

UV-C technology and its effect on Coronavirus

July 15, 2021

In news- Union Minister of State for Science and Technology said that UV-C Disinfection Technology will soon be installed in Parliament for the “mitigation of airborne transmission of SARS-COV-2”.

Key updates-

- The UV-C air duct disinfection system was **developed by CSIR-CSIO (Central Scientific Instruments Organisation)**.
- The system is designed to fit into any existing air-ducts and the virucidal dosages using UV-C intensity and residence time can be optimised according to the existing space.
- The virus is deactivated in any aerosol particles by the calibrated levels of UV-C light.
- It can be used in auditoriums, malls, educational Institutions, AC buses, and in railways.
- The technology will **first be installed in the Central Hall, Lok Sabha Chamber and Committee Rooms 62 and 63.**

What is UV?

- Ultraviolet (UV) is a type of radiation naturally emitted by the Sun in a wavelength range of 100-400 nm.
- It is divided into **three bands:** UV-C (100-280 nm), UV-B (280-315 nm) and UV-A (315-400 nm).
- UV-A and UV-B rays from the Sun are transmitted through our atmosphere and **all UV-C is filtered by the ozone layer.**
- UV-B rays can only reach the outer layer of skin or epidermis and can cause sunburns and are also associated with skin cancer.

- UV-A rays can penetrate the middle layer of skin or the dermis and can cause aging of skin cells and indirect damage to cells' DNA.
- UV-C radiation has been used for decades to disinfect the air, water, and non-porous surfaces in hospitals, laboratories.
- But these conventional germicidal treatments are done in unoccupied rooms as they can cause skin burns and eye injuries.
- A paper published in June 2020 in Scientific Reports noted that **UV-C radiation can destroy the outer protein coating of the SARS-Coronavirus.**
- An in-vitro experiment conducted by Hiroshima University researchers showed that **99.7% of SARS-CoV-2 viral culture was killed when exposed to 222 nm UV-C irradiation** at 0.1 mW/cm² for 30-seconds.
- Researchers from the IIT, Kanpur, who developed a portable disinfectant device that used UV-C radiation (222-254 nm), noted that the device was specifically developed to disinfect non-living things.
- As viruses and bacteria are much smaller than human cells, far-UVC light can reach their DNA and kill them.
- However, the United States Food and Drug Administration (USFDA) has said that the effectiveness of UV-C against the SARS-CoV-2 virus is unknown.