

# AirHavn Pro

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Particle Removal - Final Testing

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# Particle Removal - Final Tests

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Testing designed to measure the AirHavn Pro particle removal within an enclosed space of similar size to typical dental surgery rooms.

Tests conducted at the University of Copenhagen, Department of Atmospheric Chemistry.



# Production Unit

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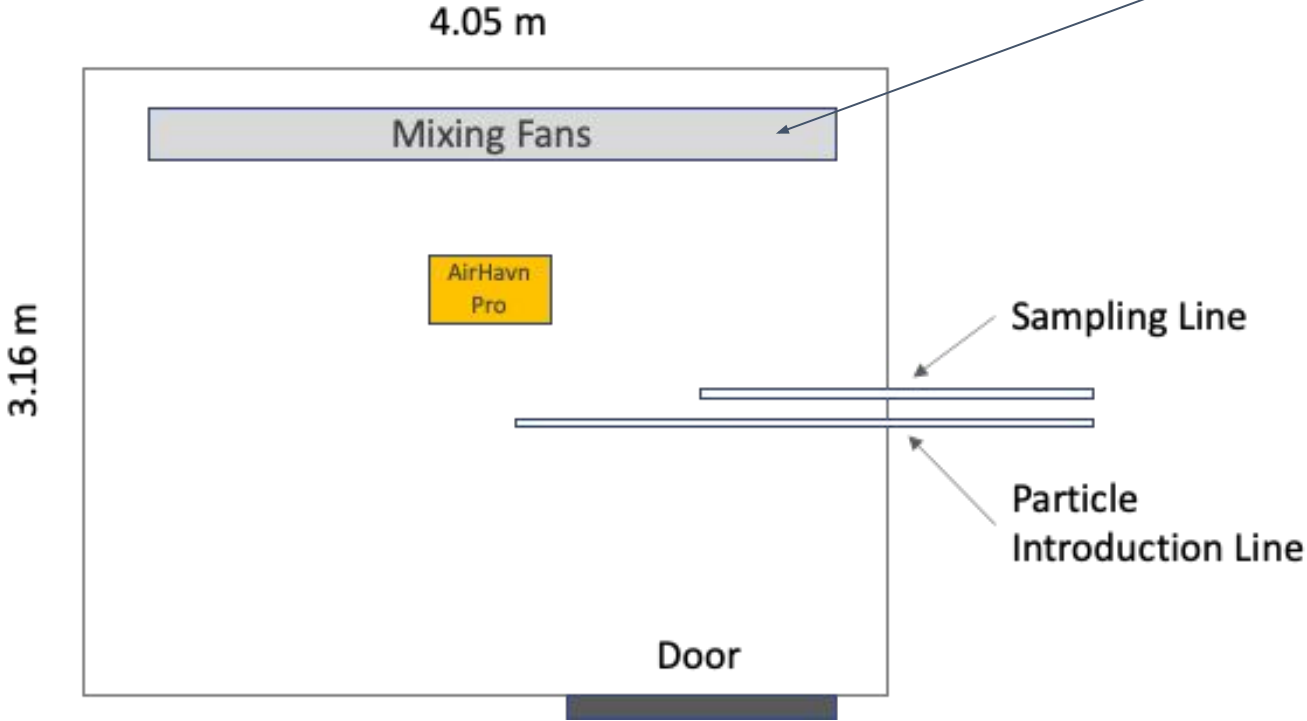


# Test Chamber

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# Test Chamber Configuration





# Test Equipment

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Particle Source:

Ammonium chloride ( $\text{NH}_4\text{Cl}$ )

