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ENVIRONMENTAL HEALTH INDICATORS IN A DANISH HEALTH INTERVIEW SURVEY

Paper submitted by the National Institute of Public Health, Denmark[1]

Abstract: Some environmental health indicators may be based on self-reported data, such as data on exposure suited for self-reporting and on annoyance and risk perception in relation to environmental factors as well as data on behaviour of relevance for exposure. In the paper the background for the choice of questions on environmental health subjects in a Danish national health survey is presented. Criteria for selection of questions on exposure were that the environmental factor should be widespread in the population, it should be preventable, including changeable personal behaviour, and the exposure should have potentially significant adverse health effects. The exposure should also be suited for self-reporting, meaning that it should be exposure that can be sensed, a short period of exposure time (that can be remembered) is relevant, and only few simple questions are needed. Knowledge on exposure as well as on annoyance and risk perception should not already be available from another source, and it should be of relevance to the public health policy. Already validated questions were scarce, so existing validated questions could not be an absolute criterion.

Questions on environmental health in the Danish Health Interview Survey in 2000 turned out to cover primarily the indoor environment at home and the outdoor environment in the near vicinity of home. Data on risk perception were covering a broader spectrum of the environment. A number of environmental health indicators based on the data from the health interview survey are proposed. The indicators include exposure to environmental tobacco smoke, insufficient airing of the residence caused by outdoor noise or air pollution, humidity damages in the residence, annoyance from environmental factors at home, including temperature, lack of light, noise, unpleasant smell, indicators of behaviour, including airing of the residence and use of chemicals to fight weed, insects etc., indicators of effect such as 'building-related symptoms', and indicators of perception of risks in and around the home, at work and from pollutants in food and drinking-water.

Limitations of the method of self-reporting mean that environmental health indicators based on self-reported data should be supplemented by indicators based on measurements of exposure, effects and behaviour where better methods are available and practical to use in nationally representative samples.

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1. Objective

The objective is to present the background for choice of questions to obtain data on some environmental health indicators in a Danish national health interview survey. As the method of obtaining data in the health survey is self-reporting by respondents in an interview or a questionnaire, it will be analysed which aspects of environmental health indicators will be especially suited for self-reporting.

Only a few preliminary results on questions in the Danish Health Interview Survey in 2000 are available at the moment. Apart from the presentation of some environmental health indicators one of the objectives of the future analyses is to study inequity in environmental health by analysing distribution of hazardous exposure and annoyance from environmental factors in different socio-economic groups. Also exposure of certain susceptible groups such as small children and people with allergy or asthma will be analysed.

In this paper the focus is mainly on factors in the non-occupational environment, and here primarily the indoor environment at home and the outdoor environment in the near vicinity of home.

2. Background

The influence of potentially hazardous environmental factors on population health is being discussed in Denmark as well as in many other countries. Lack of information on exposure of the population to potentially hazardous environmental factors constitutes a significant limitation for risk assessment. Risk assessment is a precondition for making efficient plans for prevention of environmental health problems and for evaluation of preventative measures. Some hazardous exposure may be prevented by rather simple changes of behaviour by the inhabitants of a residence, such as exposure to environmental tobacco smoke and humidity and other indoor air problems. Prevention of some other hazardous exposure may require political regional or national decisions, such as traffic planning, land use in relation to water resources and general demands for buildings.

Political priority setting is influenced by the risk perception in the general population. The actually most risky exposure is for the moment not always one that is prevented most efficiently. If a more rational use of the resources for prevention was to be possible, it is necessary to improve communication about the actual risks. To be able to ameliorate this communication there is a need for better risk assessment as well as better understanding of the risk perception among the general population.

In Denmark regular nationally representative health surveys by personal interviews and self-administered questionnaires are carried out. On the website of the National Institute of Public Health (www.niph.dk) information on the Health Interview Survey in 1994 is published in English. For the 2000-survey it was decided to include the theme potentially hazardous environmental factors, to get an overview of exposure to these factors, of behaviour of significance to exposure, and of the relation to annoyance and other potential health effects.

Priority should be given to environmental factors that are widespread and preventable in the Danish population, had potentially significant adverse health effects, and were suited for self-reporting (table 1). Other criteria for selection were that a spectrum of relevant aspects of environmental health should be included and at the same time the total number of questions should be limited in order to have a high participation rate in the survey and to limit the costs

of conducting the collection and further processing of the data. Furthermore some questions about risk perception should be included.

Criteria for validation of questions in surveys are listed in a discussion paper from the International Epidemiology Association, European Division (IEA 1998). The intention in relation to the theme of environmental factors in the Danish Health Interview Survey was to use well-tested and validated questions to the extent that it was possible to identify such questions. However, at the time of planning the survey only few similar surveys including environmental factors could be identified and documentation of validation of questions was scarce, so the criterion of existing validated questions was not used as an absolute criterion.

