



Office of the Principal Scientific Adviser  
to the Government of India

# Stop the Transmission, Crush the Pandemic.

Masks, distance, sanitation and ventilation  
to prevent the spread of SARS-CoV-2 virus.

May 2021



# Understanding SARS-CoV-2 Transmission

The SARS-CoV-2, is a highly pathogenic human coronavirus (HCoV), which has caused the global pandemic with alarming morbidity and mortality.

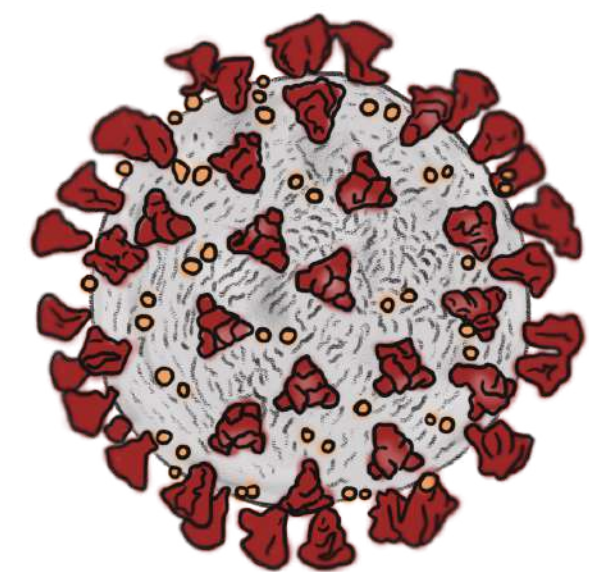
The virus spreads from human to human through saliva and nasal respiratory discharge. Mutations can accumulate in the virus which make new 'variants of concern.' Some virus variants may have higher transmission and infection rates.

**If COVID Appropriate Behaviour is not followed,** surges of infection can re-occur. The virus can quickly spread from a small number of people to a very large population.

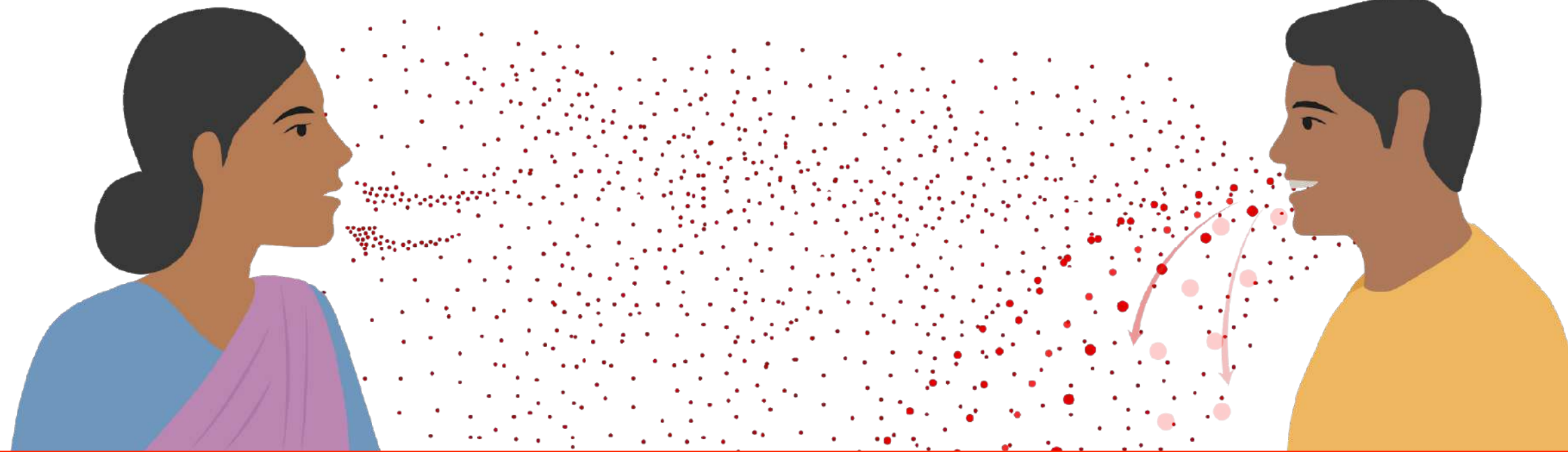
**Rigorously follow COVID Appropriate Behaviour to reduce and control the transmission of the virus.**

**Simple interventions and behaviour change can protect you and others from infection.**

**\*Always Remember:** People who show no symptoms can also spread the virus!

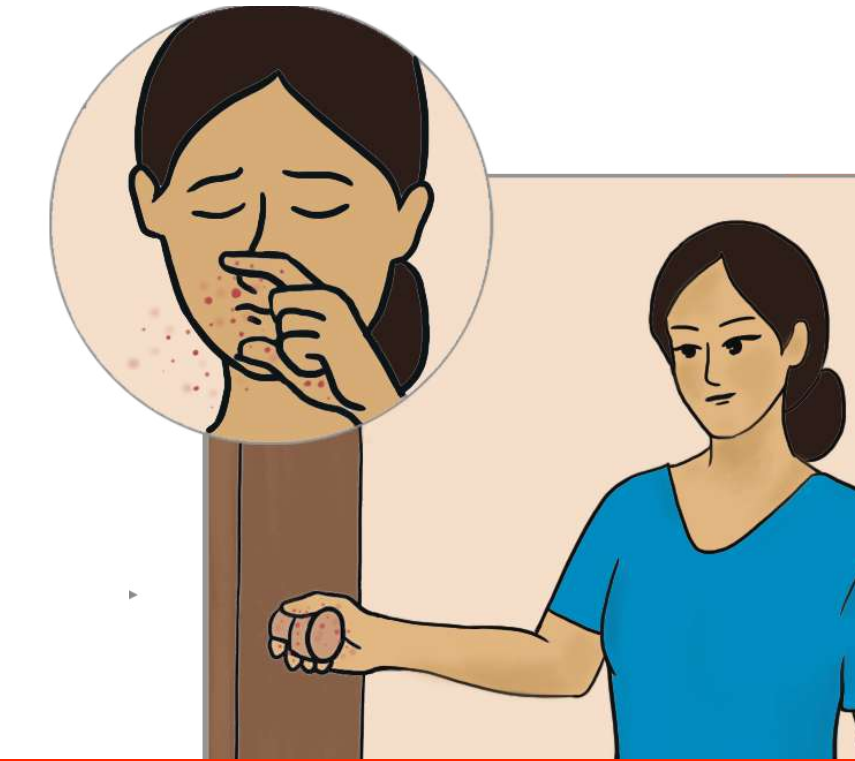


# 1. Aerosols



# 2. Droplets

# 3. Surface



## Key routes of virus transmission from one person to another.

- ▶ The SARS-CoV-2 multiplies in the body of an infected person, the 'host', and from there can be transmitted to others.
- ▶ The virus is released in the saliva and nasal discharge of an infected person through exhalation, talking, speaking, singing, laughing, coughing, and sneezing etc.
- ▶ Breaking the transmission of the virus from one person to another by following COVID Appropriate Behaviour will curtail the pandemic.

Even one infected person showing no symptoms can release enough droplets to create a “viral load” that can infect many others. Symptoms can take up to two weeks to appear in an infected person, during which time they may continue to transmit the virus to others. Some people may never show symptoms and still transmit the virus.



**\* Wear a mask even when you are around people who do not show any symptoms of infection.**

# Aerosol and Droplet Transmission

Saliva and nasal discharge in the form of droplets and aerosols carry the virus from one person to another.

Larger size droplets fall to the ground and on surfaces, and smaller aerosol particles are carried in the air to greater distances.

In closed un-ventilated indoor spaces, droplets and aerosols become quickly concentrated and greatly increase the risk of transmission to people in the area.