Incense

TSI SMPS 3080

Measuring particles 100 nm

TSI Optical Particle Sizer

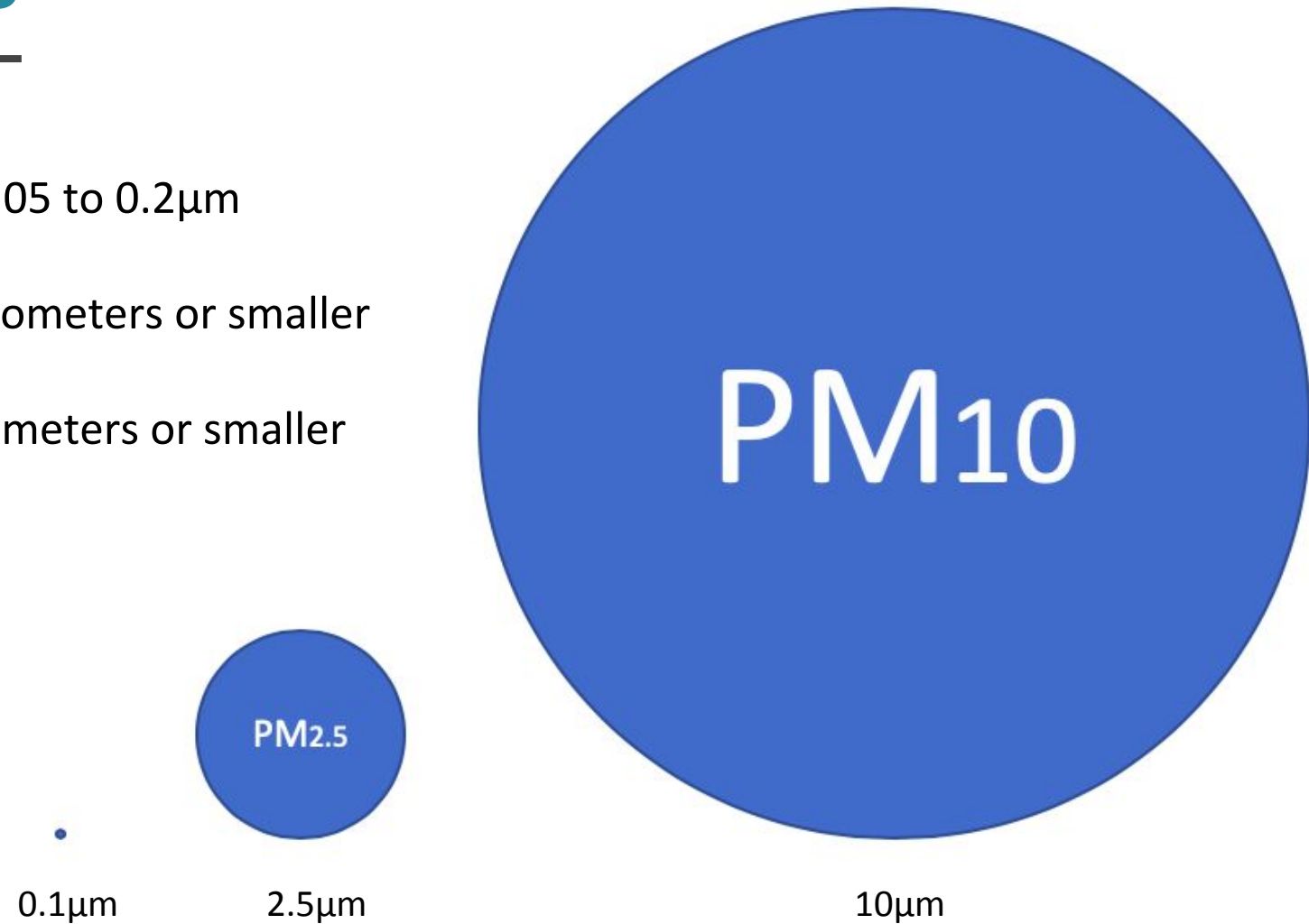
Measuring particles 0.3 micrometers - 10 micrometers



# Particle Sizes

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- 100nm (0.1  $\mu\text{m}$ ) - virus 0.05 to 0.2 $\mu\text{m}$
- PM2.5 - particles 2.5 micrometers or smaller
- PM10 - particles 10 micrometers or smaller



Relative Size

# Removal Efficiency (RE) Tests

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- Very high removal efficiency on the higher fan speed - close to HEPA
- Slightly higher efficiency with PM2.5 and PM10 particles

