

# Buildings as first lever of environmental medicine

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10 OCTOBER 2019

**HEALTHY  
BUILDINGS  
DAY**

# Buildings, first human environment



- by its proximity
- by the time spent

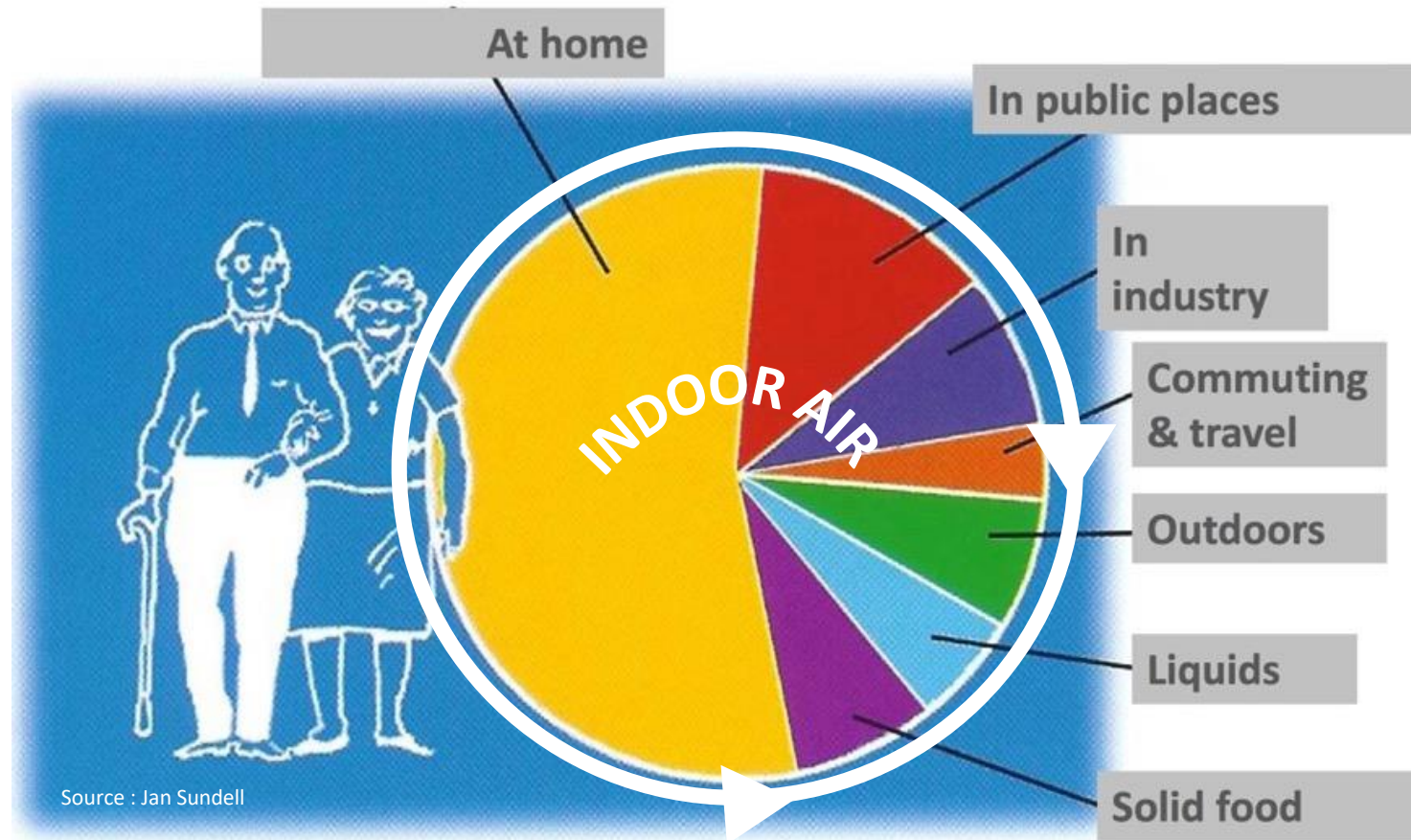
On average, a day

- 20 h in confined spaces
- 16 h at home
- 9.30 h in the bedroom

*Source: OQAI. National French Campaign Housing*