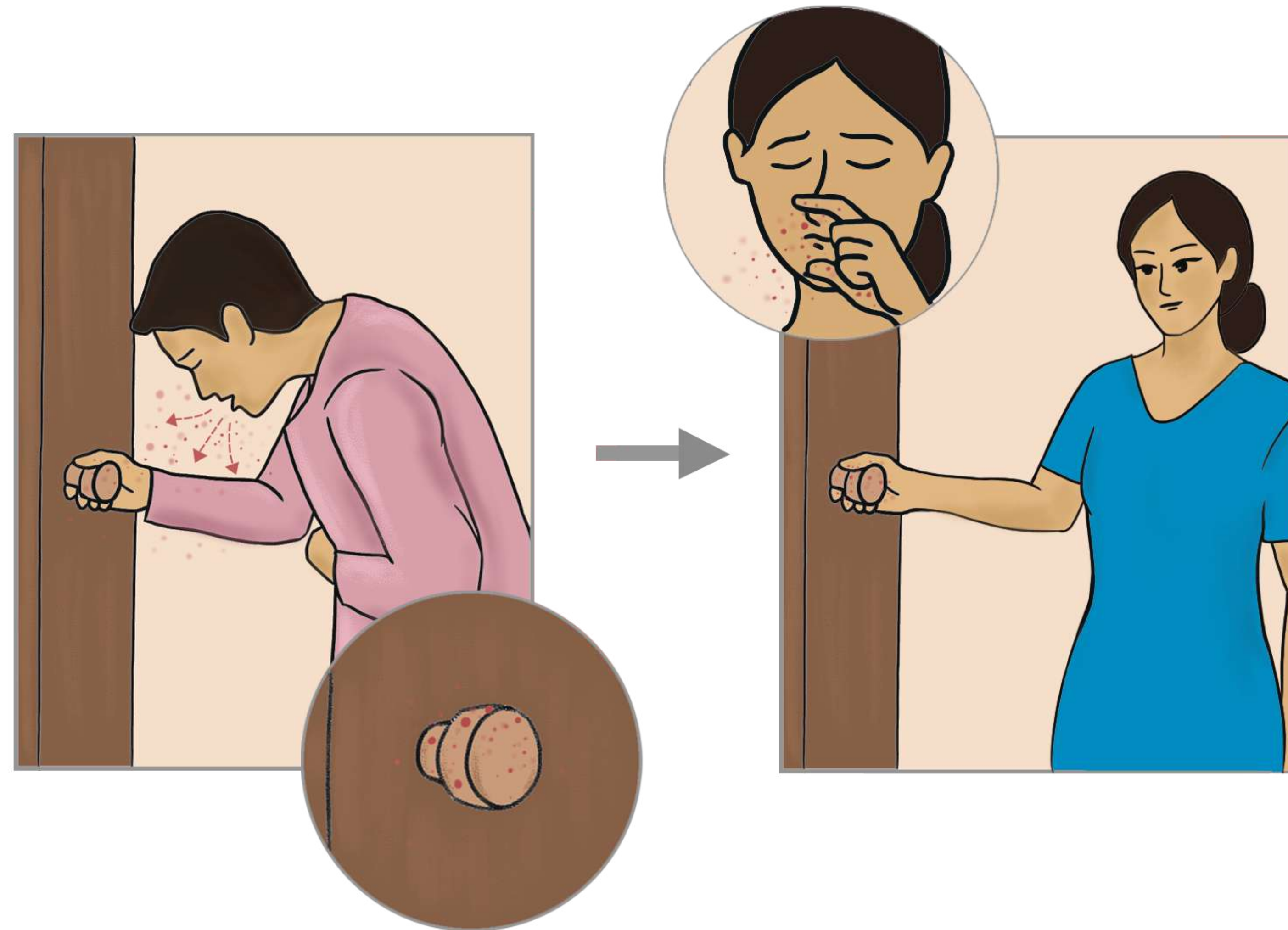
Infection transmission risk is much lower in outdoor areas, as virus particles get quickly dispersed.

☼ Just as smells can be diluted by ventilation, the dangerous concentration of the virus can be reduced by ensuring that outdoor air flows in.



# Surface Transmission

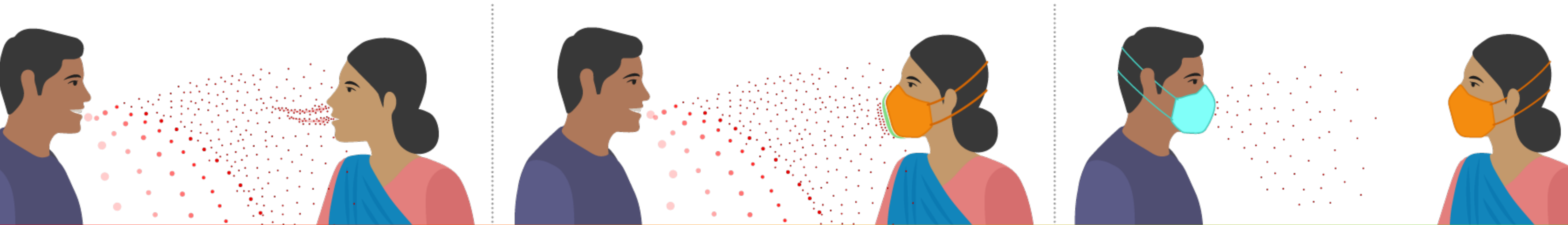
- ▶ Droplets emitted by an infected person land on various surfaces.
- ▶ When someone touches these contaminated surfaces, and, without washing hands with soap, touches their mouth, nose or eyes, they can contract the virus.
- ▶ These virus laden droplets can survive on non porous surfaces such as glass, plastic and stainless steel for a fairly long time.



**\* Frequent cleaning of high contact points such as door handles, light switches, tables, chairs and the floor with disinfectants, like bleach and phenyl, can remove the virus contamination from surfaces.**

# Wear Masks

PSA Guidelines on Masks here: <https://static.psa.gov.in/psa-prod/publication/ManualonHomemadeCover.pdf>



**Very High Risk**

**High Risk**

**Low Risk**

- ✓ A double layer cotton homemade mask is better than none.
- ✓ N95 mask offers maximum protection.

## A mask should:

- Fit snugly on your face leaving no air pockets around your nose or chin.
- Cloth masks should be washed and sun-dried each day.

\* Wear masks when away from home and also at home when with outsiders.

## Pair Two Masks Together

\* *Double masking recommended*



## For Double Masking:

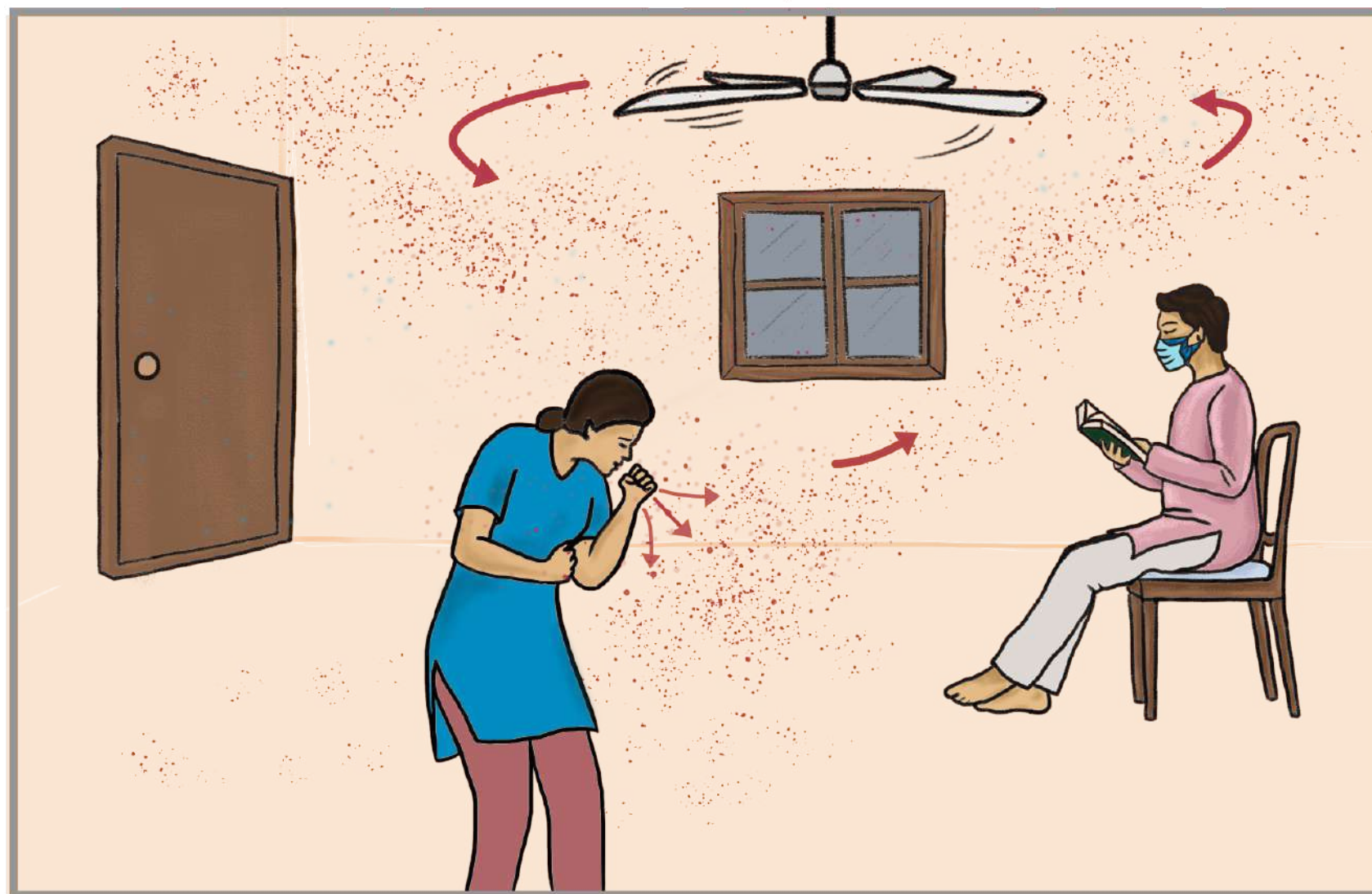
- Wear a surgical mask, then wear another tight fitting cloth mask over it.
- If you do not have a surgical mask, wear two cotton masks together.
- Ideally surgical mask should be used only once, but when pairing, you can use it up to 5 times by leaving it in a dry place for 7 days after one use (ideally give it some sun exposure) and then reuse as double layer.