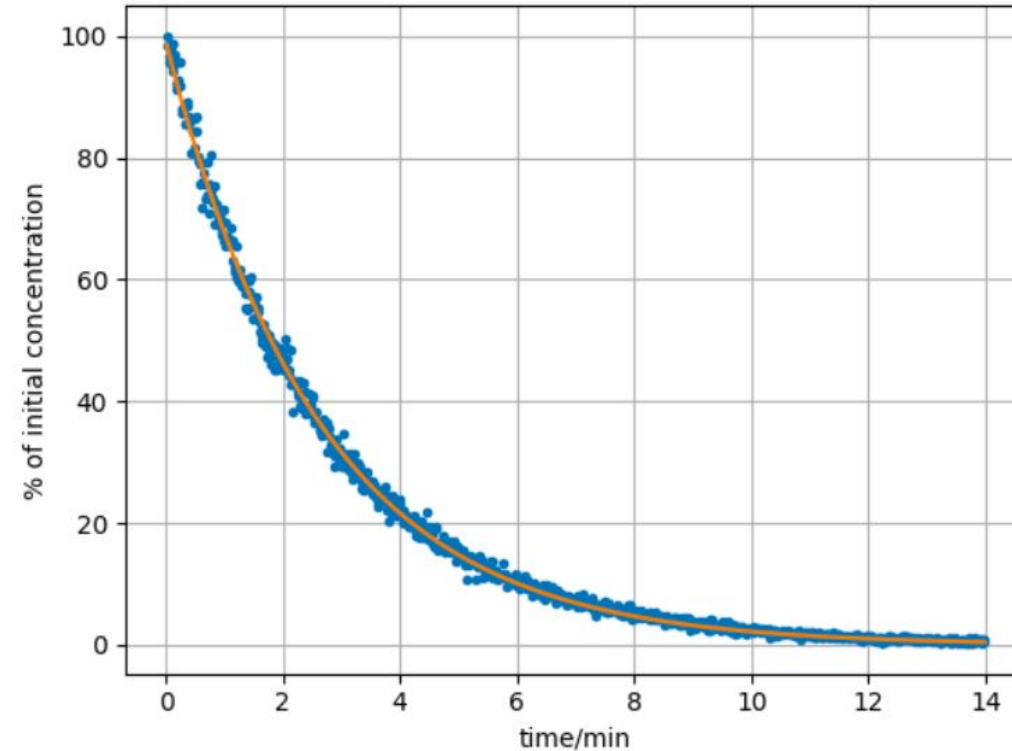
Fan Speed	RE% 100 nm	RE% PM2.5	RE% PM10
1	93.9	96	95.8
2	94.9	95.8	96.1
3	97.9	99.4	99.4



