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# Empowering women to take action against energy poverty in the Mediterranean HEALTH Training

# Preamble for the trainers

- This is a training for local key actors (social actors for example)
- It’s more meant to explain the problem that the households you follow can encounter.

- For households, we don’t speak about energy poverty, we need more illustrated content related to their situations

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SERVING SOCIETY TOWARDS SUSTAINABILITY

# Content

1. Energy poverty: definition
2. Energy poverty: causes and consequences
3. Most vulnerable groups and gender inequality
4. Energy poverty impact on social determinants of health
   4.1 Thermal feeling
   4.2 Indoor air quality: humidity, carbon monoxide
   4.3 Physiological stress
5. Energy poverty and health
6. Thermal (dis-)comfort and gender
7. Act against energy poverty
8. Benefits for well being
9. Possible measures
10. Literature

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# Do you know the energy source providing your household?

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Where are energy poverty and health/well-being issues coming together?

Is there a difference between the seasons?

# 1. What is energy poverty?

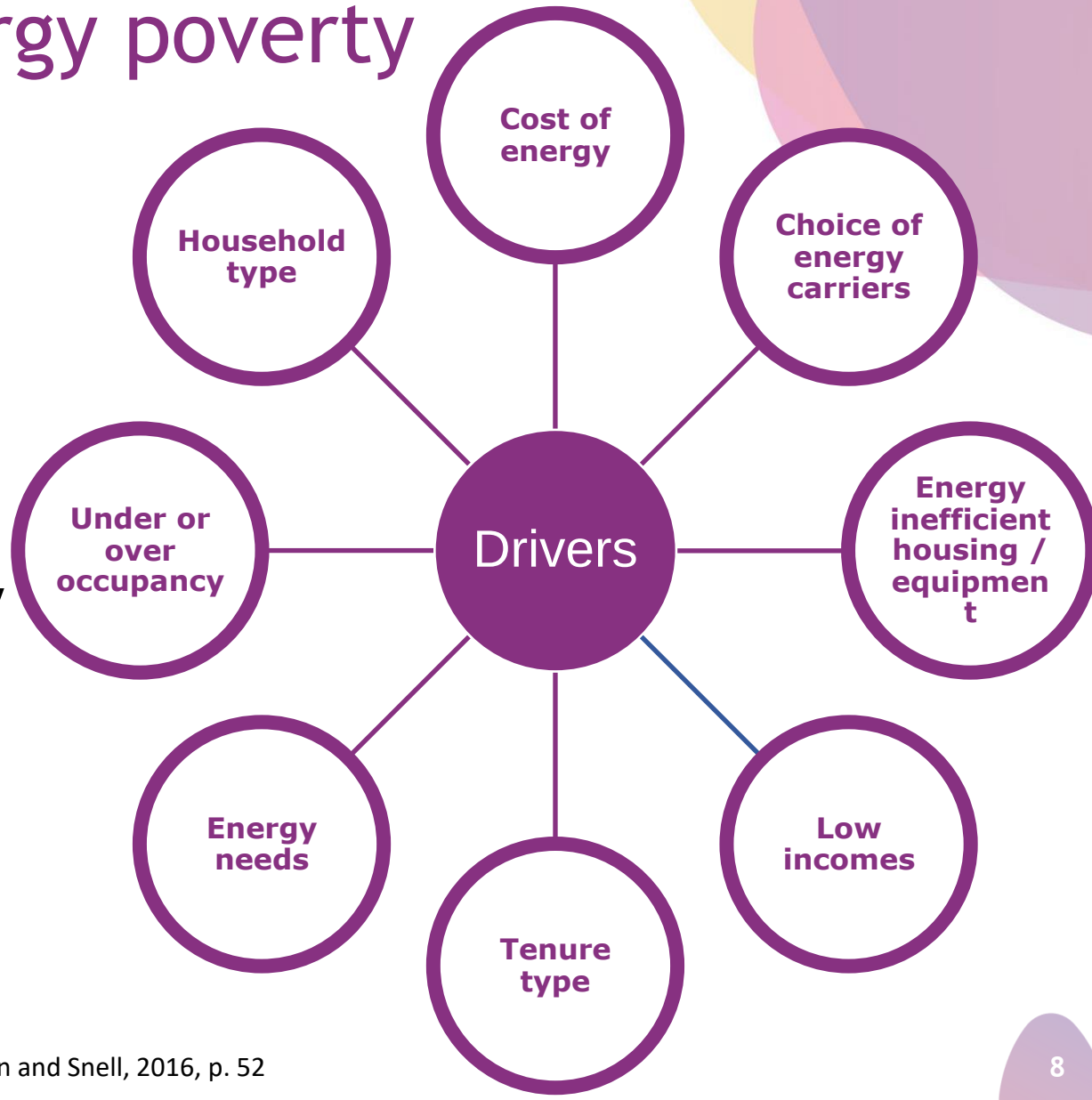
- Energy poverty can be seen as a situation in which a household lacks a socially and materially necessitated level of energy services in the home

- Energy poor households experience inadequate levels of essential energy services, due to a combination of high energy expenditure, low household incomes, inefficient buildings and appliances, and specific household energy needs

# 2. Causes of Energy poverty

Key factors, which are often closely related with each other:

- Low income, which is often linked to general poverty
- High energy prices, including the use of relatively expensive fuel sources (depending on the country energy structure it can be electricity domestic fuel…)
- Poor energy efficiency of a home, e.g. through low levels of insulation and old or inefficient heating systems or appliances




Source: Thomson and Snell, 2016, p. 52

# 2. Consequences of Energy Poverty

## Financial Consequences:

- Indebtedness and loans
- Use of budget usually needed for other important needs such as housing, food, education
- Creation of restriction mechanisms or deprivation leading to other consequences
- Use of aids and other assistance mechanisms

## Consequences due to technical restrictions in heating:

- Under-heated houses will be humid
- Under-ventilated houses will be humid and unhealthy
- Humid houses will result in deterioration and enabling the development of mould, which leads to unsanitary conditions

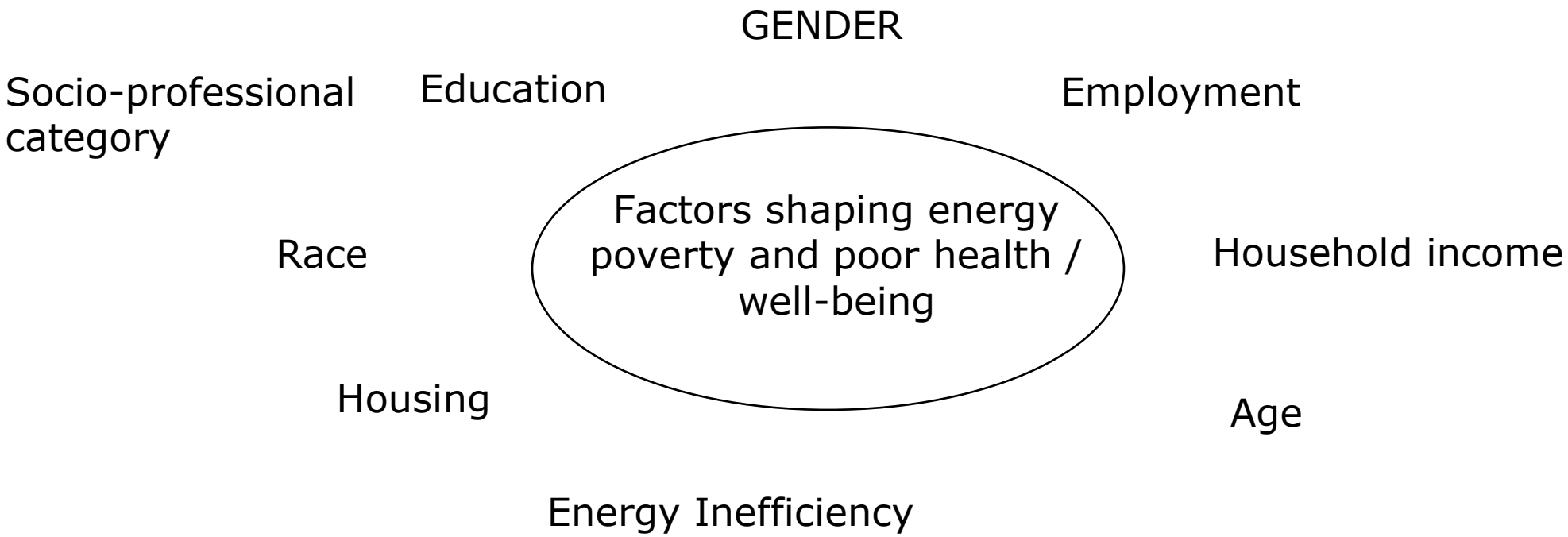
# 3. Most vulnerable groups

- Elderly (pensioners), mainly women
- Single parent households, mainly single mothers
- Low income households, unemployed or employed people but at a risk of poverty, mainly women:
- Person with long-term illness
- Children

# 3. Gender focus

- Due to labour division, women tend to spend more time working at home and thus are more exposed to energy poverty and inefficiencies
- Single parents are most affected group - in EU ca. 85% of single parents are female --> well-being can be affected due to financial and psychosocial burdens
- *Respiratory illness from solid fuel cooking is one of the greatest causes of premature mortality globally*