**Surgical masks should never be washed.**

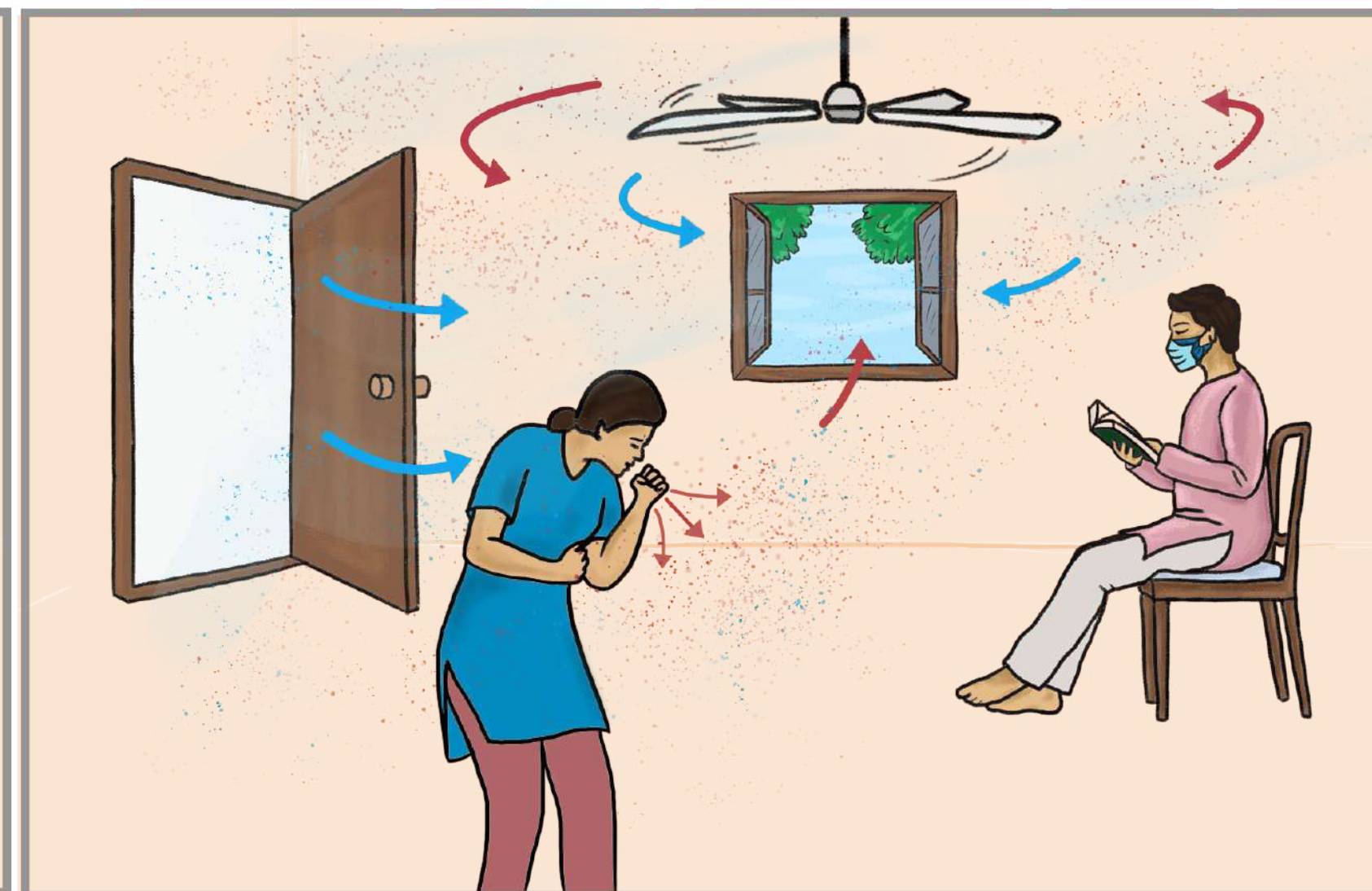
# Ventilation: Home

Let outdoor air flow in to displace indoor air. This directional air flow and improved ventilation can lower the potential for infection from accumulated viral load in closed spaces. **Better the ventilation, lower the potential for transmission.**

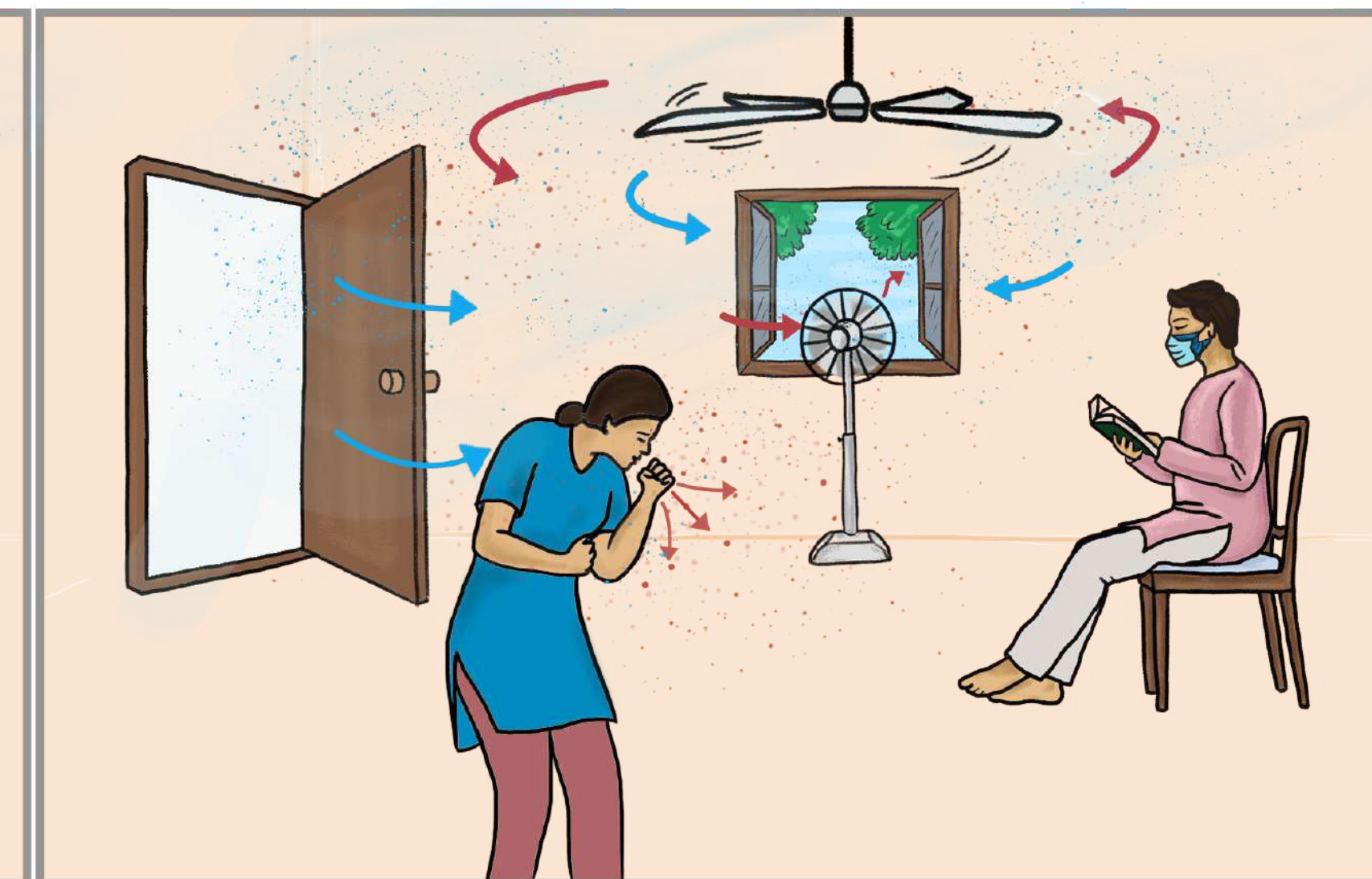
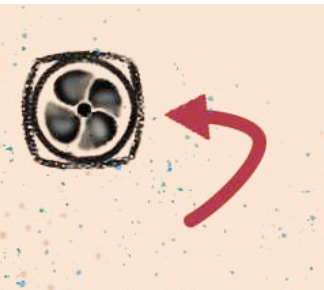
**Poor Ventilation** (windows and doors shut)