# 100nm Particles

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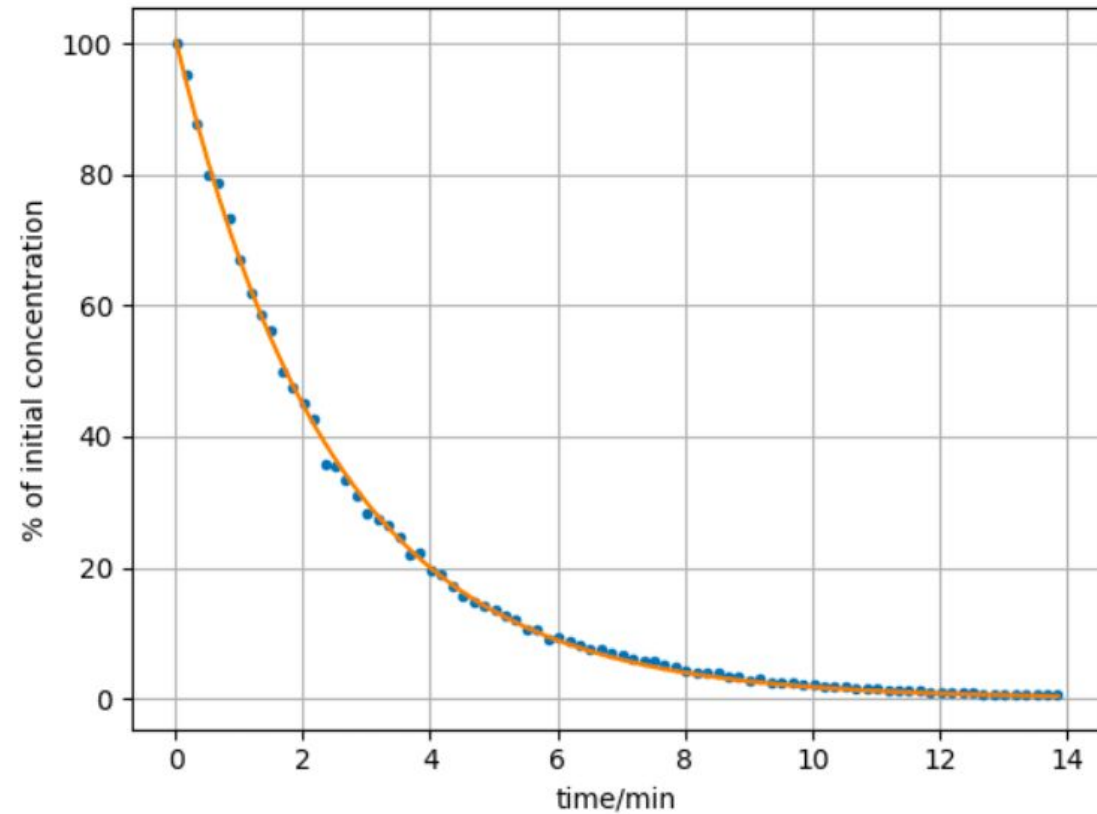
- 0.1  $\mu\text{m}$  (virus 0.05 to 0.2 $\mu\text{m}$ )
- 50% reduction in 1.5 minutes
- 90% reduction in under 7 minutes
- Residual levels by 12 minutes



# 0.3 $\mu\text{m}$ - 10 $\mu\text{m}$ Particles

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- 0.3 - 10  $\mu\text{m}$
- 50% reduction in 1.5 minutes
- 90% reduction in just over 6 minutes
- Residual levels by 12 minutes
- CADR measured at 705  $\text{m}^3/\text{hr}$



