

## CHILDREN LIVING IN HOMES WITH PROBLEMS OF DAMP

FACT SHEET 3.5 • December 2009 • CODE: RPG3\_Hous\_Ex2

### Data on the exposure of the population to damp in the home

This summary is based on self-reported data collected by Eurostat on the proportion of households with problems of damp (1). It also contains information on the environment and health context, the policy relevance and context, and an assessment of the situation in the WHO European Region.

#### KEY MESSAGE

☺ In recent years, annual surveys providing representative data on the total population of European Union (EU) Member States have shown that exposure to dampness is a frequent health risk, with 18% of the EU population exposed in 2007 (vs 19% and 18% in 2005 and 2006, respectively). Exposure varies greatly among countries, however, ranging between 5% and 37%. High exposure levels are especially reported by the new EU Member States in eastern Europe, but within such countries reporting a high prevalence there is also an indication that exposure has fallen in recent years. Differences may be due to a combination of factors, including climate, socioeconomic status, housing characteristics, culture and lifestyle, and the existence and effectiveness of related policies (e.g. on ventilation or thermal insulation). Children are particularly susceptible to the health effects of damp, which include respiratory disorders such as irritation of the respiratory tract, allergies and exacerbation of asthma.

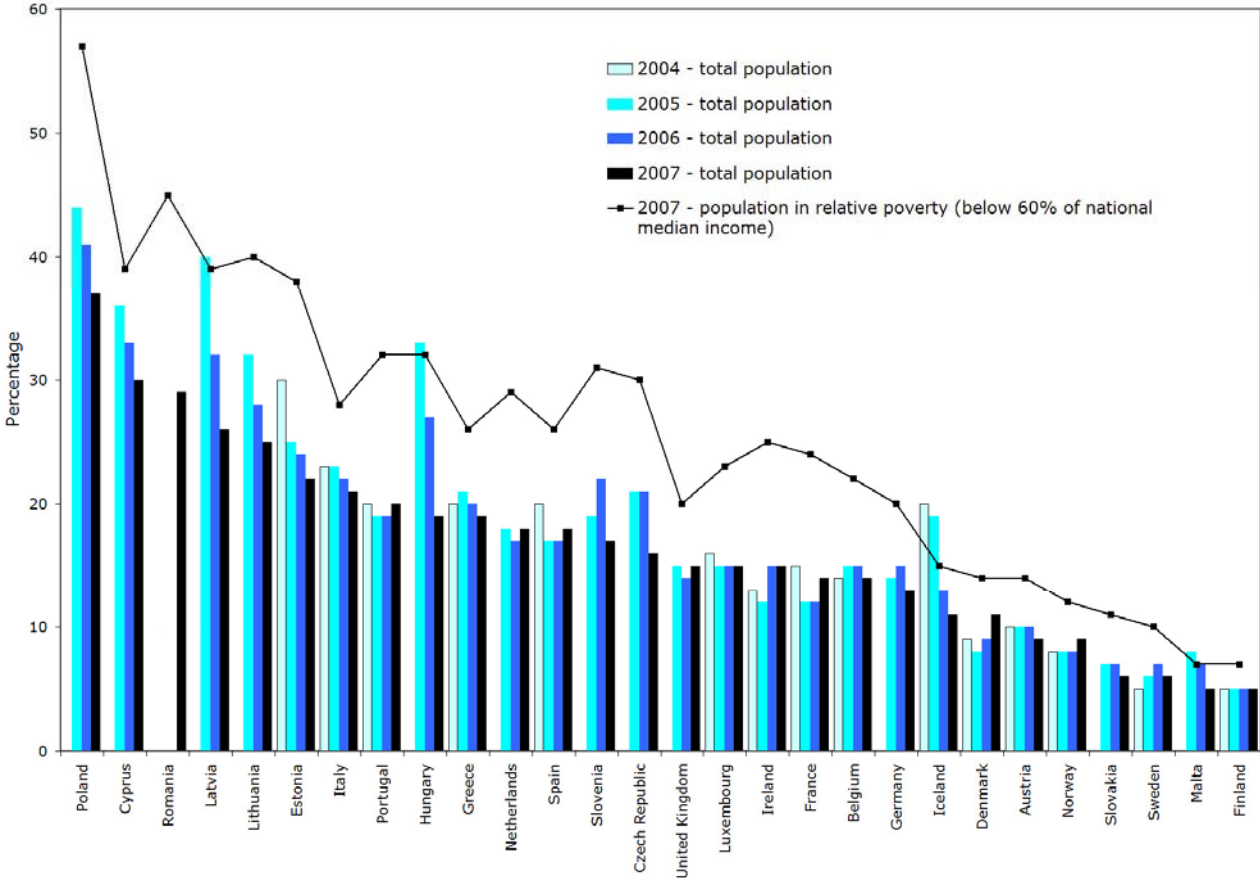
#### RATIONALE

This indicator provides an estimate of the proportion of the population exposed to damp. The data are based on household surveys and represent the reported prevalence of damp-related problems; consequently, they serve only as an indication of the scale of the problem. However, international comparisons are difficult and the main message can be derived from trends in national data rather than variations among countries. The rationale for including this indicator is the strong evidence that exposure to damp in the home is an important risk factor for a number of illnesses, particularly respiratory conditions (2).