**Good Ventilation** (windows and doors open)



**Ideal Ventilation** (exhaust system)

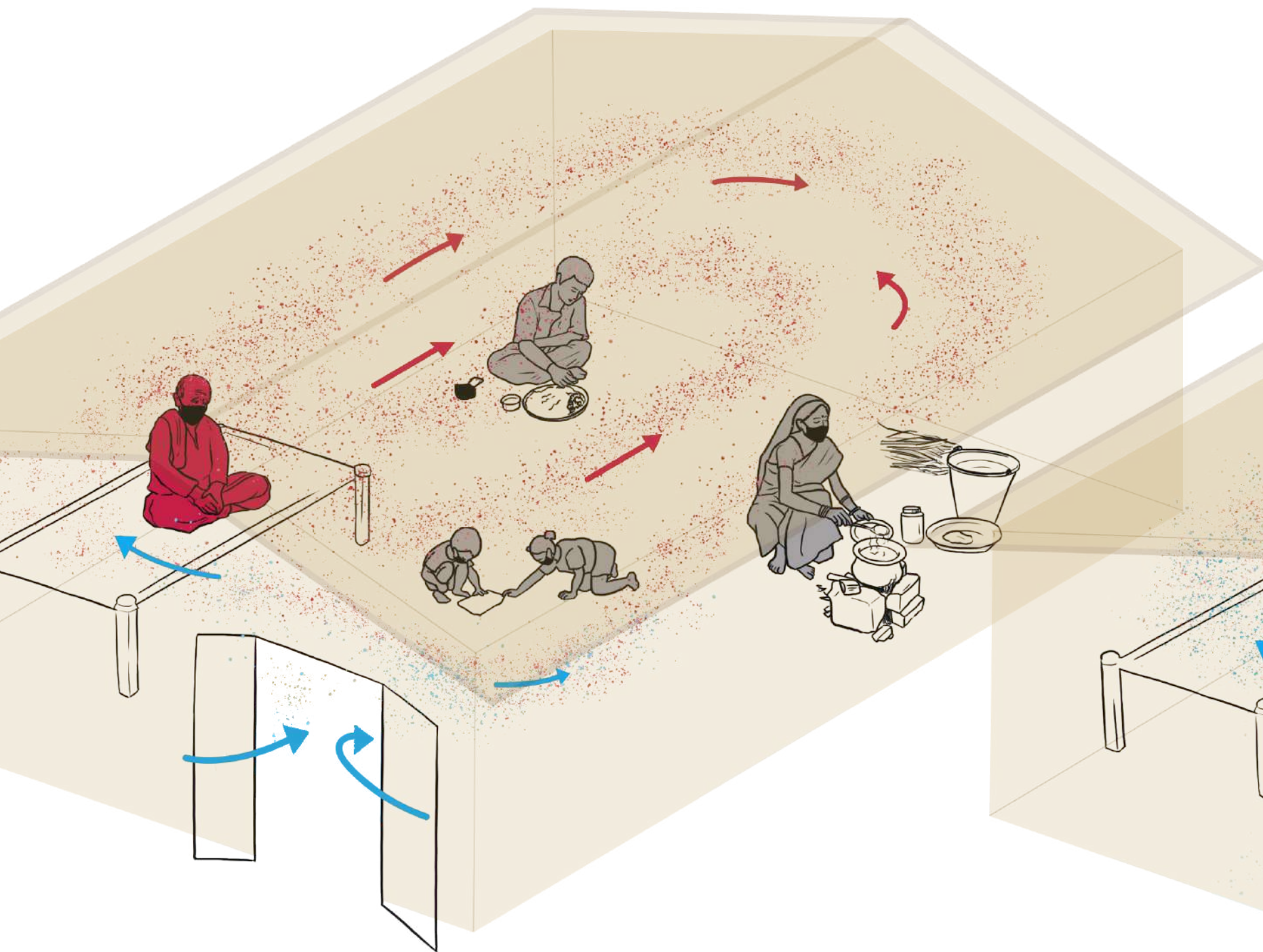


**Fan placement is important.** Avoid placing fans in a way that could potentially cause contaminated air to flow directly to someone else. **Installing an exhaust fan is important.** Keep exhaust fans running if the windows and doors are shut.

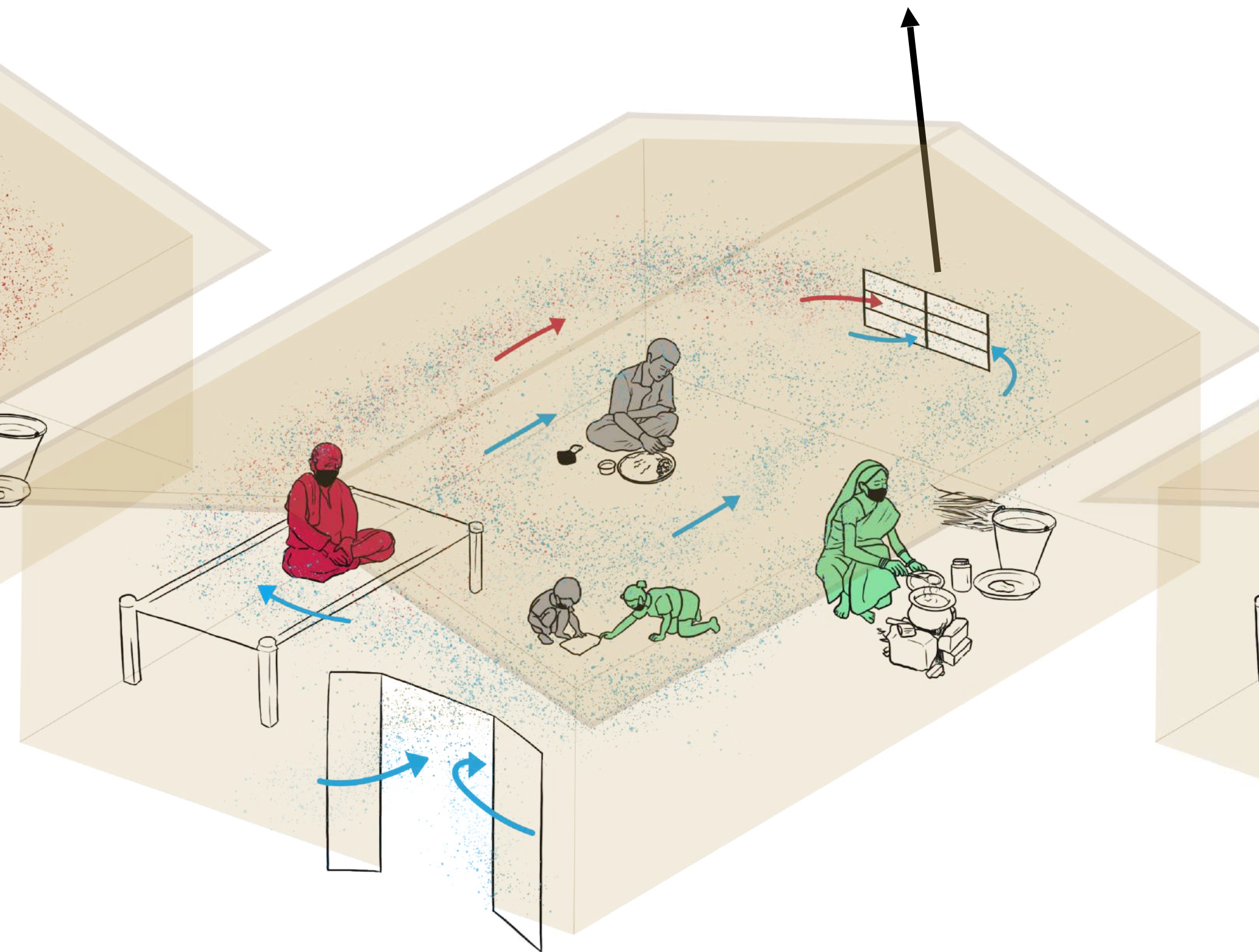
*Add an exhaust fan OR turn a pedestal fan into an exhaust fan by turning it to face outdoors, to create the ideal air flow for maximum protection from indoor infection.*