# 3. Synthesis of vulnerability factors



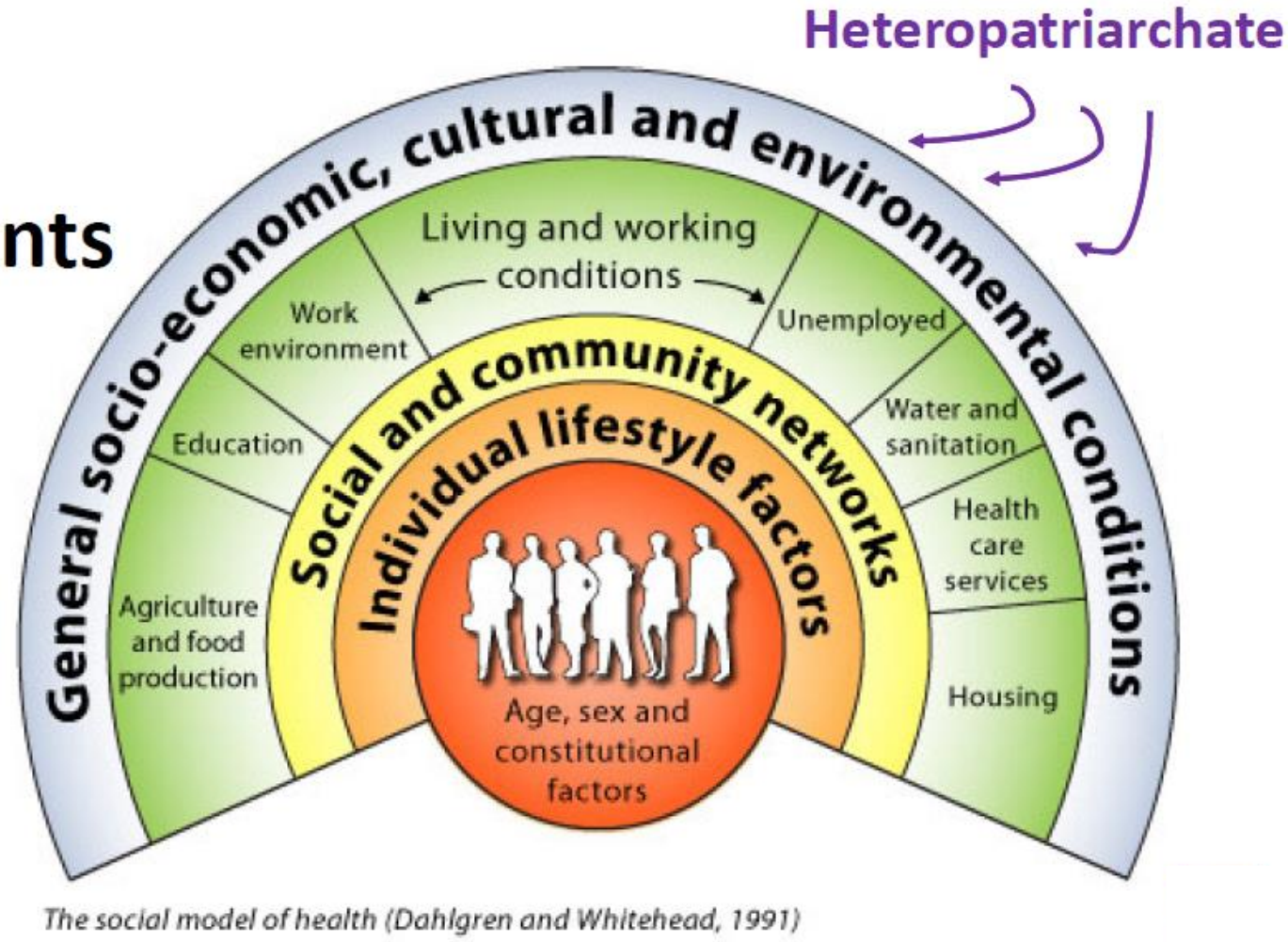

Source: Jessel et al. 2019

# 4. What is Health?

- Health is **a state of complete physical, mental and social well-being** and not merely the absence of disease or infirmity (WHO)
- Depends on the distribution of power, money and resources at the global, national and local levels --> Health inequalities