Table 1. Criteria for selection of questions concerning environmental factors in the Danish Health Interview Survey

Widespread exposure
Preventable exposure, including changeable personal behaviour
Potentially significant adverse health effects
Suited for self-reporting
Exposure that can be sensed
A short period of exposure time (that can be remembered) is relevant
Only few simple questions are needed
(Existing validated questions)
Knowledge is not already available from another source
Relevance for the public health policy

Use of questionnaires when collecting data on the influence of potentially hazardous environmental factors on the population has the following advantages:

- In many cases questionnaires, for practical and economical reasons, are the only possible way to get information from a large population, and they can be used as a screening instrument of exposure, experienced by the individual.

- Information from questionnaires can be indicators of exposure of which data may be difficult to obtain in other ways. For example information on humidity and mould in the residence may be an indicator of house dust mites and of compounds resulting from mould growth, and the use of gas appliances may be used as an indicator of exposure to NO2.

- When sufficiently good measurement methods of exposure are not developed, or it is not at all possible to measure an exposure with an instrument, questionnaires may be useful. This is the case for example in some retrospective studies and in studies of the subjective perception as to how annoying an exposure is. Such sensorial impressions may have significant impact on the quality of life, and smell may also be an indicator of health damaging exposure. Strong smells may initiate asthma symptoms, headache and other symptoms. Information on individual activities and habits at home and in the leisure time, the frequency of the activities and the time spent on them, may require answers on questionnaires.

- Differences in exposure, measured by instruments, may be explained by information from questionnaires, including time activity diaries.

- To get information from questionnaires is relatively inexpensive, as more participants may be included, and thus the statistical power will be better than in studies with few participants

having exposure or effects measured by instruments or by clinical and laboratory investigations.

3. Subjects and methods

Search of literature and contacts to key persons in the area of environmental health and health surveys have given part of the background for the choice of questions on environmental health. Additionally a prioritisation has been made, based on the above-mentioned criteria for selection of questions, concerning potential health significance of the environmental factor and suitability for self-reporting.

Altogether 17 key persons in the field of environmental health and health surveys were contacted, both in Denmark and abroad, and presented with a draft questionnaire and asked about their experiences with this type of questions and their knowledge as to relevant validated questions. We received answers from 12 of these key persons. Before decisions on the final questionnaire for the health interview survey experts in environmental health from Danish agencies of environment and health and of Danish research in environmental health were asked to comment a draft questionnaire in order to make the questionnaire as relevant as possible to the present Danish needs.

The national health interview survey was conducted in 2000, distributed into three rounds over the year to include possible variations with time of year. The preliminary results presented in the annex derive from the nationally representative sample among adult Danes (age 16 and more) of 5802 persons, 4356 (75,1 %) of which participated in a personal interview and 3811 (65,7 %) returned filled in self-administered questionnaires.

In the health interview survey the participants were asked several so-called core questions about socio-demographic background, job situation, health, morbidity and lifestyle. Additional themes were included in the survey, among these a theme on environmental factors with some questions in the interview and several questions in the self-administered questionnaire. Use of personal interview usually results in a higher participation rate than use of self-administered questionnaire. For both economic and practical reasons a maximum duration of the personal interview however was fixed, thus setting limits for the number of questions on environmental factors that could be posed this way. Anyway, some of the questions on environmental matters were best suited for self-administered questionnaires as a confrontation with an interviewer could influence answers to questions such as 'worrying about ones own health in relation to exposure to various environmental factors' and 'cleaning

4. Results of prioritisation of questions

The criterion: widespread exposure, pointed to exposure in the residence and its nearest environment influencing the indoor environment of the residence. Thus the population in a country like Denmark stays indoor 80-90% of the time, the majority of this time at home (Jantunen 1997). WHO has also identified the home environment as one of the main objectives in relation to needs for European initiatives in the environmental area (Concern for Europe's Tomorrow 1995). In relation to the work on priority setting of research in environmental health in Europe, research into indoor air quality and health was given high priority (Brunekreef 1998, European Science Foundation 1998). The method of self-reporting is a chance of getting new important knowledge on exposure and habits at home, not otherwise available. The indoor environment at home also meets with the criteria of some exposure being preventable and changeable by the behaviour of the inhabitants.

The criterion: potentially significant adverse health effects, pointed to factors such as environmental tobacco smoke, noise and air pollution from traffic, humidity problems at home, allergens from pets and house dust mites, polluting heating systems or gas installations at home, ventilation of the home, and indoor problems in day-care institutions and schools.

As exposure to potentially hazardous environmental factors may often result in unspecific symptoms or aggravation of existing illnesses, it is limited which conclusions can be drawn from the relationship between separately reported exposure to environmental factors and symptoms. So it was decided to use some questions as to the respondent's annoyance from a list of environmental exposure and as to their impression of the relationship between environmental factors and their own symptoms and illnesses. Also, knowledge as to the population's perception of risk from exposure to various environmental factors is considered of importance to understand the political priorities in environmental policies and as a background for improving risk communication between experts and lay people. So, some questions on risk perception were included, covering a broad spectrum of environmental factors.