# Ventilation: Hutments

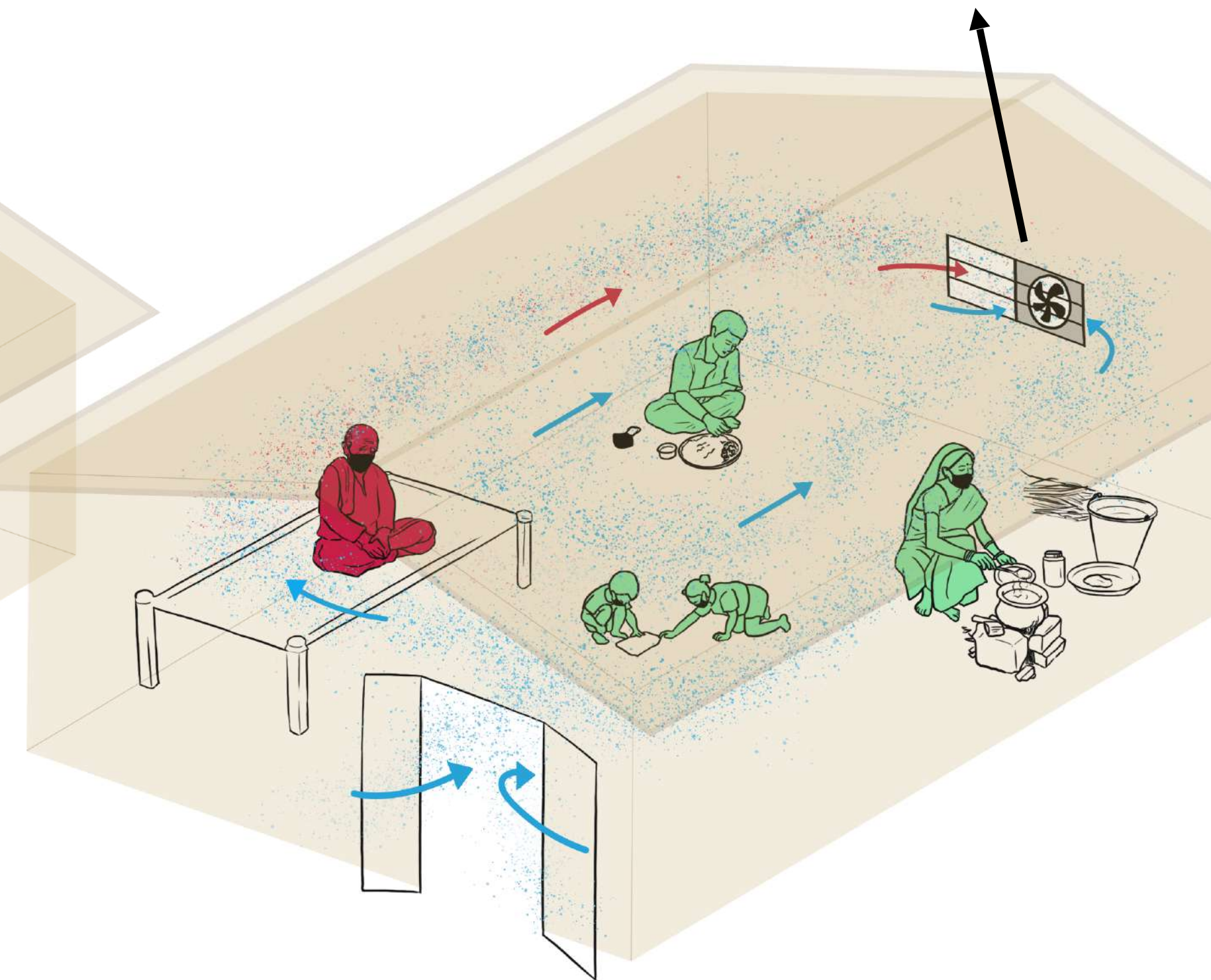
1. Poor Ventilation  
(no air circulation).



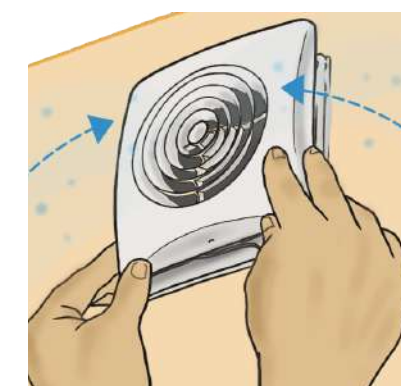
2. Adding jaali or another simple air outlet improves directional air flow and reduces viral load.



3. Installing exhaust fans next to the jaali/ air outlet further improves directional air flow to lower the risk of transmission.



**Lack of window/cross ventilation creates excessive viral load and increases chances of infection inside poorly ventilated spaces.**

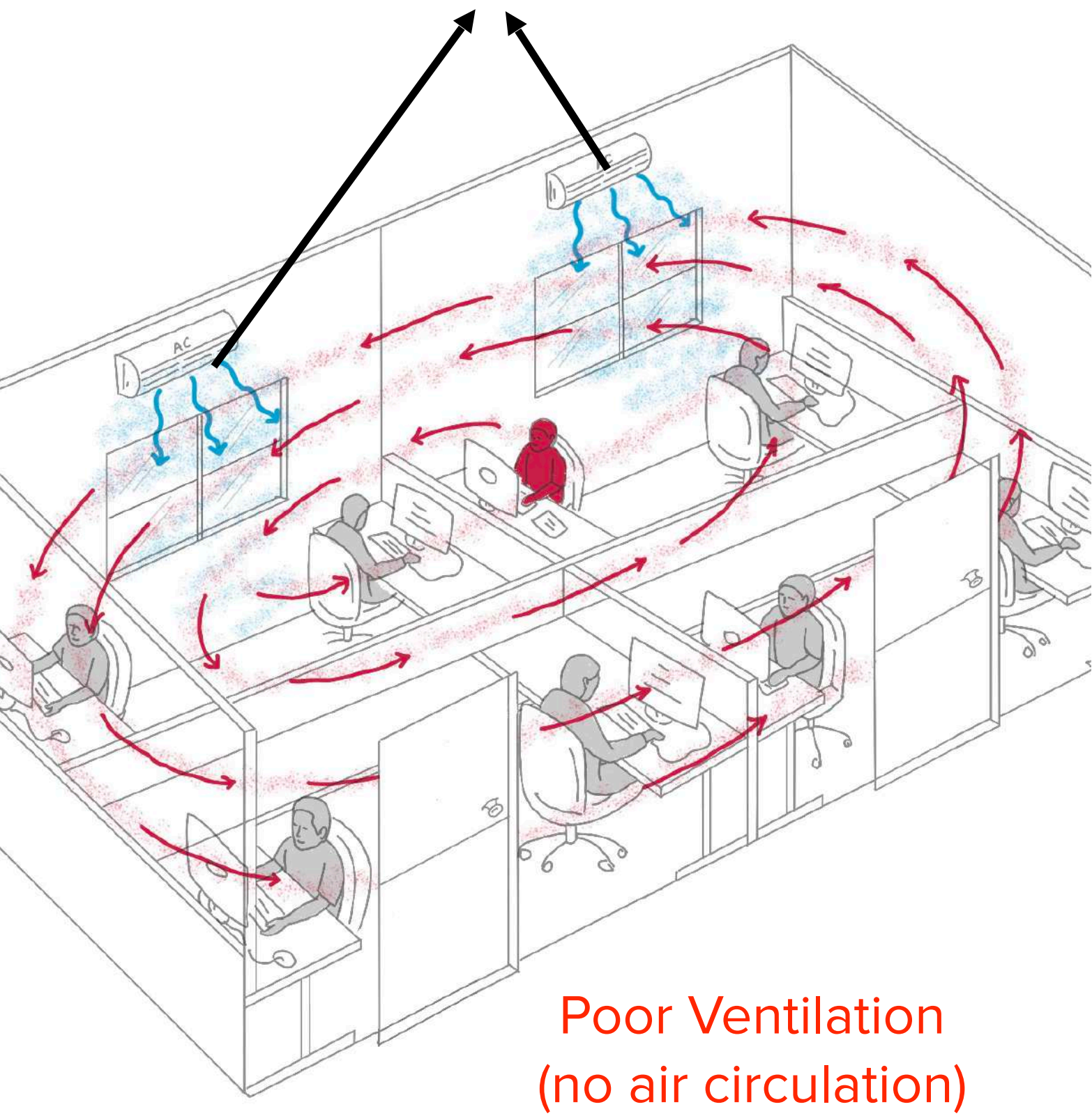


\* It is advised that jaali/air outlets with exhaust fans are installed by gram panchayats in homes where there is no cross-ventilation.