# 4. Health determinants

**Main determinants of health**




*The social model of health (Dahlgren and Whitehead, 1991)*

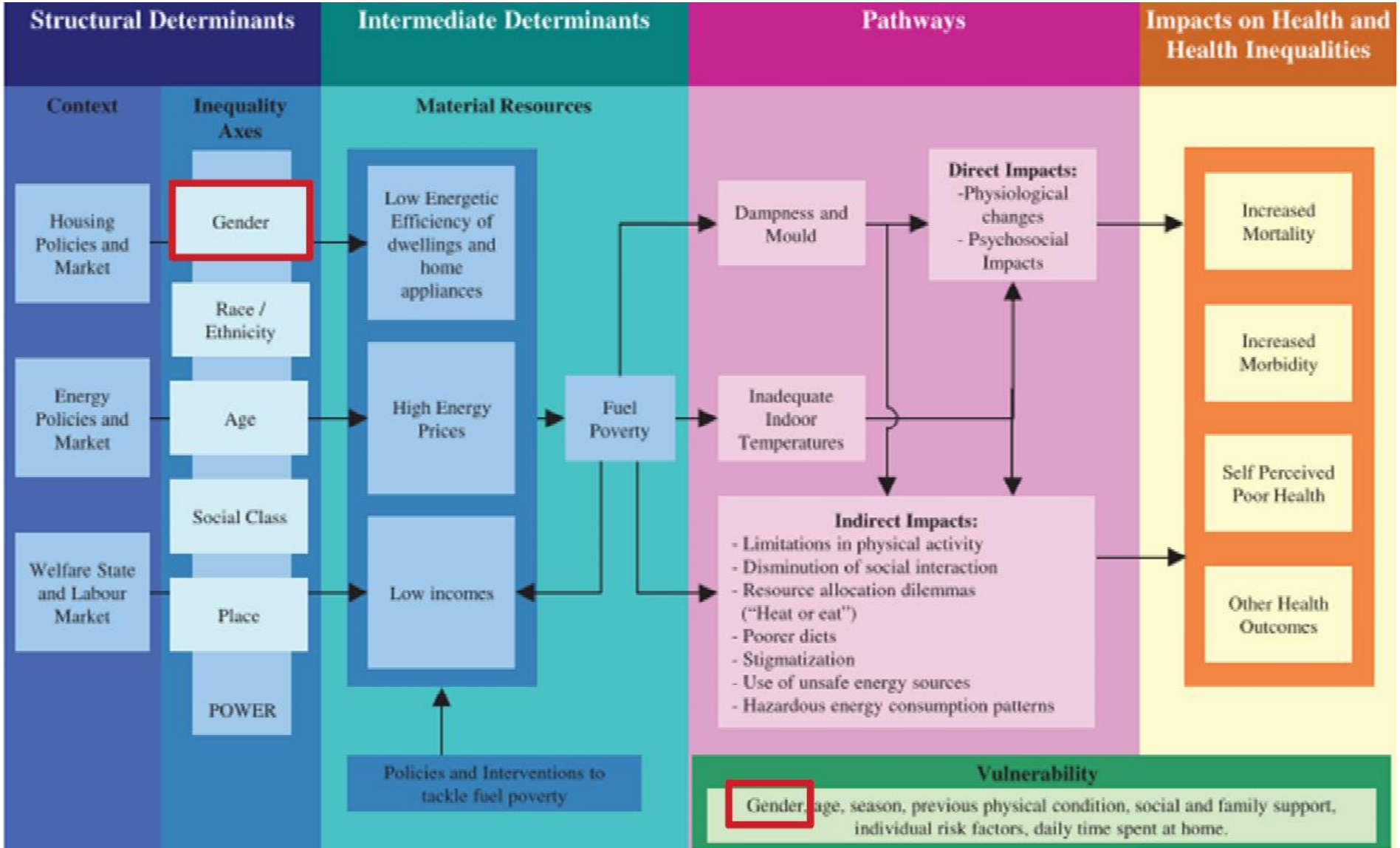
# 4. Health determinants

# 4. Impact of energy poverty on the social determinants of health

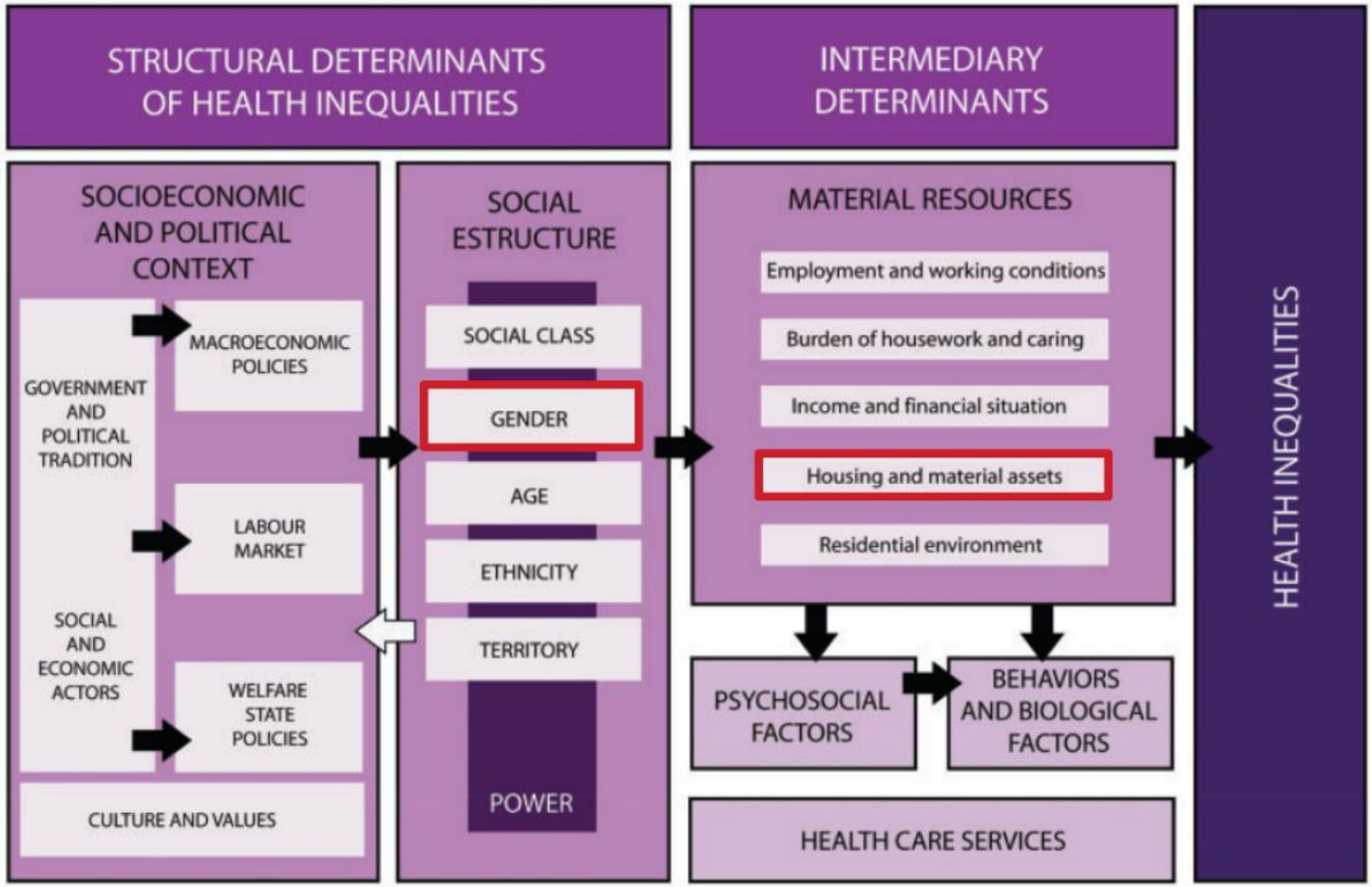
What are the social and environmental determinants of health in link with energy poverty:

- Global context: energy policies, social policies, climate change
- Systems: health and social services systems, housing assistance systems, energy programs (type of energy, building renovation, etc.)
- Living environments: housing / work / family environment
- Individual characteristics: socioeconomic characteristics and lifestyle

# 4. Impact of energy poverty on the social determinants of health



# 4. Impact of energy poverty on the social determinants of health



# 4. Impact of energy poverty on the social determinants of health

## Global context:

- Climate change will accentuate cold phenomena and heat waves
- Ecological and energy transition => get out of fossil fuels; What cost of energy to come? What kind of energy to come?

## Living environments:

- Work: energy poverty will impact work (economic cost and comfort for working from home)
- Housing: degradation of the housing conditions:
  - dwelling too cold and not sufficiently ventilated: mould/ unsanitary housing
  - Use of improper heating modes
  - Lower indoor air quality
  - And dwelling too hot in summer
- Social fabric: increased social isolation and stigmatisation

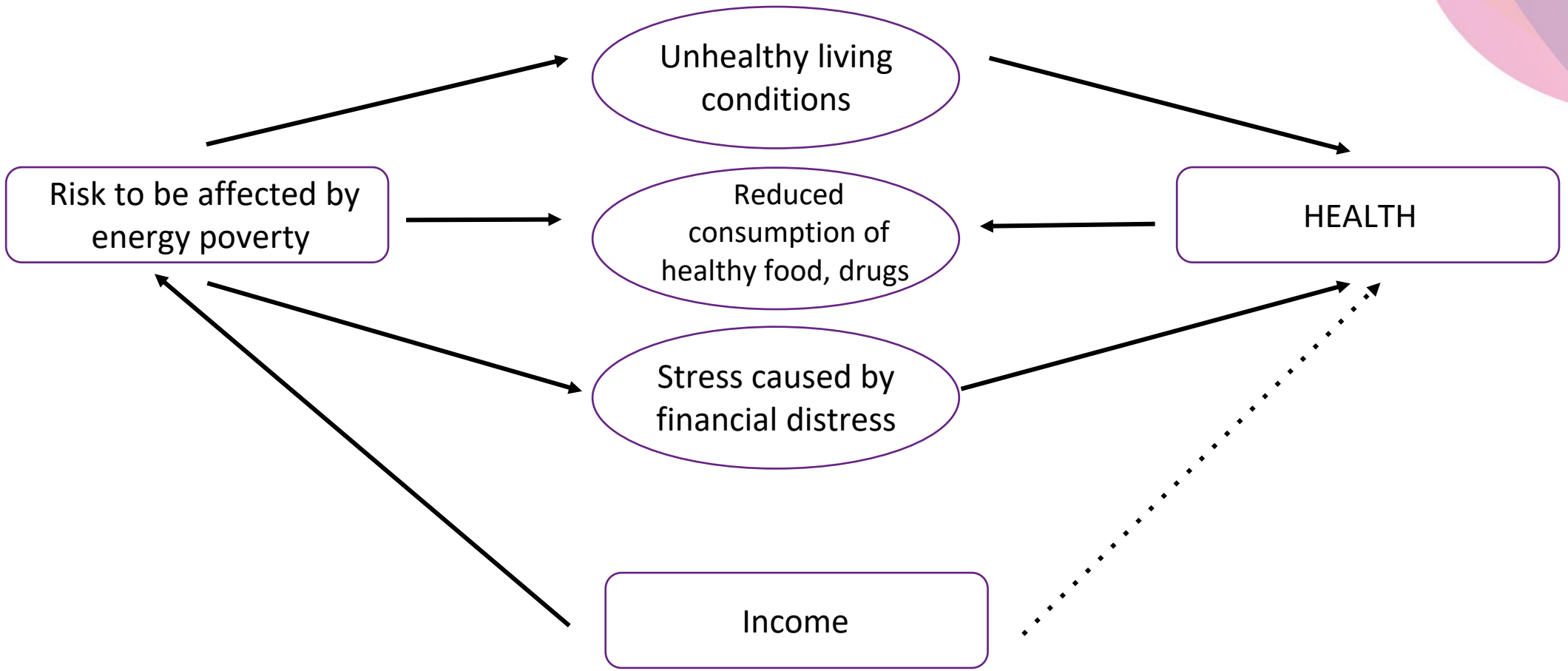
# 4. Impact of energy poverty on the social determinants of health

## Individual characteristics

Socio-economic conditions and impacts on daily life and consumption habits:

- Indebtedness and loans
- Use of budget usually needed for other important needs such as housing, food, education
- Creation of restriction mechanisms or deprivation leading to other consequences
- Use of aids and other assistance mechanisms
- physiological consequences and increasing diseases