# Indoor air, first contribution to human exposures



# How does the building influence health?





# Air, key figures



**3**  
minutes  
without breathing

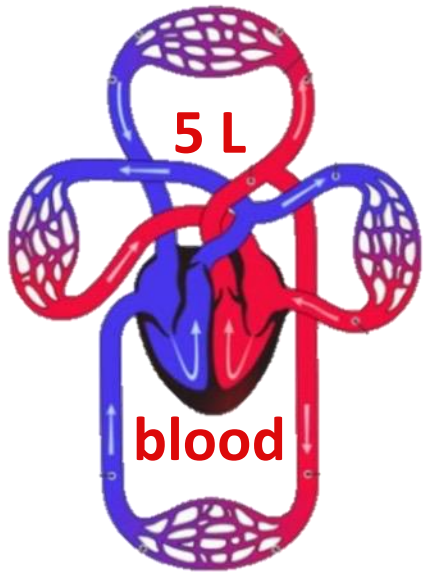
**3**  
days  
without drinking

**30**  
days  
without eating

**100 %**  
of the time

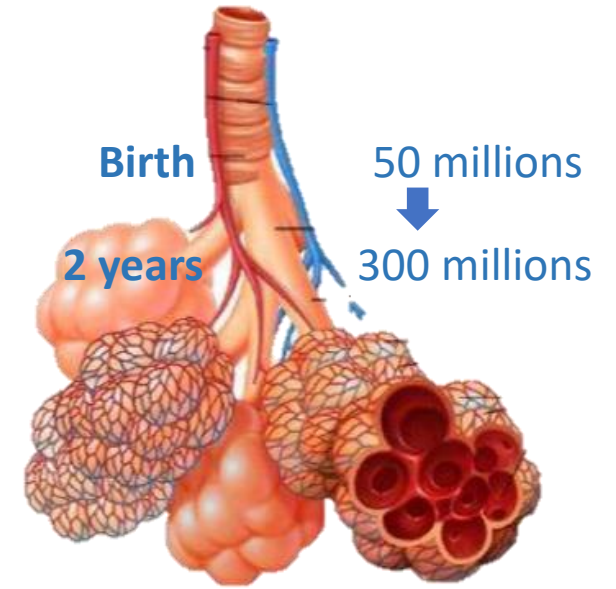
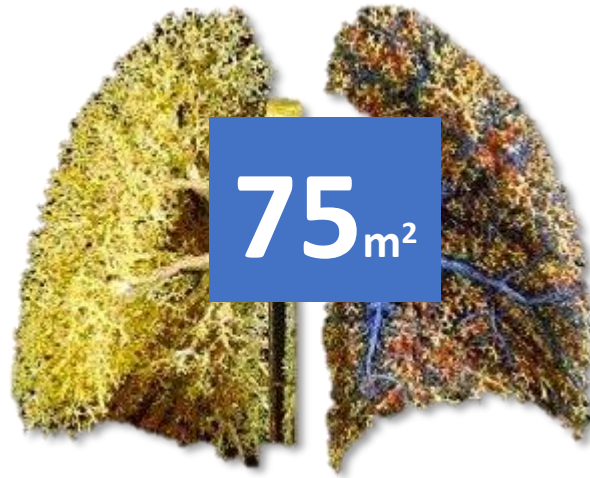
**15 000** l/d

