were found between chlorine-tolerance and minimum inhibitory concentrations against the antibiotics tetracycline, sulfamethoxazole and amoxicillin (*transmissible genes*) but not against ciprofloxacin (efflux pumps and porins) so most likely not on the *mac* operon.
- Antibiotic-resistant bacteria survived longer than antibiotic-sensitive organisms when exposed to free chlorine in a contact-time assay.
Disinfectant and the environment

Use of chlorine

- **Non biodegradable** and accumulates in the water effluent and water ways - kills natural flora
- **Impact on soil** and nitrogenous products-
- Impact on fish and wildlife
- Detrimental impact on the environment which is avoidable

If chlorine is to be applied as a surface disinfectant, it should be wiped on NOT sprayed
How should chlorine be used?

Take home message

- Clear indication of use in a policy- **first clean, then disinfect!**
- Apply chlorine to surface by wiping and not spraying
- Apply the correct concentration for the correct contact time
- Wipe off after contact time is over, to reduce corrosive activity especially on metals
- **DO NOT SPRAY THE ENVIRONMENT WITH CHLORINE!**
- **DO NOT SPRAY HUMANS WITH CHLORINE!**

The detection of SARS-CoV2 by RNA does not mean the virus is viable or infectious!