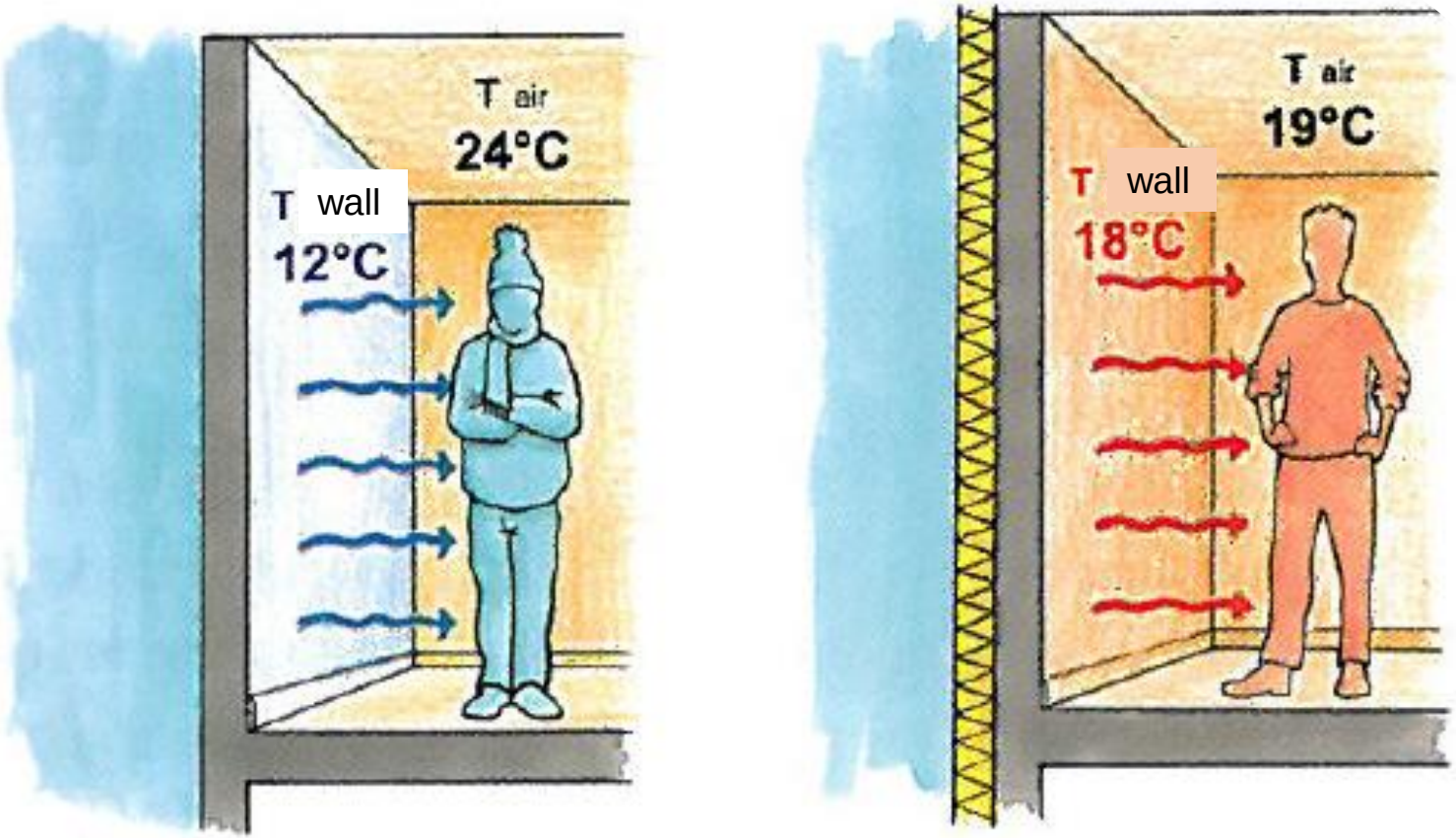
# 4. Energy Poverty and Health



# 4. Consequences of Energy Poverty on health

| Physical health | Mental health | Social health |
| --- | --- | --- |
| • Increase in winter infections (colds, flu, etc.)<br>• Increase in cardiovascular disease<br>• Increase in respiratory diseases<br>• Increased poisoning | • Increased stress<br>• Decreased sense of well-being and comfort<br>• Depression | • Hinder normal functioning in everday areas such as work or study<br>• Decrease in social relations<br>• Risk of stigmatising |

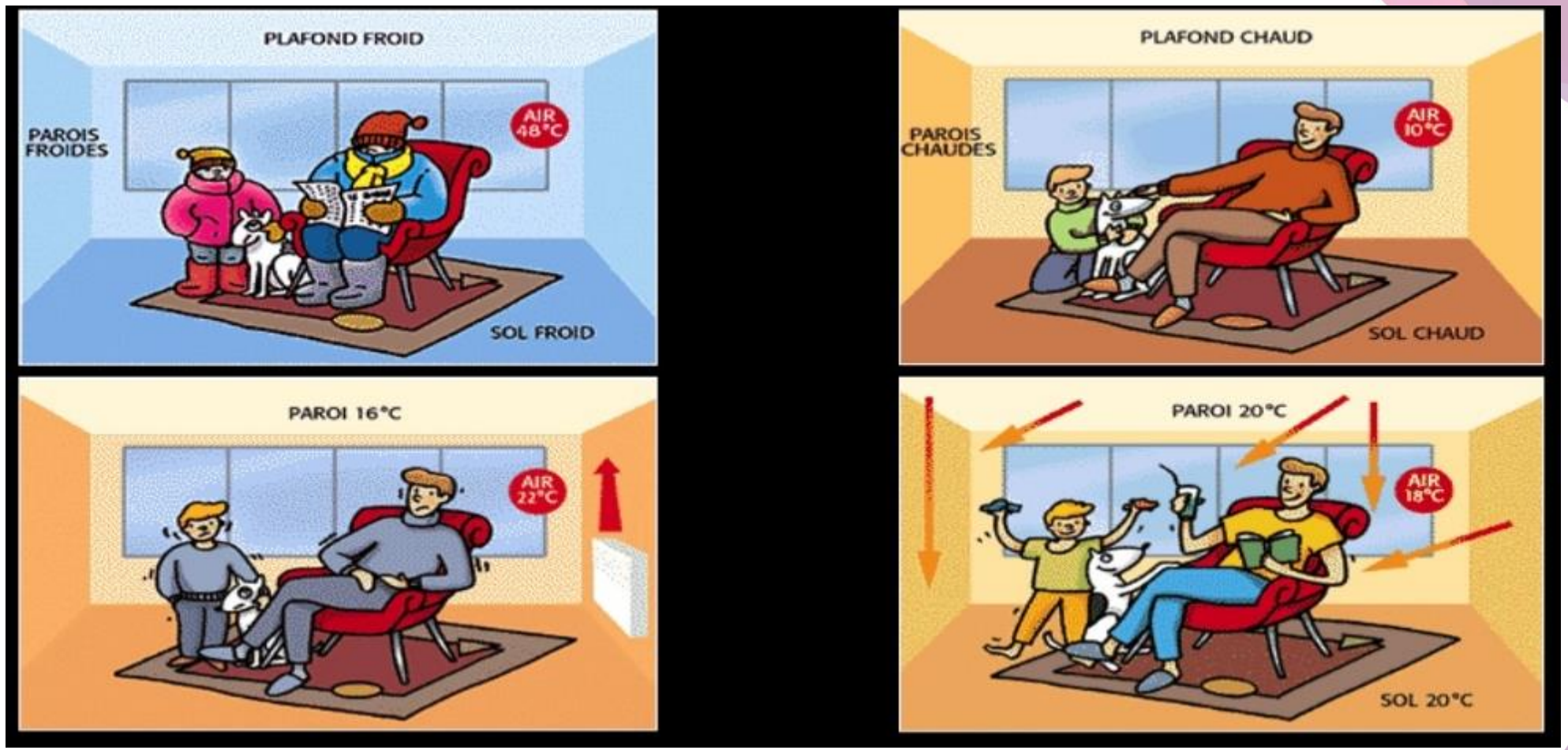
# 4.1 Thermal feeling – “perceived temperature”




Mean radiant temperature ( = $\frac{\text{wall temperature + room temperature}}{2}$)

# 4.1 Thermal feeling – “perceived temperature”

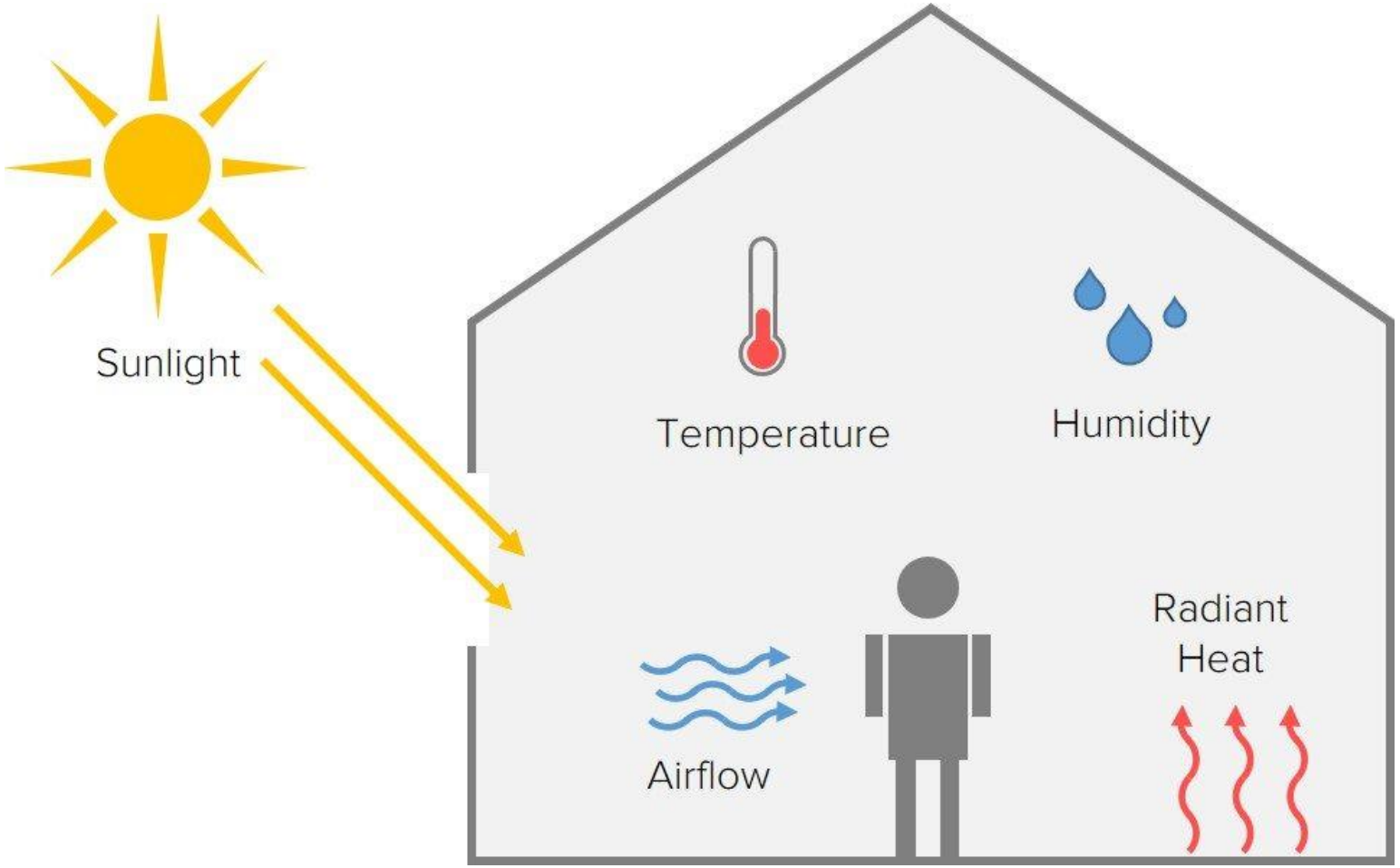
The wall temperature is of high Importance




Experiment implemented by the Massachussetts Institut of Technology

Source: www.promodul.org

# 4.1 Thermal comfort parameters



# 4.2 Indoor air quality


**Chemical pollutants**

- Organic volatile compounds
- Phtalates
- Nitrogen oxyde (NOx)
- Carbon monoxyde (CO)
- Carbon dioxyde (Co2)

**Physical pollutants**

- Radon
- Asbestos…

**Bioligical pollutants**

- mould
- Allergens (dust mites,  pollens, etc.)

