# Why healthy housing?

For many years, the housing environment has been acknowledged as one of the main settings that affect human health. The buildings in which we live, the neighbourhoods in which they are situated, and the regions to which they are linked determine, for example, the quality of our indoor air, the access we have to healthy foods, recreation facilities, and gainful employment. Much of our everyday lives, and hence our health, are associated with the condition, design, and location of the place where we reside.

Housing construction, maintenance, where houses are located (access to services) and how they are occupied, all have an impact on the health and wellbeing of the occupants and are appropriate targets for policy. Using the DPSEEA model (see figure 1) we can identify many important challenges, drivers and exposures in the domain of housing.

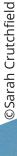
Some important drivers in the area of healthy housing are:

- · population density;
- · population ageing;
- economy/income (increasing socio-economic inequalities);
- life styles;
- spatial planning and policies regarding housing materials;
- · construction standards;
- consumer products and energy saving as well as urban design (access to healthy environment, services, mobility); and
- transport.

There are a variety of indoor chemicals (VOCs, CO, NO<sub>2</sub>, tobacco smoke, asbestos), microbiological (mould, dust) and physical exposures (temperature, radon and radiation) in and around houses

and building blocks associated with a range of health impacts (annoyance, asthma, cardiovascular diseases, etc.).

Figure 1 expresses something of this complexity but also illustrates another important point, namely that identical drivers can influence health through both a proximal (near in space and time) pathway but also a distal (or ecosystems) pathway. By extension, carefully conceived policies and actions can be relevant to both proximal and distal pathways. By framing issues using this simple conceptual framework, policies and actions can be highlighted which confer co-benefits, but which may also impact negatively on another domain. In the case of housing for example, policies to secure energy efficiency might reduce ventilation rates and by extension GHG emissions. However, the very same policies might profoundly reduce indoor air quality to the detriment of occupant health and well-being.



# Modelling approach derived from Reis at al (2013) http://www.publichealthjrnl.com/article/50033-3506%2813%2900242-4/abstract

### **Policy actions**

In many EU countries the main obstacles (or challenges) in developing healthy housing are a lack of awareness of potential health impacts amongst citizens, policy-makers and inspectorates, as well as contradictory regulation (e.g. energy saving vs ventilation). There is a lack of coherent policies, due to the difficulty of cross-sectorial or cross-ministerial collaboration.

The conflicting areas between housing policies and environmental health should be considered at an early stage of planning in order to minimize negative health impacts. Suitable indicators need to be developed to evaluate the health impacts related to housing and spatial planning in a systemic way (Figure 2). We see large social inequalities in housing, between and within EU Member States (Figure 3).

Figure 1. Application of the dDPSEEA model to housing

#### HOUSING DRIVERS Lack of maintenance and enegy inefficiency; Population growth and lower aferage occupancy levels; **PROXIMAL DISTAL** Inadequate planning controls (remote from amenities, **PATHWAY PATHWAY** built in flood plains etc.,) Fuel availability and cost and influencing choice of heating **PRESSURE** source insulation and ventilation levels; **PRESSURE** Rapod urbanisation; Insufficient heat input and Resident behaviour high levels of heat loss; Emission of GHGs and Mould growth on surfaces particulates; and hdm proliferation; Pressure on natural habitats **ACTIONS** Build up of chemical pollutiants (EXAMPLES) Health surveillance; **STATE STATE** Increase energy of buildings; Policies promoting domestic en-· Poor indoor air quality; ergy (technological & fisical); Temporary housing; Damaged planetary Improved building regulations ecosystems resulting in Low indoor air temperature; and planning standards; climate-related damage to Temperature difference Product controls on domestic Supporting, Provisioning, between the rooms; appliances and equipment; Regulatory and Cultural Damp, mouldy homes; Overcoming legislation "ecosystem services" for · Overcrowded homes; certain populations; · Noisy homes; n.b. Policies and actions to improve Dwellings lacking basic Reduced biodiversity health and well-being may be amenities targeted to different stages on the pathways and/or to the context EXPOSURE/EXPERIENCE **EXPOSURE/EXPERIENCE** Inhalation of air pollutants; Exposure to noise; Context influences both Exposure and Effect Local population experience Dislocated communities; for the individual and can create Environmental reduced material benefits, Population exposure to health and well-being inequalities damaged social relations, speeding vehicles; and security Damaged social relations; · Reduces individual choice **HEALTH & WELL-BEING** Mortality, morbidity related to allergic respiratory disease, Diminished mental SOCIAL, ECONOMIC hypothermia, accidents: falls, SOCIAL, ECONOMIC and physical health; AND BEHAVIORAL burns and scalds, asphyx-AND BEHAVIORAL Reduced well-being iation, toxic effects, CVD, **CONTEXT CONTEXT** cancers, sleep-disturbance, mental illness, Reduced well-being

n.b. Global economic social and ecosystem connectivity means the distal pathway can impact on the proximal pathway in health relevant ways and vice versa