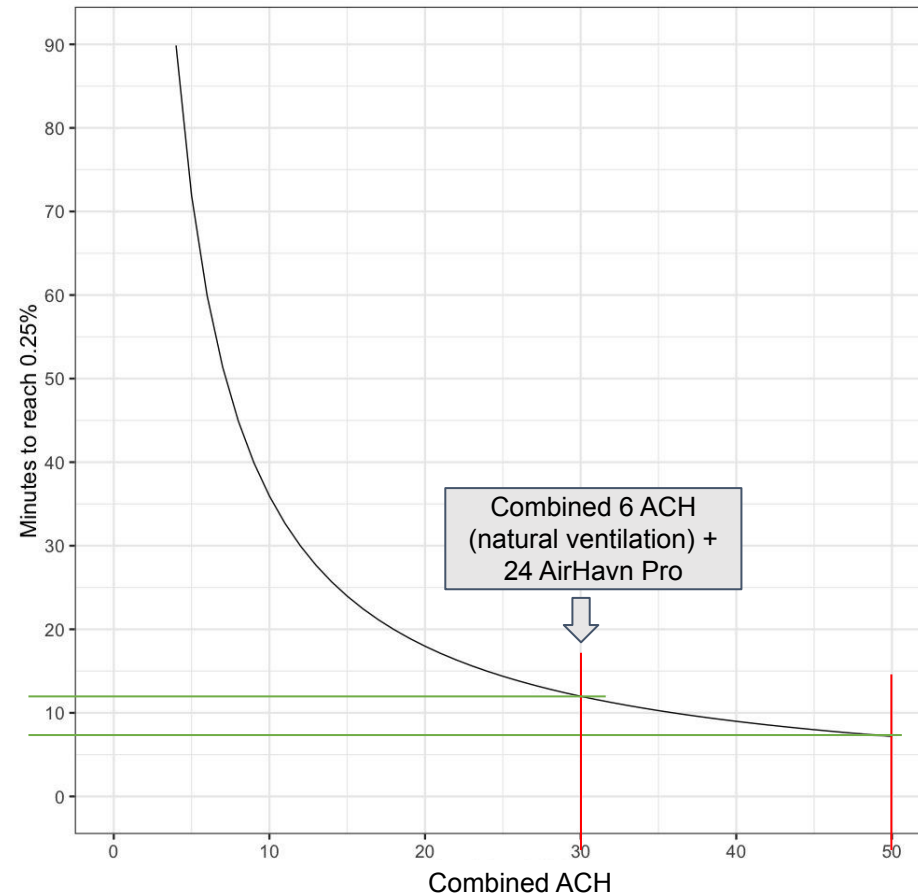
# Lab Testing Summary

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	PM2.5
Airflow	712 m <sup>3</sup> /hr
Filter Efficiency	99%
CADR	705 m <sup>3</sup> /hr
ACH in 50m <sup>2</sup> room	6

# What does this mean?

- 3 x 4 m dental room = 29m<sup>3</sup>
- ACH @ 705 m<sup>3</sup>/hr = 24
- Combined Air Change Rate = 30  
(plus 6 ACH natural ventilation)
- Minutes to reach 0.25% = 12 mins  
(as shown in lab tests)
- Diminishing returns from higher ACH - increasing to 50 ACH only reduces the fallow time by 4.5 mins