Indoor air is collecting outdoor and / or indoor air pollutants because of
Lower air volume
Higher concentration of pollutants

Temperate climate: we spend around 85% of the time indoors

# 4.2 Indoor air quality: $CO_2$ rate

$CO_2$ concentration = air containment indicator

CO2 rate depends on human occupation and air renewal

Available epidemiological data do not allow the construction of a threshold value for CO2 protecting the effects of confinement on health
Recent study suggests an impact on psychomotor performance at 1000 ppm
France - VGAI*

Impact of a high concentration of CO2: decrease in psychomotor performance (decision making, problem solving, concentration)

# 4.2 Indoor air quality: humidity level, ventilation and temperature

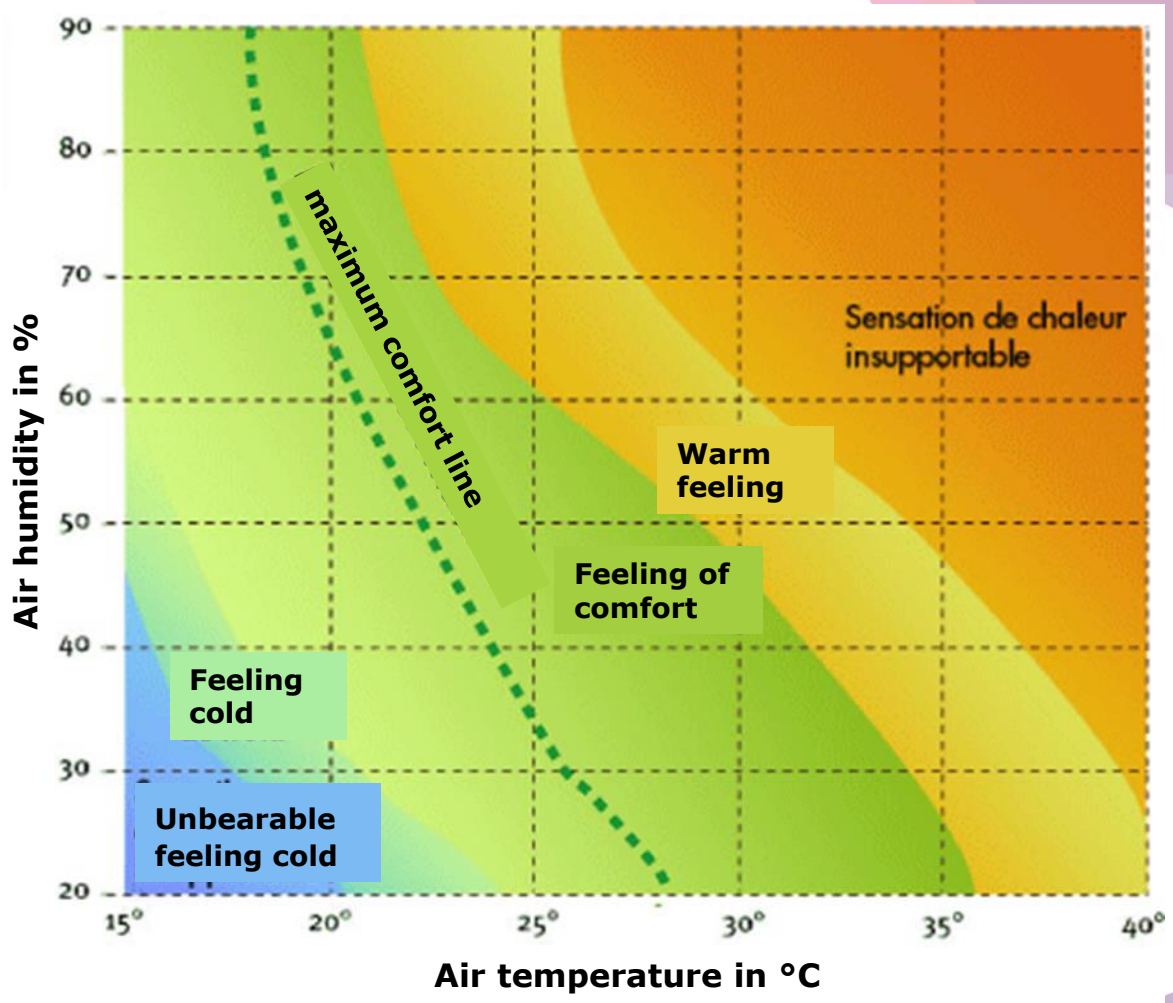
Recommended room temperature: 19°C:20°C

Good ventiliation

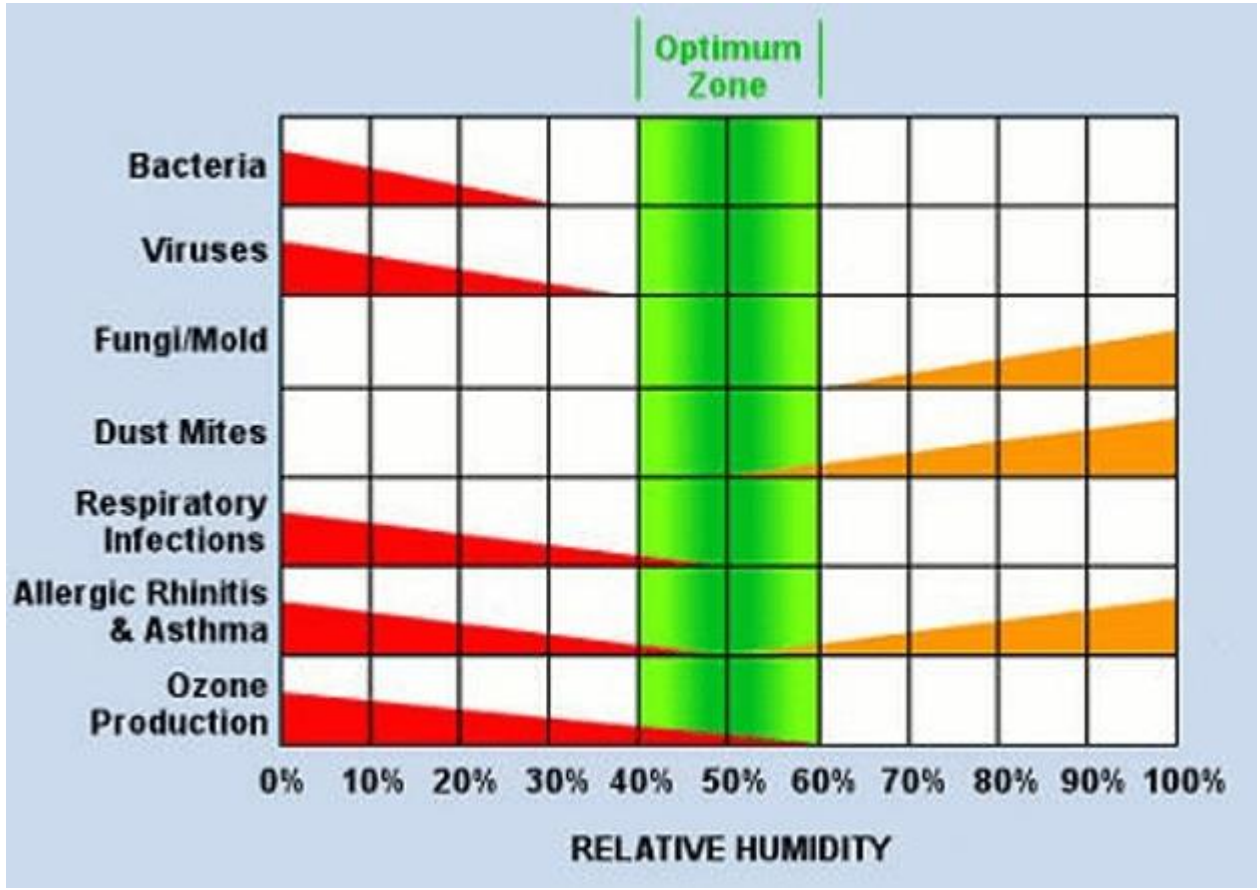
Good indoor air quality

Optimal humidity: between 40% et 60%

Good airing



# 4.2 Indoor air quality: humidity level, ventilation and temperature




Impact of temperature and humidity on biological pollutants and related biomedical infections