Figure 2. Selected indicators on environmental and health effects of housing

#### **DRIVING FORCES**

- Degree of urbanisation1
- Building rate of new private houses<sup>2</sup>
- Rate of renovation of old houses with state financial support (to increase insulation, energy-efficiency of heating devices)<sup>2</sup>
- Progress in energy efficiency in households (ODEX index)<sup>3</sup>
- Drivers of the change in average annual energy consumption per household<sup>3</sup>

# 1

#### **PRESSURES**

- Energy efficiency gain from building standards of new buildings<sup>3</sup>
- Household energy consumption for space heating per m<sup>2</sup> (climate corrected)<sup>3</sup>
- Household energy consumption for cooling per area (m²)³



#### STATE

- People living in homes affected by dampness and mould<sup>1</sup>
- Proportion of households by mode of heating<sup>2</sup>
- Rate of overcrowding<sup>1</sup>
- Proportion of dwellings lacking basic amenities<sup>1</sup>
- Rate of buildings with energy certification /by result of the certification<sup>2</sup>



#### **EXPOSURE**

- Exposure to noise3
- Population living near roads of heavy traffic<sup>2,3</sup>



#### **EFFECTS**

- Incidence of allergic respiratory diseases<sup>2</sup>
- Noise annoyance of the inhabitants<sup>1</sup>
- Morbidity and mortality due to CO poisoning<sup>2</sup>
- Incidence of domestic accidents: falls, burns, scalds, asphyxiation, poisoning<sup>2</sup>
- Incidence of Legionellosis4

#### **DATA SOURCES**

- 1. Eurostat
- 2. National data collection
- 3. EEA
- 4. ECDC

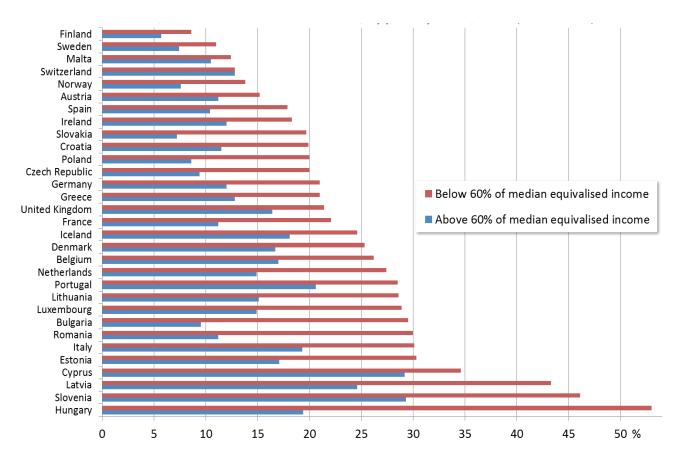
#### **ACTIONS**

- Policy on installation of smoke-detectors<sup>2</sup>
- Policy on installation of CO-detectors<sup>2</sup>
- Policy on mandatory regular check of natural-gas heating devices<sup>2</sup>
- Regulation on low emission construction materials, furniture and other product used indoors<sup>2</sup>
- Labelling of building materials<sup>2</sup>
- National/regional/local programs to increase energy efficiency of buildings<sup>2</sup>
- Policy on mandatory energy certification of buildings<sup>2</sup>
- Policies on implementation of Tele-Health services<sup>2</sup>
- Policies on implementation of emergency alert systems<sup>2</sup>

#### SOCIO-ECONOMIC CONTEXT

- Functional and activity limitations<sup>1</sup>
- Housing cost overburden rate<sup>1</sup>
- At-risk-poverty rate<sup>1</sup>
- Material deprivation rate<sup>1</sup>
- Income inequality<sup>1</sup>
- · Monetary poverty (total population,
- · the elderly)1
- Housing deprivation<sup>1</sup>

Figure 3. Share of total population living in a dwelling with a leaking roof, damp walls, floors or foundation, or rot in window frames of floor; by poverty status, 2012.



Source: EUROSTAT, European Union Statistics on Income and Living Conditions (EU-SILC), available at: <a href="http://ec.europa.eu/eurostat/web/income-and-living-conditions/data/main-tables">http://ec.europa.eu/eurostat/web/income-and-living-conditions/data/main-tables</a>

## **Key messages**

Indicators and data on housing are widely available in international databases and can be amended by national data collections.

Structured analysis and reporting are needed in future health impact assessments, for which a combination of the modified DPSEEA and distal DPSEEA models is a useful tool.

Several national policies proved to be effective in facilitating the provision of healthier housing.

An international compendium on effective good practices could be helpful in developing Europeanwide measures to ensure healthy homes for the citizens.

This leaflet was produced by the FRESH consortium under a project funded by the European Environmental Agency in 2014. More information is available at <a href="https://www.eea.eu/ehwb">www.eea.eu/ehwb</a>