#### PRESENTATION OF DATA

Fig. 1 shows the proportion of the population in selected European countries living in housing with self-reported problems of dampness between 2004 and 2007. Overall, the proportion decreased in many countries but, in some, the exposure situation has not improved and/or remains unacceptably high. Fig. 1 also shows the proportion of the population in relative poverty being exposed to dampness-related housing problems; this is significantly higher than for the total population in almost all countries.

**Fig. 1. Proportion of the total population living in homes with self-reported problems of damp, 2004–2007, and proportion of population in relative poverty living in homes with self-reported problems of damp, 2007**



Source: Eurostat (1).

## HEALTH AND ENVIRONMENT CONTEXT

Dampness, humidity and thermal conditions are of concern in many European countries. The number of household members, activities such as cooking, laundering and bathing, the use of certain fuels for heating and cooking, the indoor temperature/thermal insulation and especially the degree of ventilation all affect the amount of water vapour in indoor air. Water leakage due to structural damage may also contribute to dampness.

The presence of problems due to mould in indoor environments is attributable to dampness and condensation, and often enhanced by inadequate ventilation or unfavourable building conditions. Excess moisture leads – on almost all indoor materials – to growth of microbes such as moulds, fungi and bacteria, which subsequently emit spores, cells, fragments and volatile organic compounds into the indoor air. Moreover, dampness initiates chemical and/or biological degradation of materials, which also causes pollution of the indoor air. Exposure to microbial contaminants is clinically associated with respiratory symptoms, allergies, asthma and immunological reactions. Dampness has therefore been suggested to be a strong and consistent indicator of risk for asthma and respiratory symptoms such as cough and wheeze (2). The health risks are described in the WHO guidelines for indoor air quality in more detail, as follows (2):

- Sufficient epidemiological evidence is available from studies conducted in different countries and under different climatic conditions to show that the occupants of damp or mouldy buildings, both houses and public buildings, are at increased risk of respiratory symptoms, respiratory infections and exacerbation of asthma. Some evidence suggests increased risks of allergic rhinitis and asthma. Although few intervention studies were available, their results show that remediation of dampness can reduce adverse health outcomes.

- There is clinical evidence that exposure to mould and other dampness-related microbial agents increases the risks of rare conditions, such as hypersensitivity pneumonitis, allergic alveolitis, chronic rhinosinusitis and allergic fungal sinusitis.
- Toxicological evidence obtained *in vivo* and *in vitro* supports these findings, showing the occurrence of diverse inflammatory and toxic responses after exposure to microorganisms isolated from damp buildings, including their spores, metabolites and components.
- While groups such as atopic and allergic people are particularly susceptible to biological and chemical agents in damp indoor environments, adverse health effects have also been found in nonatopic populations.
- The increasing prevalences of asthma and allergies in many countries increase the number of people susceptible to the effects of dampness and mould in buildings.

This exposure indicator is closely connected with other housing quality indicators and their effects. Damp is often associated with poor housing and social conditions, poor indoor air quality and inadequate housing hygiene, which includes factors such as overcrowding, low air exchange rate, low indoor temperature and poor insulation. All of these factors influence health status.

Reduction of mould and damp in housing can be achieved by a policy framework describing the components and implementation of national plans. Financial incentives and supporting instruments are necessary for the implementation of effective interventions such as the rehabilitation of housing stock.

## **POLICY RELEVANCE AND CONTEXT**

In 2004, the Fourth Ministerial Conference on Environment and Health adopted the Children's Health and Environment Action Plan for Europe (CEHAPE), which includes four regional priority goals to reduce the burden of environment-related diseases in children. One of the goals (RPG III) aims at preventing and reducing respiratory diseases due to outdoor and indoor air pollution, thus contributing to a reduction in the frequency of asthmatic attacks and ensuring that children can live in an environment with clean air (3).