# 4.2 Indoor air quality: risk of carbon monoxide poisoning due to heating systems

- Carbon Monoxide is the result of incomplete combustion and regardless of the fuel used, wood, butane, coal, gasoline, fuel oil, natural gas, oil, propane. The bad combustion is due to a lack of oxygen in the room (not well airy) and/or to a defective equipment
- combined with poor ventilation, carbon monoxide stagnates in the room
- Carbon monoxide inhalation can quickly lead to "cognitive decline, headaches, nausea, and dizziness"  (Jessel 2019) and "risks of intoxication, poisoning, and even death" (IDEA 2017)

# 4.2 Energy Technology and indoor air quality

- "**Unvented gas heaters [and generators**] … are associated with increased levels of nitrogen dioxide (NO2) and volatile organic compounds (VOC), which exacerbate allergies and respiratory illness symptoms, create ear, nose, and throat irrigation, and contribute to cognitive delays" (Jessel 2019)
- Unvented oil heaters also

# 4.3 Cold stress - Physiological stress

- Cold stress occurs by driving down the skin temperature, and eventually the internal body temperature
- In a cold environment, most of the body's energy is used to keep the internal core temperature warm
- Over time, the body will begin to shift blood flow from the extremities (hands, feet, arms, and legs) and outer skin to the core (chest and abdomen)
- When the body is unable to warm itself, serious cold-related illnesses and injuries may occur, and permanent tissue damage and death may result
- Four factors contribute to cold stress: cold temperatures, high or cold wind, dampness and cold water

# 4.3 Heat Stress - physiological stress

- Heat stress occurs when the body cannot get rid of excessive heat
- The body reacts by increasing the blood flow to the skin’s surface, and by sweating,  the body's core temperature rises and the heart rate increases
- As the body continues to store heat, the person begins to lose concentration and has difficulty focusing on a task, may become irritable or sick, and often loses the desire to drink. The next stage is most often fainting and even death if the person is not cooled down

# 4.3 Psychological consequences

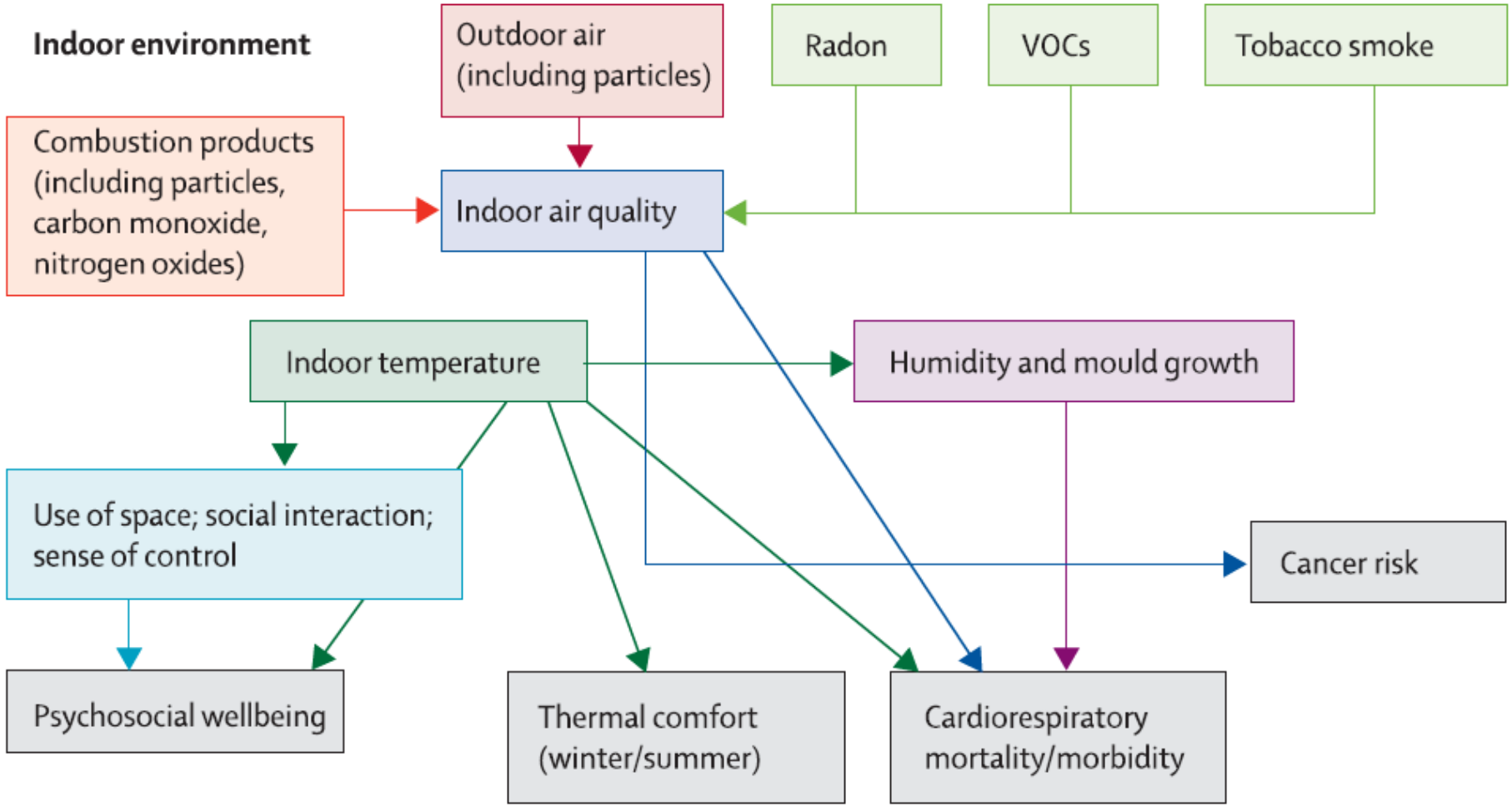
## DIRECT

- Chronic temperature-related discomfort

## INDIRECT

- Depression
- Worry that cold will harm physical health, especially in households with children
- Spatial reduction and stress from living in just one or two rooms that can be heated inexpensively
- Stigmatization within the community
- Lack of a solution or lack of control over the problem
- Social isolation

# Short synthesis of indoor conditions and health conditions




Source: IREC

# 5. Energy Poverty and Health

- 'Energy poor population is more likely to report poor health and emotional well-being than non-energy poor population' (Thomson et al. 2017)

A review by the Barcelona Public Health Agency show that:

- Social groups suffering most from energy poverty (low-income, renters, elderly) can attain more health benefits (through improving health determinants) but experience more barriers for undertaking a housing retrofitting.
- The inequality dimensions described most in the literature are socioeconomic position, housing ownership status and age. There are very **few mentions of other relevant inequality dimensions** like gender, ethnicity or migratory status.