**6** l/minute



**1** min

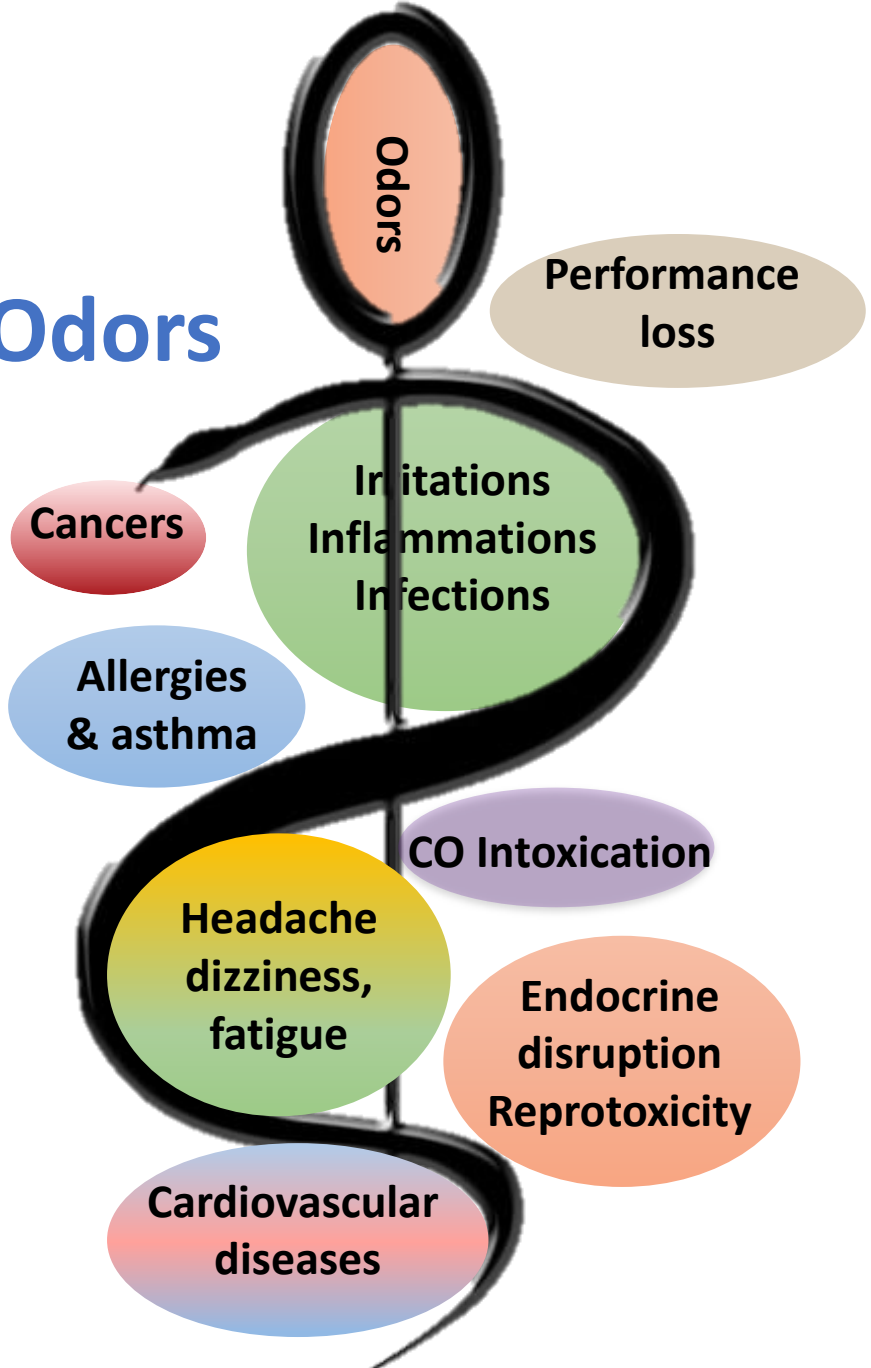
Whole blood  
volume goes  
into lungs





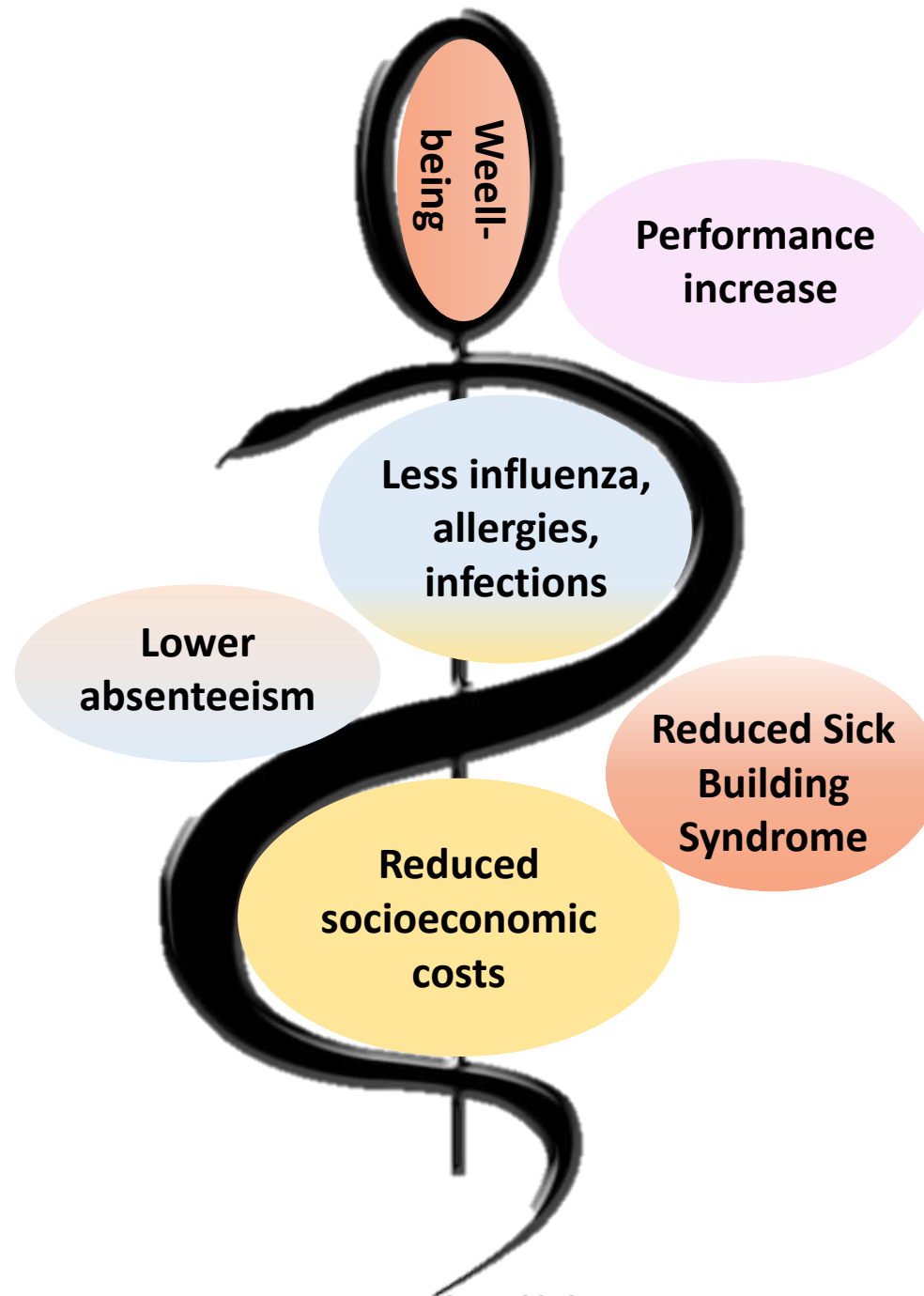
## Odors

## Various disorders





**Well-being  
at home,  
at school,  
in the office**



# Daylight benefits



## VISUAL EFFECTS

- Visibility
- Activity
- Colors
- Security



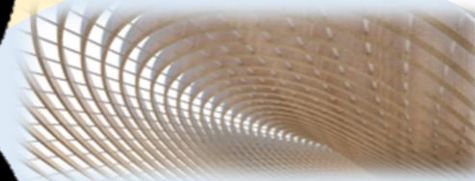
## NON VISUAL EFFECTS

- Circadian rhythms
- Hormones *melatonin /cortisol*
- Behaviors *mood /vigilance*
- Aesthetic pleasure