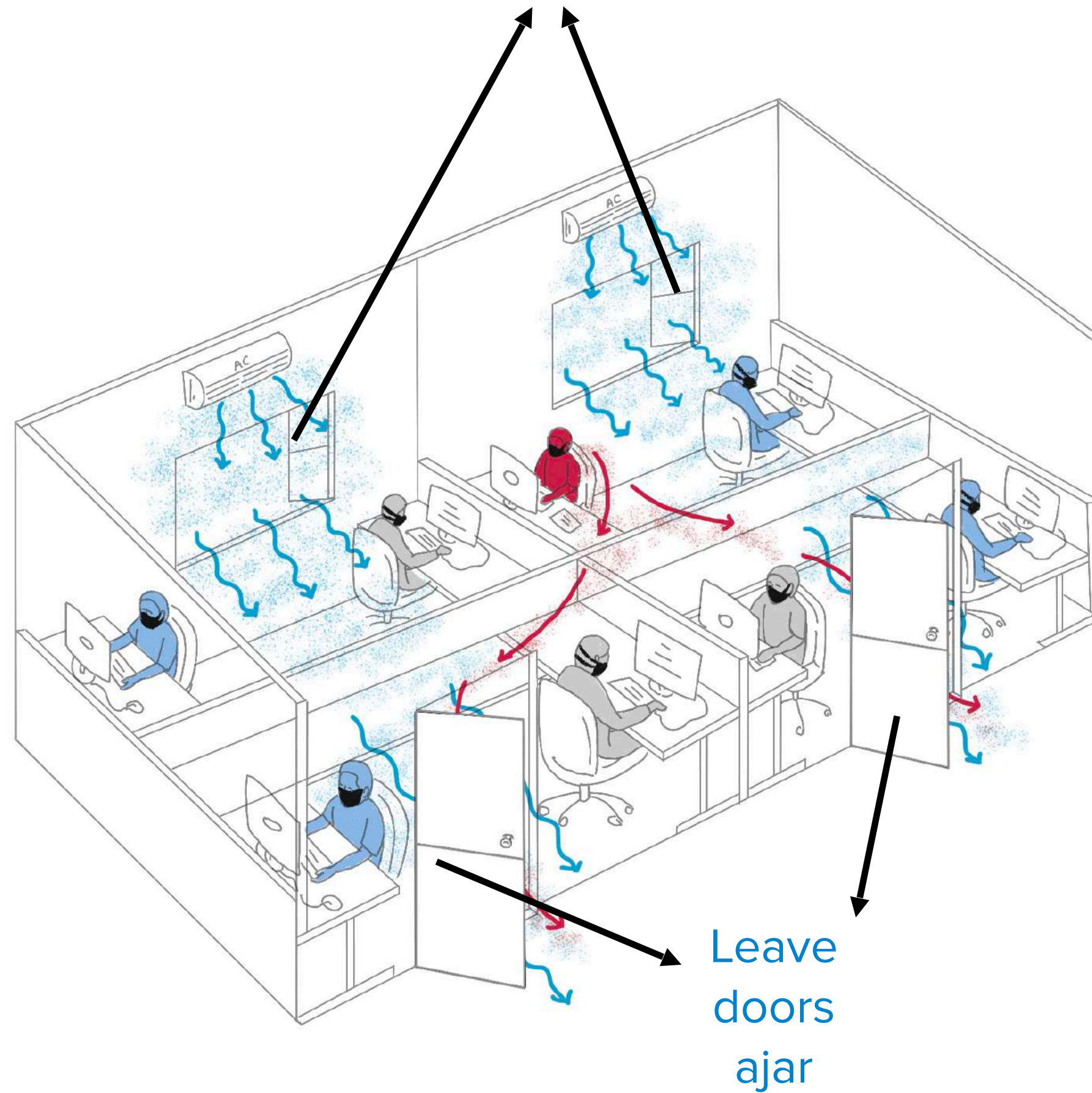


# Ventilation: Work Spaces

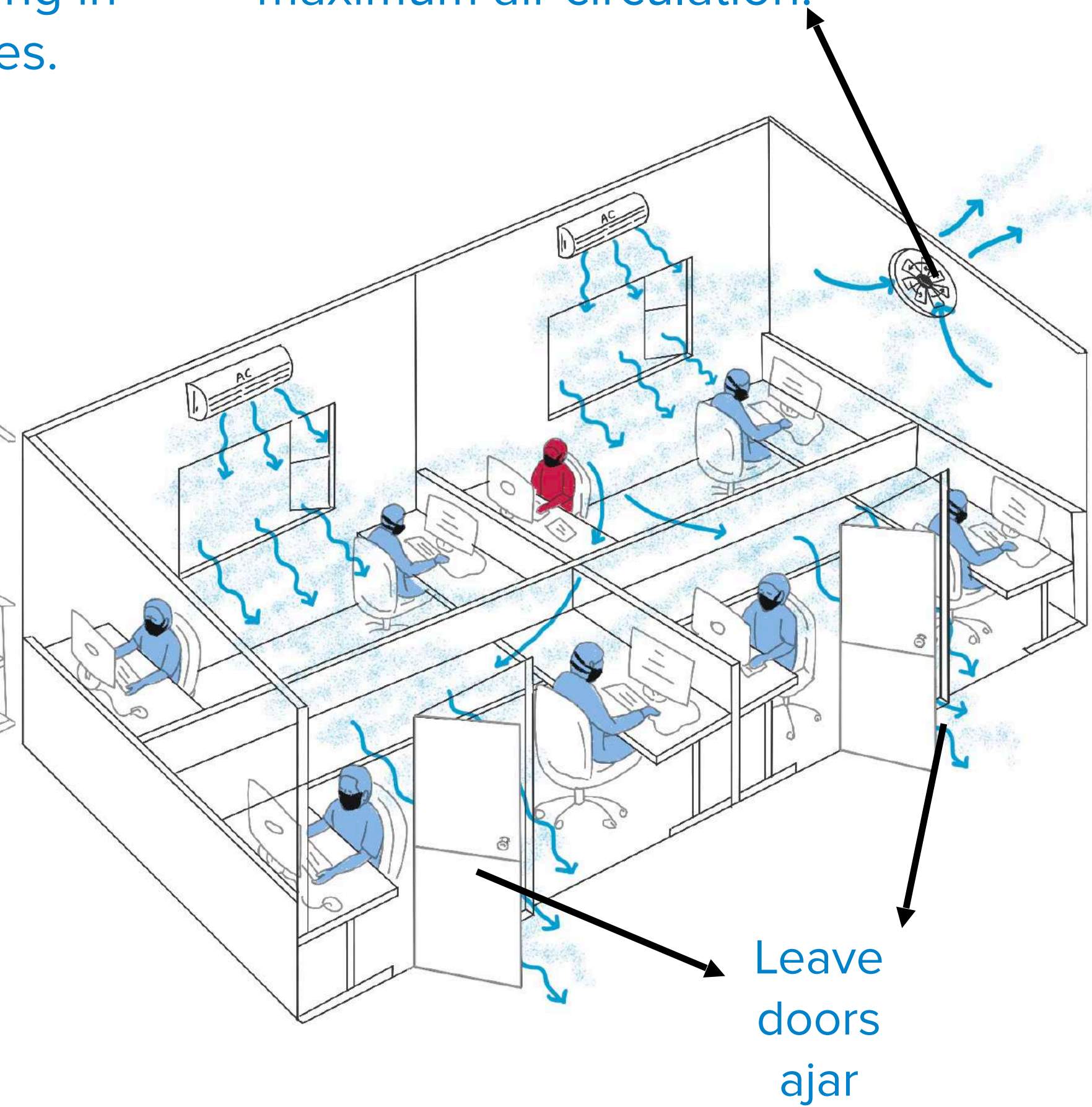
1. Running ACs while keeping windows and doors shut, traps infected air inside the room, and increases risk of transmission from an infected carrier to others.