# 5. Poor health

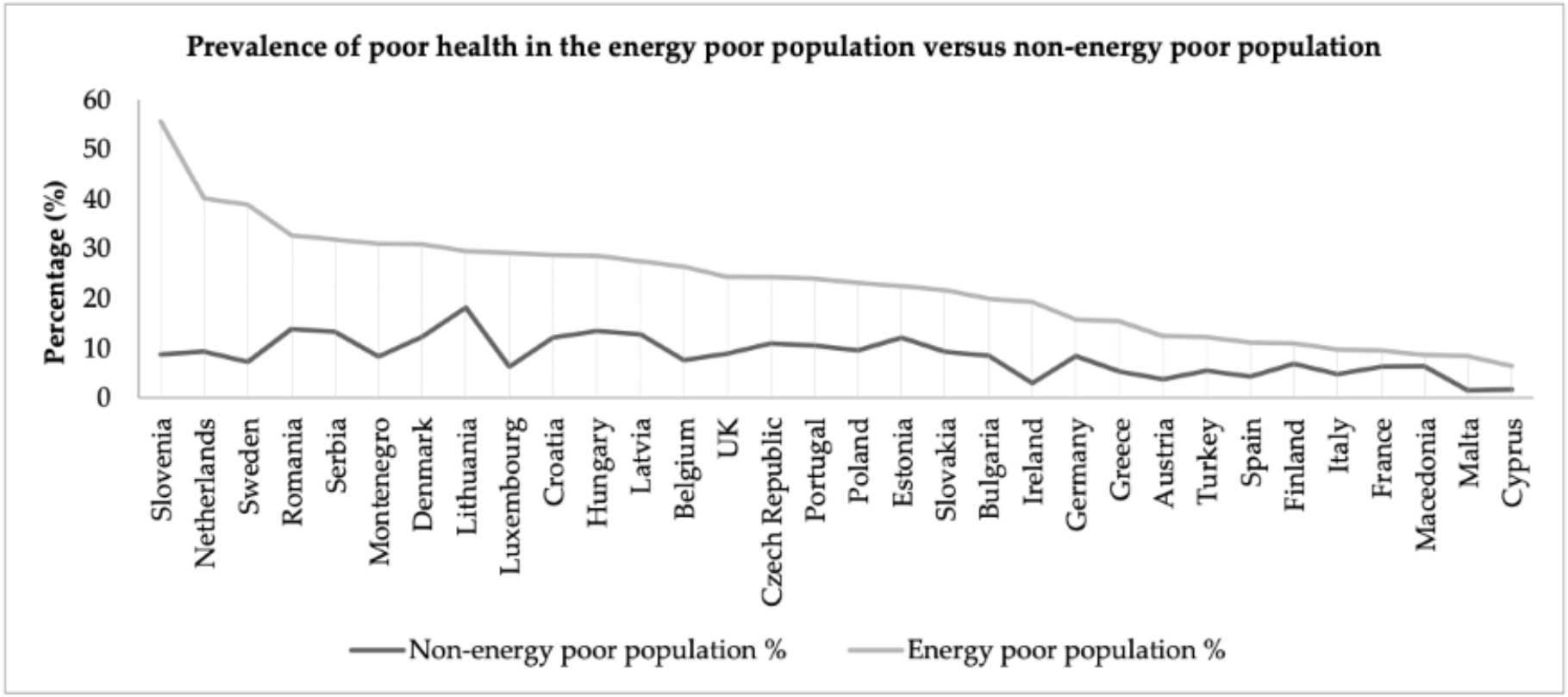
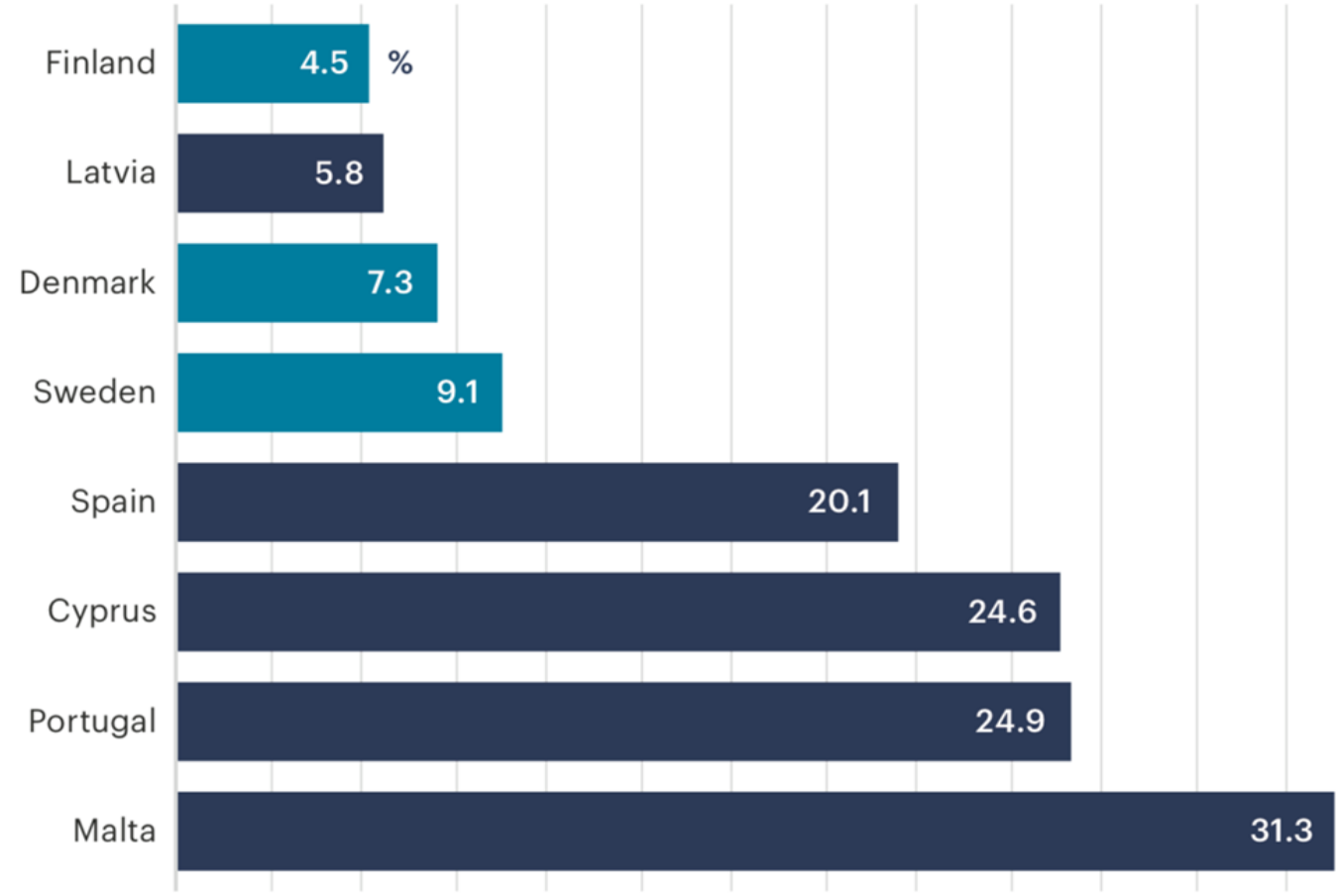



**Figure 1.** Line graph showing the prevalence of poor health among the energy poor and non-energy poor populations across 32 European countries.

Source: Thomson et al. 2017

# 5.Excess winter deaths concentrated in EU's warmest /coldest countries




While much attention has been focused on excess winter deaths in cold, northern countries, the data reveal a different story.

The highest rates of excess winter deaths are actually found in the warmest countries, where people are more likely to live in inadequate buildings or lack access to heating that would support thermal comfort.[13]

Again, there is a link to GDP and average incomes.

- GDP above the EU average
- GDP below the EU average

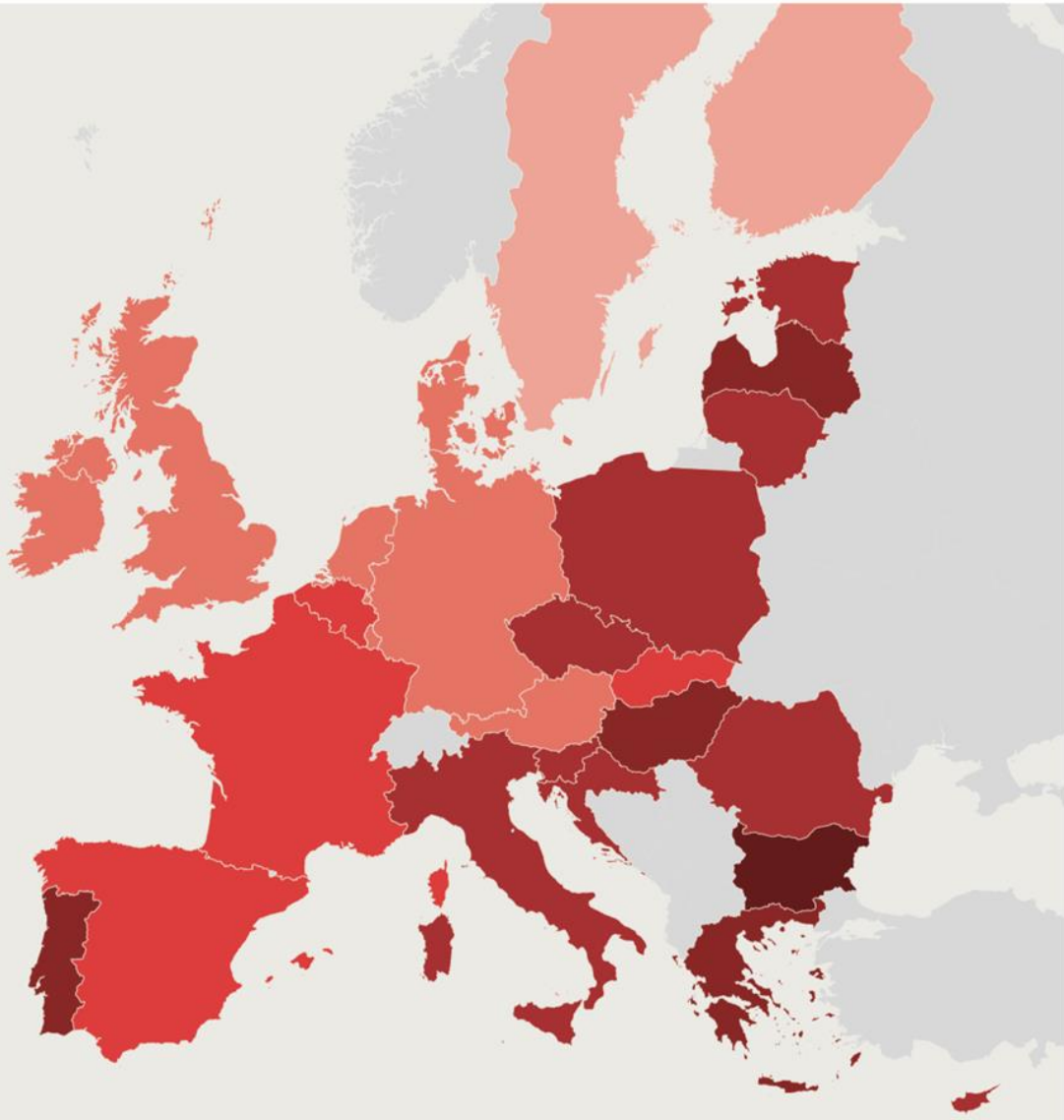
Source: EU Building Observatory, 2014.

# 5.Exposing the Impacts of Summer Heat

Across south-eastern Europe, as well as in the Baltic states, staying cool in summer is a significant challenge. In the period 2006-12, a staggering 25% of Spanish households (7 million people) reported not being able to afford cooling in summer.[4] In 2010, premature deaths linked to energy poverty surpassed the number of fatalities from car accidents in Spain.[5] Other countries particularly affected include Italy, Greece, Cyprus, Bulgaria and Malta.

Share of low-income families unable to stay cool in summer.

0% 100%



Source: Eurostat, 2012.