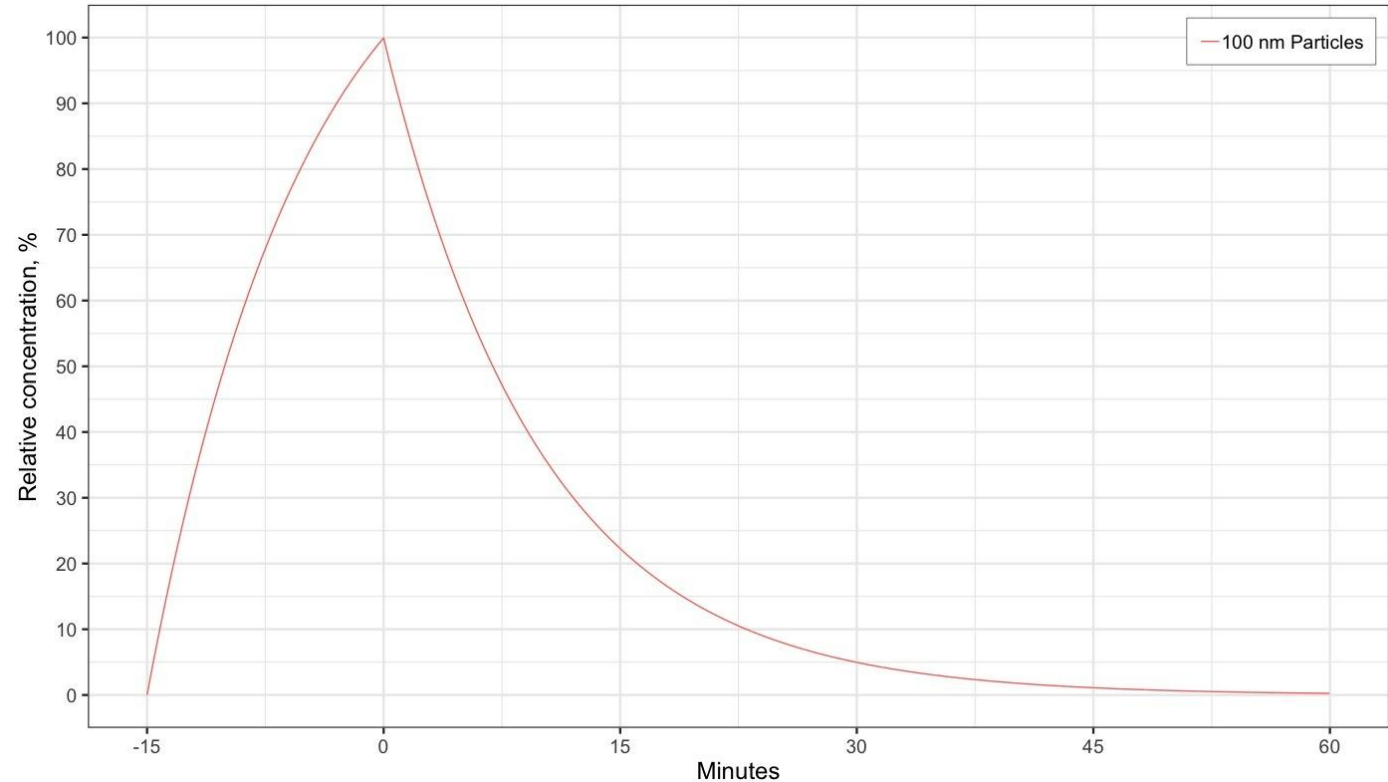


# What does this mean?

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## No air cleaning

- Asymptomatic patient enters room
- Concentration of virus particles rises to 100%
- 15 minute procedure
- Patient leaves room at time “0”
- Natural decay based on 6 ACH
- Takes 60 mins to reach 0.25%



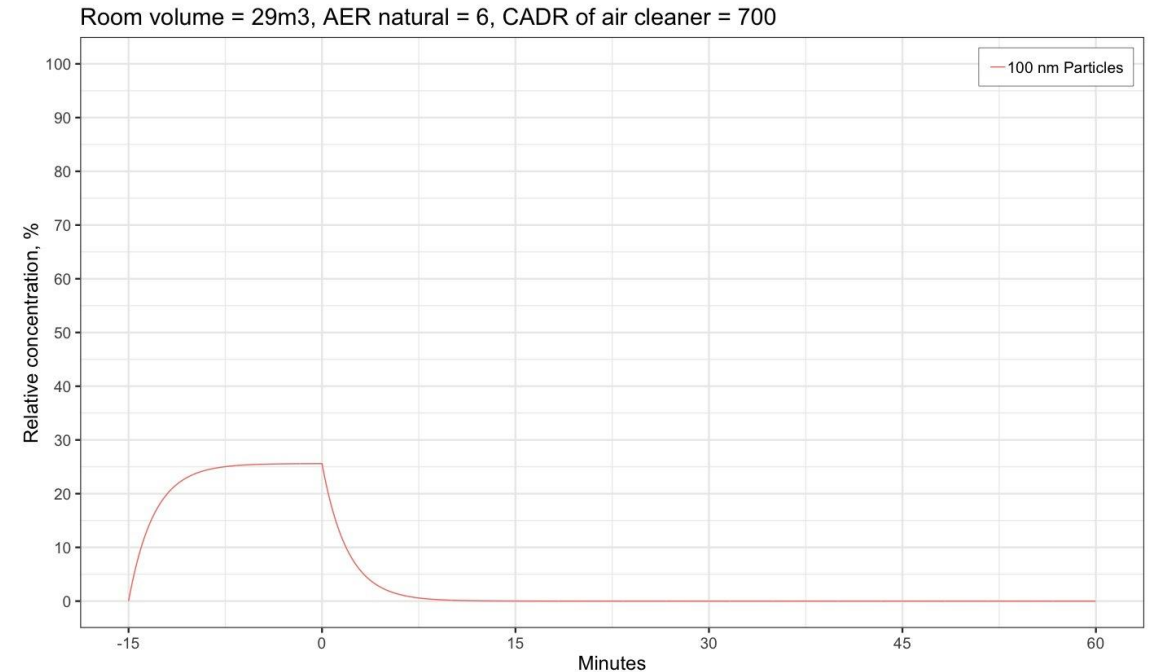
WHO Data

# What does this mean?

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## With air cleaning

- AirHavn Pro constantly running
- Asymptomatic patient enters room
- Concentration of virus particles rises to 26% and is maintained
- 15 minute procedure
- Patient leaves room at time “0”
- Room cleaned to 0.25% by **9 mins 12 seconds**





# Patient Throughput

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No air cleaning - 6 ACH - 6 patients / day



705 m<sup>3</sup>/hr CADR - 24 ACH - 20 patients / day



1,150 m<sup>3</sup>/hr CADR - 40 ACH - 23 patients / day



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