2. Keep windows and doors ajar while the ACs are running to bring in clean air and dilute virus particles.

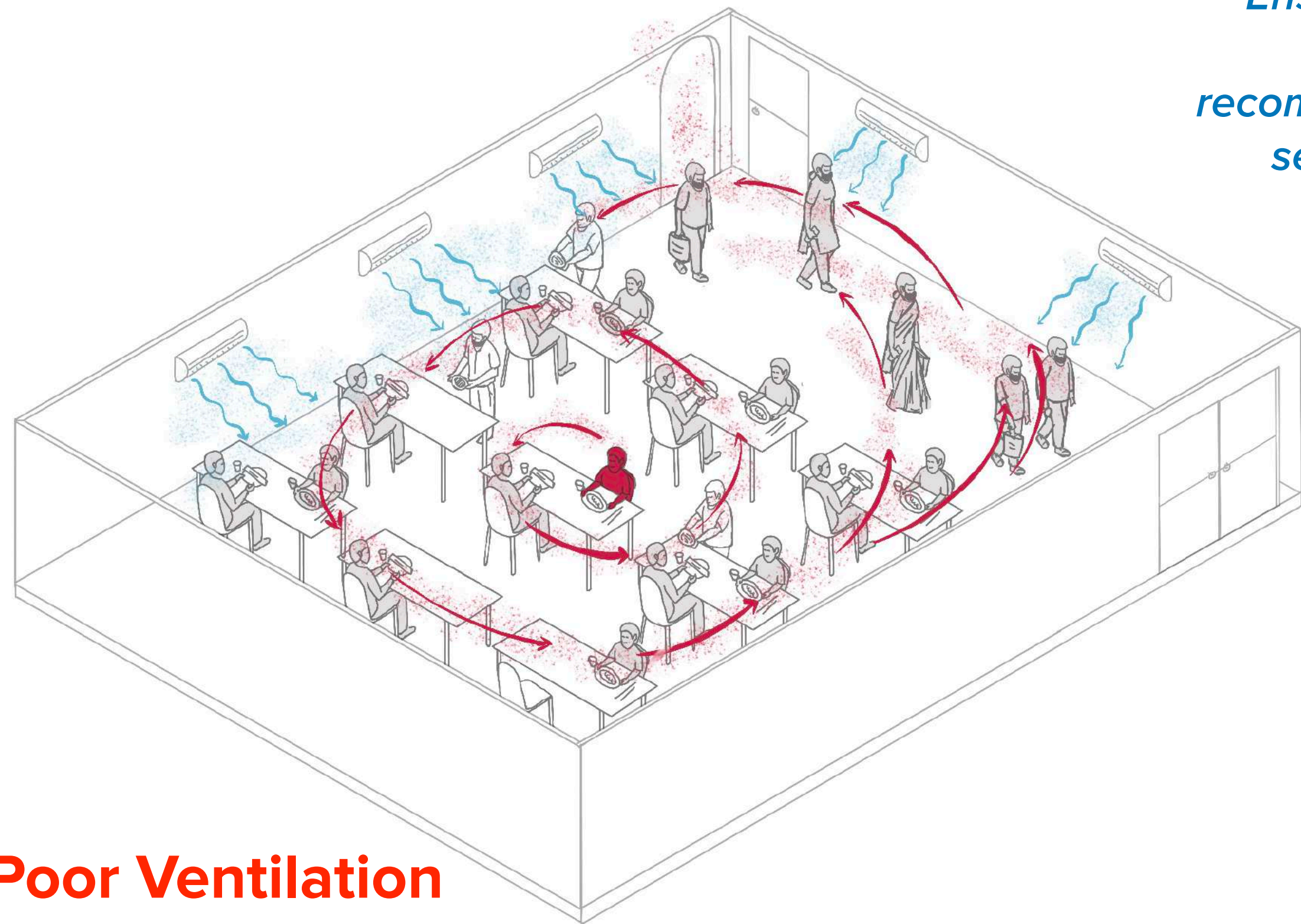


3. Add gable/exhaust fan for maximum air circulation.

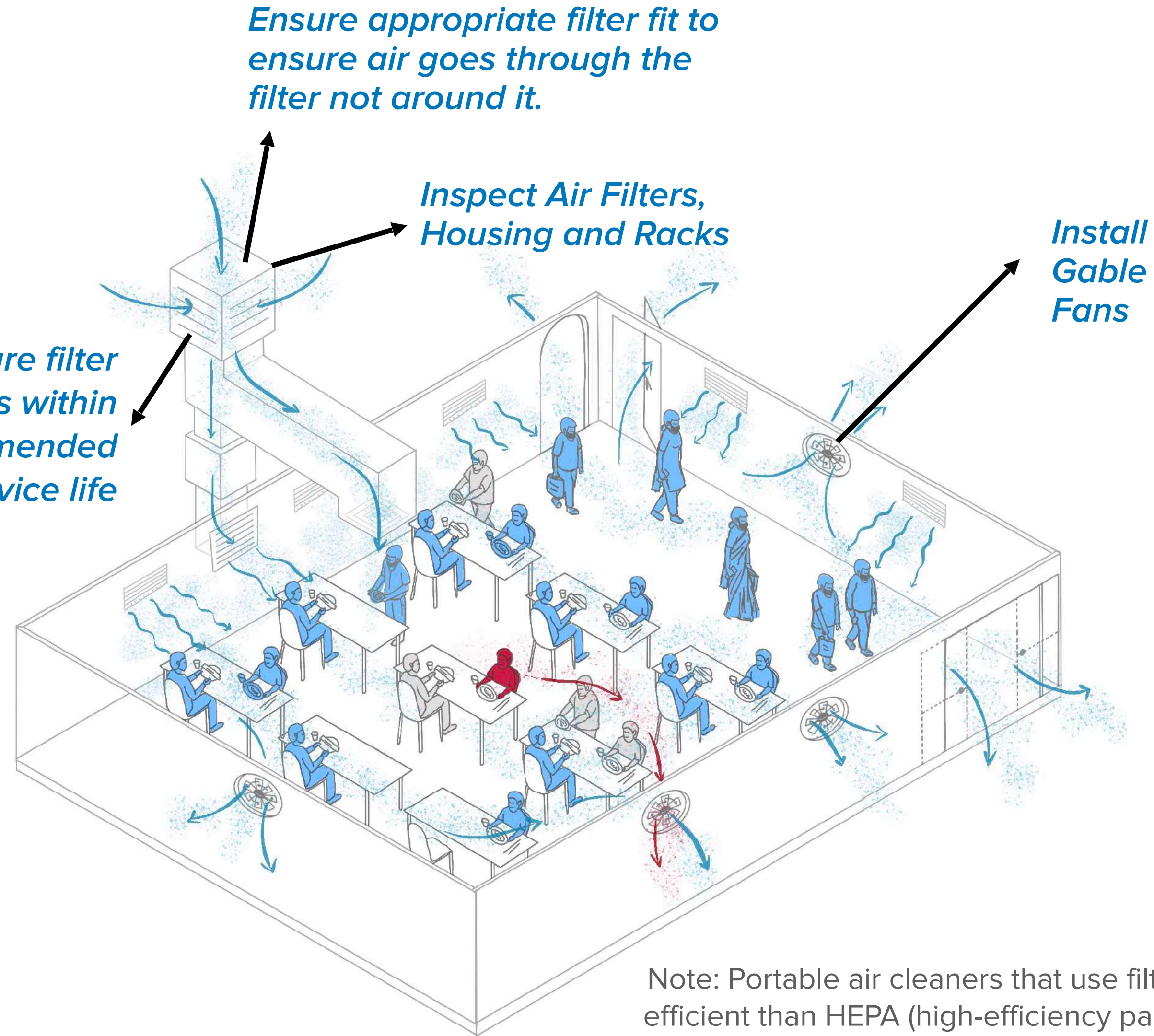


# Ventilation: Centralized Air Management Systems

Improved central air filtration/increased filtration efficiency is especially helpful when outdoor air delivery options are limited. **Roof ventilators and HEPA/regular filters are recommended in offices, auditoriums, shopping malls etc.** These filters must be regularly cleaned or replaced.