# 6. Thermal (dis)comfort and gender: physical differences between males and females

- Females more likely to express dissatisfaction than males in the same thermal environments, especially in cooler conditions
- Females are more sensitive than males to a deviation from an optimal temperature
- Women have a greater need for individual temperature control and adaptive actions than men
- The male body by nature has a higher muscle mass, which protects them from freezing
- Female bodies only have about 70 percent of the sweat glands that males have, and in relation to their overall body weight they would have a larger surface area than men, through which they emit more heat and therefore freeze more easily

# 7. Act against Energy poverty for a better health

The choice of relevant practical measures are to be done in link with households needs:

Airing, ventilation system improvement, reduced use of mobile heating systems, insulation, heating system improvement or replacement, global retrofitting measures, sun shading , ceiling fans etc.

One conclusion of Sophie EU-project tells us that the impact of energy efficiency interventions in public housing buildings on cold-related mortality: a case-crossover analysis

- The intervention reduced the risk of death associated with extreme cold in women.
- The effect was greatest for circulatory system causes, women with no education and in those aged 75 or older

# 7. Indoor air quality improvement: airing and ventilation

Air renewal = decrease in the concentration of pollutants and the humidity rate

## Airing

- 10 minutes a day, windows wide open
- During activities increasing humidity or emitting pollutants (household, kitchen, DIY, shower, etc.)
- Remember to turn off or turn down the heating systems during airing

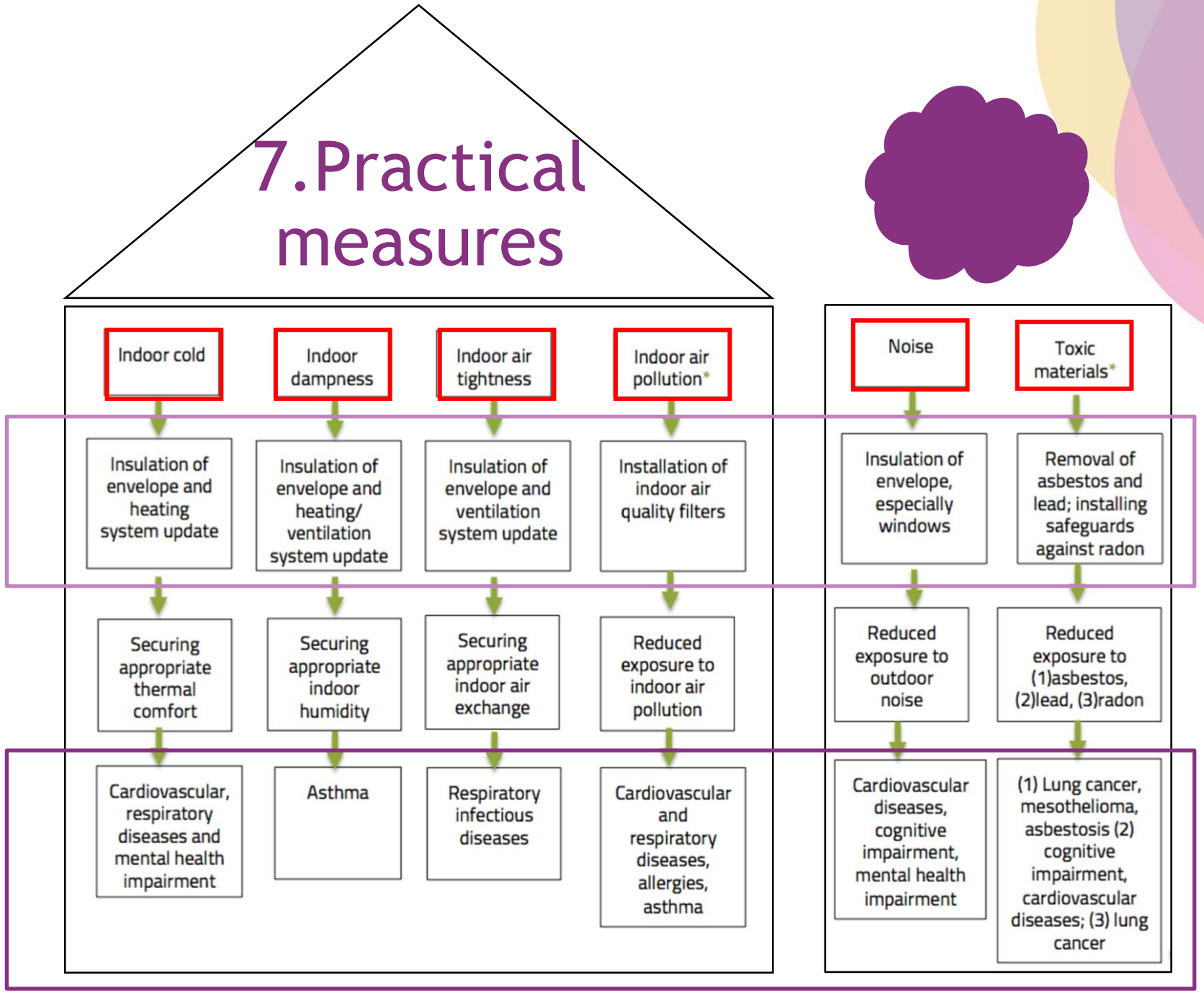
## Ventilation

- Does not replace airing
  It is an air renewal system by general and permanent circulation
- Natural: no mechanical system, fresh air inlet and polluted air outlet (vents and ventilation grilles)
  - Mechanical: an electrical system (fan) forces a continuous air renewal.
- Do not block the ventilation grilles, do not cut off the mechanical ventilation, regularly dust the grilles and have your mechanical ventilation checked every 3 years by a specialist

# 7.Practical measures

Practical measures

Health improvement

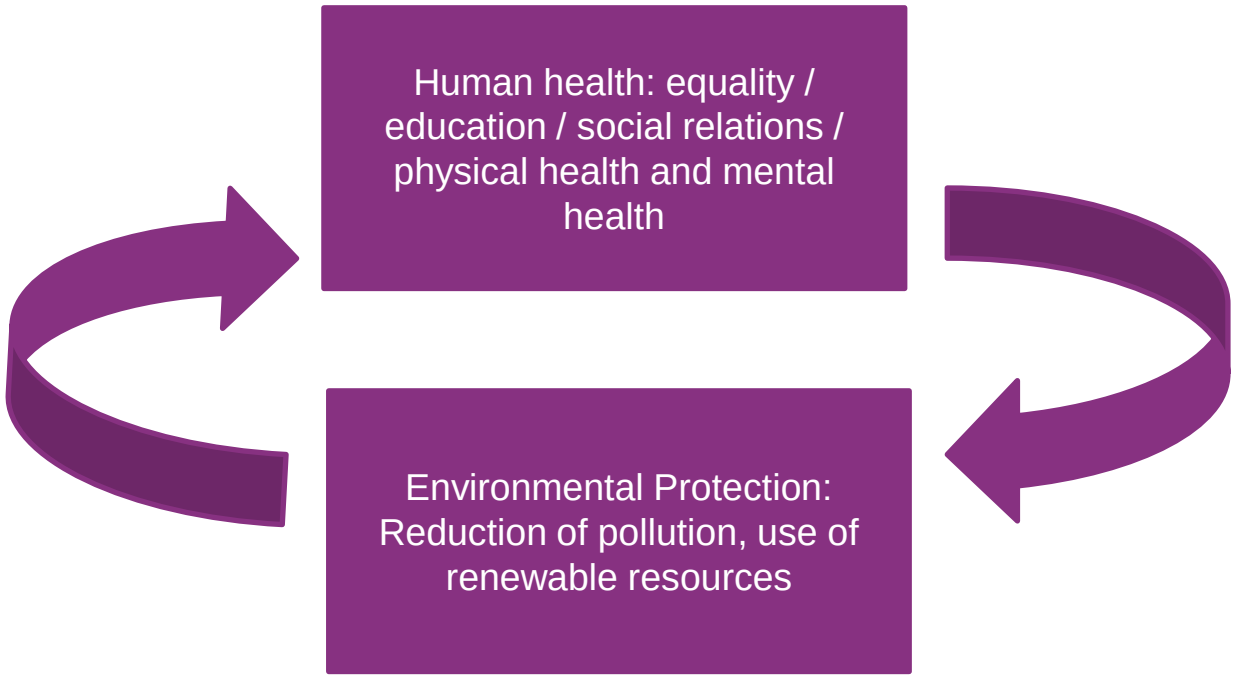


# 8.Benefits for well-being through access to energy efficiency and decentralized energy

- Through higher energy efficiency of households, people have more energy, can move and sleep better, go to the doctor less, feel less anxious and children have reduced absenteeism at school
- Affordable and clean energy services are a crucial input to supporting the provision of basic needs such as food, lighting, use of appliances, water, sanitation, essential health care, education, communication and transport
- Energy efficiency facilitates greater economic productivity and provides social and environmental benefits, including increased energy affordability, improved air quality, reduced pollution and global climate change mitigation

# 8. Benefits for well-being through access to energy efficiency and decentralized energy

## Energy efficiency and decentralised energy



# 9. Looking forward: Possible Measures against Energy Poverty

- Reducing energy poverty can increase equality within a society
- Investment in energy efficiency schemes should be prioritised for energy poor households, in order to potentially realise reductions to public expenditure on health care' (Thomson et al. 2017)
- National energy advising network: free-of-charge energy advising for households
- Rapid and adequate adjustment of social systems is required. The effects of the energy transition in the form of increased energy costs must be adequately taken into account (CARITAS 2013)
- Increased tax financing for energy transition related expenditure
- More gender specific data is needed to assess Nexus

# 10. Literature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THANK YOU !

# EmpowerMed

## www.empowermed.eu

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