## ÉCONOMIE

- Installation
- Maintenance
- Energy
- Environment



## ARCHITECTURE

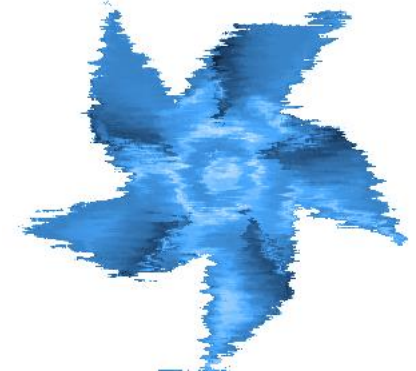
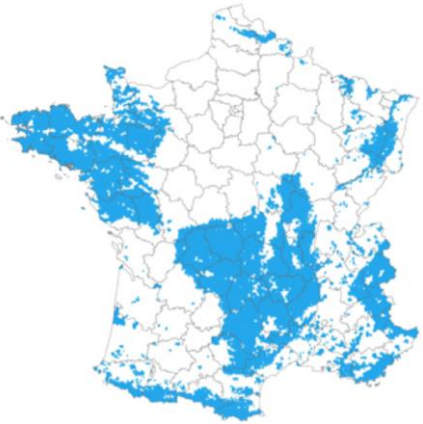
- Form
- Composition
- Style
- Codes and standards





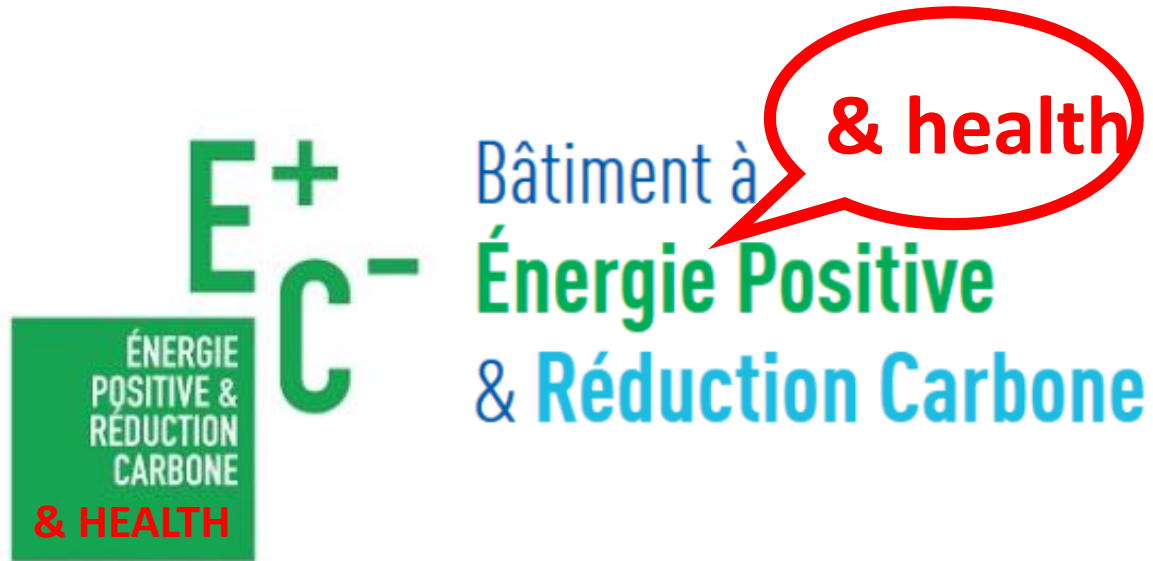
# The challenges to overcome ?

Favour a global building design approach... for human well-being



# The challenges to overcome ?

Favour a global approach in regulations... for human well-being



# Thank you for your attention

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# What are the easiest ways to make a building healthier?

## ► Good practices



- **Building envelope that creates good daylight environments**

daylight, transparency, fluidity of spaces – to favour daylight penetration essential for our biorhythms, meetings between buildings occupants, and communication

- **Active Design** : bring daylight into staircases, corridors, all circulation areas to boost physical activity, exchanges in a warm atmosphere

- **Reduce air pollution sources**

Outdoor air filtration, reduce radon transfer, choose building and decoration components with low emission of pollutants

- **Ensure efficient air renewal conditions**

- At building delivery, 68 % of mechanical ventilation systems of individual houses do not comply with the regulation

*(CETE 2012. JOBERT R. Analyse qualitative et technique des dysfonctionnements.)*

- 10-15mn windows opening cause CO<sub>2</sub> levels to drop by 50 % and VOC content to be divided by 4 after a polluted activity.