**Poor Ventilation**



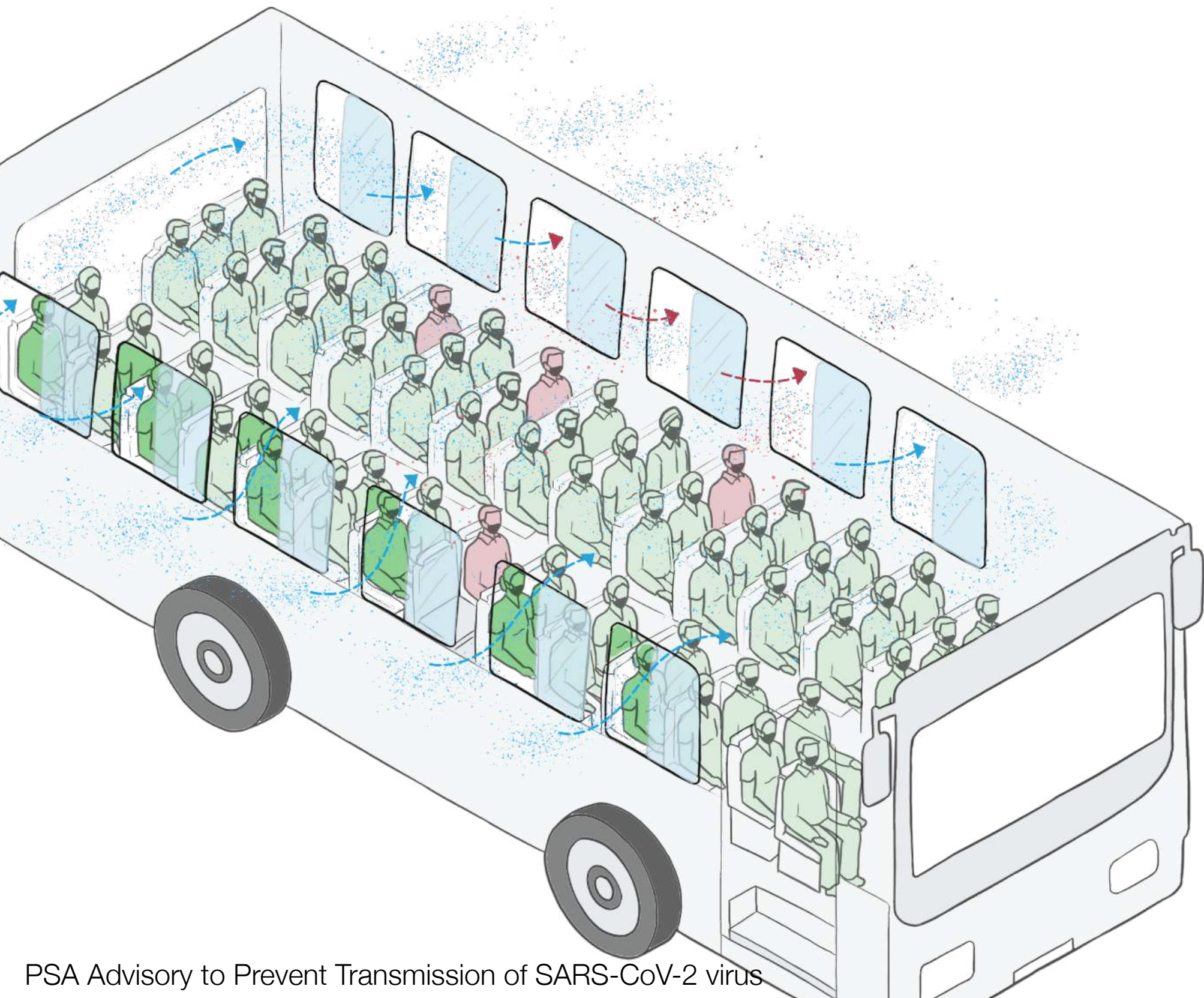
**Ideal Ventilation**

Note: Portable air cleaners that use filters less efficient than HEPA (high-efficiency particulate air) filters also exist and can contribute to room air cleaning. However, they should be clearly labeled as non-HEPA units.

# Ventilation: Additional Considerations

Ensure cross flow of air in public transport vehicles:

- Keep windows open in buses and trains where possible
- Introduce exhaust systems to improve airflow in air conditioned buses and trains
- Also introduce HEPA/regular filters in air conditioning systems. These should be cleaned and replaced regularly.



Higher ventilation and directional air flow away from people can curtail the transmission of the virus.



*\*Hospitals and health centers must ensure that vaccinations are carried out in well-ventilated and directional air flow controlled areas.*

# Community-level Testing and Isolation

(For rural/semi-urban areas)

- Get Rapid Antigen Testing done for people entering the area.
- ASHA/Anganwadi/Health Workers must be trained and protected for conducting the Rapid Antigen Test.

- These health workers must be given a certified N95 mask even if they are vaccinated.
- ASHA/Anganwadi/Health Workers to also be provided oximeters to monitor infected person.

**\* Every person who tests positive should be given a certified N95 mask, or a surgical mask if this is not feasible, and advised isolated as per ICMR guidelines.**



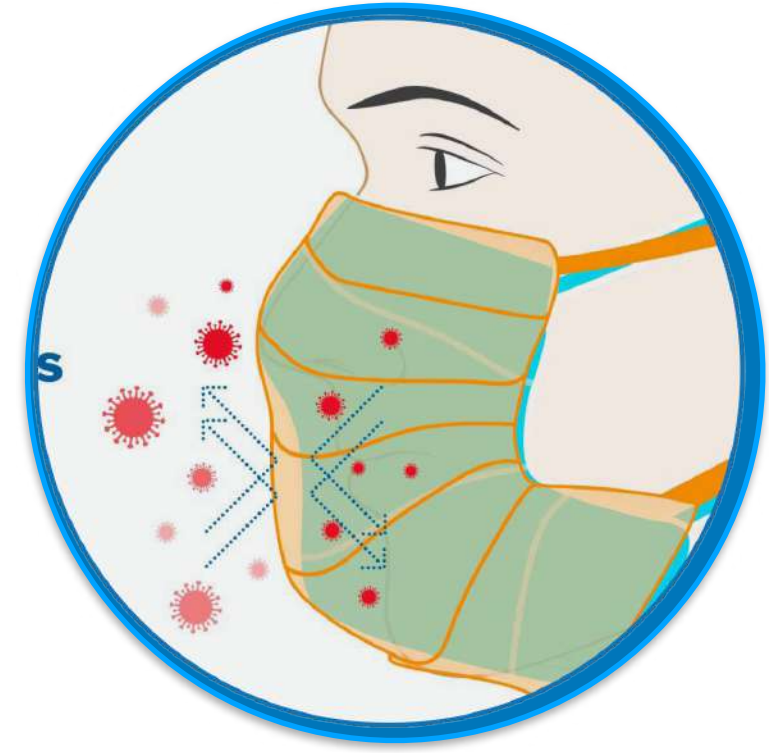
**PSA Guidelines on Home Isolation**

<https://www.psa.gov.in/innerPage/psa-initiatives/home-care-tips-managing-covid-19/2820/2820>



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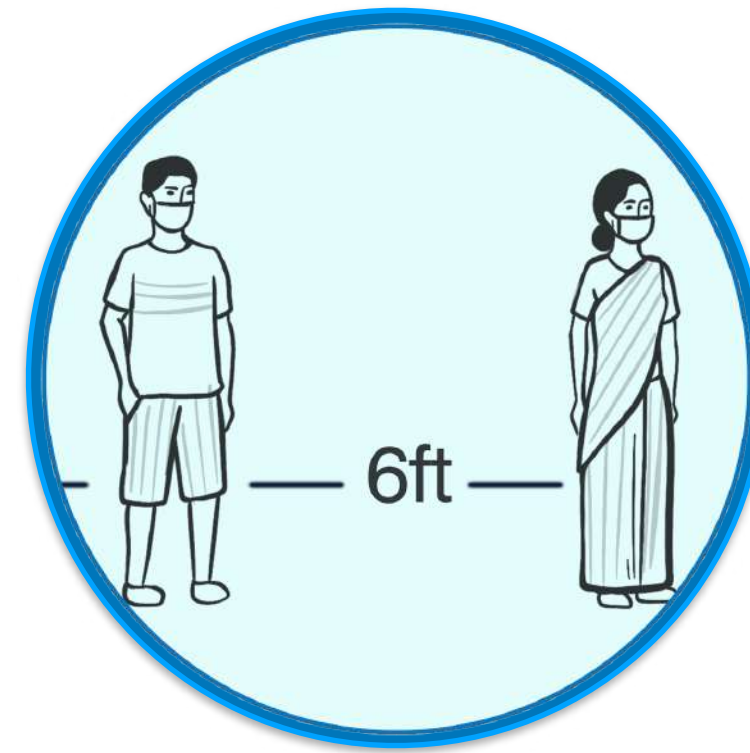
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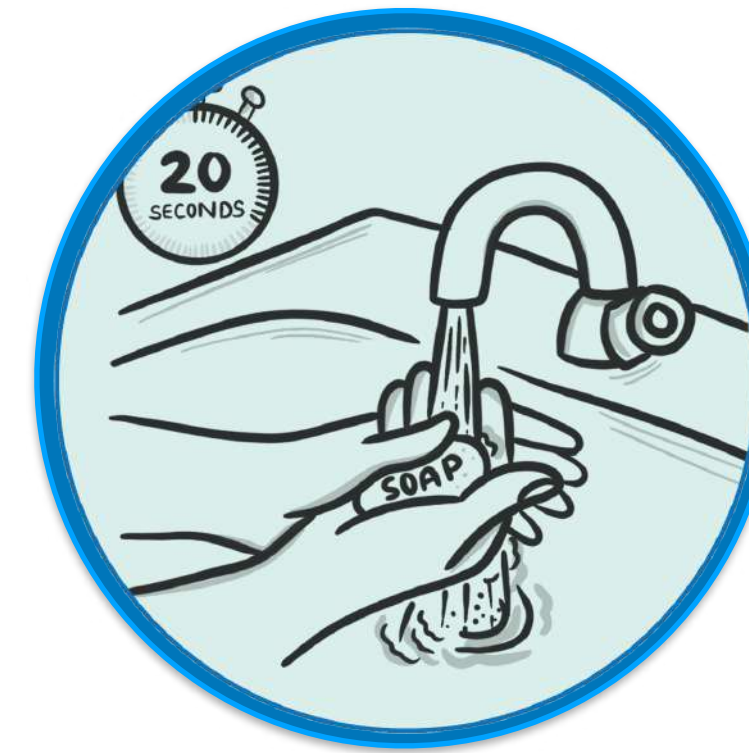
Wear  
Double  
Masks



Keep  
Areas  
Well-  
Ventilated



Maintain  
Physical  
Distancing



Wash  
Hands  
with  
Soap  
Often



Isolate  
COVID  
positive  
patients



Disinfect  
Surfaces  
Regularly

Design and Research: **Vertiver**