Several initiatives, action programmes and declarations within the framework of the United Nations Human Settlements Programme (UN-HABITAT) coordinate international bodies in their efforts to reach the United Nations Millennium Development Goals. This is done by promoting human development as the key to sustaining social and economic progress in all countries.

In European countries, problems with damp housing have been addressed partly by technical building codes (usually only applicable to new buildings) and partly by hygienic requirements aiming to ensure that conditions are not hazardous to life (although these frequently fail to include a requirement for protection against excessive humidity). In addition, many European countries have public health or related services that, on request, carry out health inspections of dwellings according to specific guidelines (4). In general, existing policies aim to ensure habitable and healthy housing conditions but do not include specific health promotion objectives. Finland, one of the countries with the lowest exposure to damp housing, addresses dampness in its Land Use and Building Act of 2003 (5). The United Kingdom has recently developed a Housing Health and Safety Rating System, by which residential buildings are evaluated on the basis of their risk to health, with damp and mould being one of the major issues addressed (6). A number of countries have developed brochures and/or detailed information for mould prevention and remediation.

The renovation of the European housing stock – especially focusing on energy efficiency as required by the EU Energy Performance of Buildings Directive (7) – represents another major policy framework affecting indoor environmental quality, especially the problem of dampness and potential mould growth. Consequences of the Directive may be an unbalanced focus on energy saving while ignoring the need for air exchange, which – if not adequately considered – can turn into a risk factor for health by enabling mould growth.

The differences among countries may, to some extent, be due to the existence and implementation of policies for preventing damp in homes. The responsibility for avoiding or reducing damp is largely left to the individual or household. With free housing markets, householders that are vulnerable owing to socioeconomic status are likely to be at risk, as they will be restricted to low-quality housing and likely to suffer from greater problems. The increased exposure to damp faced by population groups with lower income levels has been confirmed by Eurostat, showing that in almost all EU countries the exposure to dampness-related problems is significantly higher in the poorer population groups (1).

## ASSESSMENT

Overall, the indicator shows that the exposure to dampness-related problems affects almost one fifth of the EU population (19%, 18% and 18% in 2005, 2006 and 2007, respectively).<sup>1</sup> The highest prevalence is found in the eastern EU countries and some countries in the south. Nevertheless, several countries have managed to reduce their exposure levels, and levels vary greatly among countries. As damp-related problems, especially mould, can have considerable effects on health and contribute to the development of chronic health problems, any reduction in damp exposure may have a significant benefit for population health. This is especially the case in the poorer population groups, as the data indicate that exposure affects these groups disproportionately; this may indicate that additional health benefits may be realized by focusing on the damp homes of poorer residents.

Children are more susceptible than adults to exposure to indoor air pollution, including moulds and bacteria, which are increased by excessive damp (8). Good evidence to support this is available from a number of studies in Finland, Germany, Italy and Sweden that have focused on asthma and allergic symptoms among small children and their parents (9–11).

The lack of binding policies on housing standards, combined with the large number of organizations and authorities responsible for housing policy, make the rehabilitation of housing stock a challenge. In this context, international forums should support the development and implementation of national intersectoral policies on specific action aimed at improving the housing stock (4). In non-EU countries, there is also a need for standardized procedures to collect these data. From a public health perspective, research on and a better understanding of the precise mechanisms leading from damp and mould to health outcomes is still inadequate (2), as well as an overall health impact assessment of dampness and mould or the health benefits gained from building renewal.

## DATA UNDERLYING THE INDICATOR

### *Data source*

Eurostat SILC (Statistics for Income and Living Conditions) data (1).

### *Description of data*

Data on exposure to damp in the home are routinely collected through Eurostat by SILC for each Member State.

Questions used: EU-SILC: leaking roof, damp walls/floors/foundation, or rot in window frames or floor (Yes/No).

### *Method of calculating the indicator*

Original data provided by Eurostat.

### *Geographical coverage*

All EU countries.

### *Period of coverage*

2004 and continuing.

### *Frequency of update*

Annual, although access to the data may be delayed.

### *Data quality*

Weaknesses. SILC data rely on subjective assessments made by residents and are not scientifically accurate. No direct link to health effects can be made and only EU countries are included. International comparisons may suffer from many confounding factors and therefore be limited.

Strengths. The data are collected according to a consistent methodology, will be available for all EU countries on an annual basis and will provide a good indication of national trends.

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<sup>1</sup> Earlier studies under the ECHP (European Community Household Panel) agreement up to 2001 showed a higher prevalence of dampness-related problems in most countries. Data from 2004 onwards are based on a new survey (SILC – Statistics on Income and Living Conditions) with slightly modified methodological approaches, making comparison with data from 2001 difficult.

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## FURTHER INFORMATION

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