Questions concerning environmental factors in the interview included type of residence, drive-through traffic at the residence, whether conditions in the respondent's home made the respondent or other members of the household ill or aggravated health problems and symptoms, whether other environmental factors made the respondent ill or aggravated health problems and symptoms, whether environmental factors in day-care institutions or schools had caused the (youngest) child of the respondent to become ill or to get health problems or symptoms, whether the respondent had been annoyed by various environmental factors at home within the past two weeks before the interview, the number of daily smokers in the household, and the number of hours during the day the respondent will normally spend in a room where people smoke in the presence of the respondent.

Questions on environmental factors in the self-administered questionnaire covered symptoms that may be building-related, whether the respondent worried that some listed conditions may be harmful to the health of the respondent, the conditions being in and around the home, at work or being pollutants in food or drinking-water, annoyance by unpleasant smell inside the home from a list of sources, some questions about hygiene in the room in which the respondent sleeps, such as type of flooring and carpets on the floor, ventilation of the room during sleep and steam up in the morning of the bedroom windows, barriers for airing the residence properly, ventilation possibilities in kitchen and bathroom, humidity damages in the residence, pets indoors in the home, the frequency of a list of hygiene activities at home, such as airing and cleaning, use of selected heating sources at home, presence of gas installations at home, number of hours normally spent away from the home on week-days, and finally use of chemicals to fight weed, insects, algae and fungus inside the home or on the premises.
The following subjects were considered for inclusion because of their potential impact on human health, but they were excluded from the health survey or only included partly for the reasons mentioned:

Occupational environment was only included with a small list of questions as the National Institute of Occupational Health in Denmark conducts thorough separate surveys on occupational environment.

Environment in day-care institutions and schools was only included indirectly by parent-reported relationship between these environments and illnesses and symptoms in their youngest child. It was our impression that parents' description of exposure in these environments would be too incomplete, and supplementary information from personnel at institutions and schools and from technical personnel at the local authority would be necessary to ask for. The resources for the health survey could not cover this.

Environments in areas used for leisure time activities were not included because leisure time may be spent in so many different places (apart from at home places such as sports facilities, nature, houses in holiday areas, amusement centres), and the health survey could not contain so many different questions.

Accidents were only partly covered as separate projects on registration of accidents and analyses of causes are going on in Denmark.

Exposure to radon was not included as it cannot be sensed and can only be registered by instruments.

Exposure to hazardous compounds in drinking water was not included as you are usually not able to taste or smell the compounds, necessitating laboratory analyses.

Contaminants in food would have to be analysed in laboratories. It was considered whether questions on frying of food (an indicator of mutagens in the fried food) should be included as well as hygiene habits in the kitchen (an indicator of hazardous microbial exposure), but it was decided not to do it because other studies on this were going on in Denmark.

Exposure to some heavy metals and to pesticides was not included because it is not possible to sense small concentrations of heavy metals or pesticides, and several sources exist (food, drinking-water, dust/soil, air). To be relevant for the health the exposure also has to be known retrospectively as heavy metals and many pesticides tend to accumulate in the body over time.

Use of cosmetics, perfume, shampoo etc. was not included because it would have demanded questions about names of products and lists of contents, not realistic in the health survey. For the same reason information about use of cleaning materials and materials for maintaining house and garden were not included.

Exposure to volatile organic compounds was not included as there may be many sources in building materials and indoor activities, and the health impact of common concentrations in indoor air is still being debated.

Only for some of the subjects well-tested and/or validated questions were identified. Concerning questions on indoor exposure a couple of references were found (Lebowitz 1989, Jantunen 1997), but the local conditions should also be taken into consideration when constructing the questionnaires (Coggon 1995). Concerning questions on exposure to air pollution, the questionnaire from the project called EXPOLIS (Air Pollution Exposure Distributions of Adult Urban Populations in Europe) has been among the background material, and one of the key persons contacted has been M. Jantunen, National Public Health Institute, Kuopio, Finland. Also the questionnaire from ECRHS (European Community Respiratory Health Survey) (Burney 1994) has been studied, and so has the ISAAC (International Study on Asthma and Allergies in Childhood) (Keil 1996).

Some inspiration has come from the German Environmental Health Survey (Seifert 2000), although the character of this was somewhat different from the Danish one. At the time of planning of the health interview survey the interim report from WHO Regional Office for Europe on Environmental Health Indicators (WHO 2000) had not emerged yet, so suggestions of self-reported data from this paper were not available. Nor was the Swedish questionnaire of their environmental health survey reported in 2001 (Socialstyrelsen 2001) available.

5. Proposal for prioritisation of environmental health indicators from a health interview survey

5.1 Indicators of exposure

Among the questions on exposure those on environmental tobacco smoke were considered to fulfil all the criteria in table 1, so the following questions are proposed as environmental health indicators:

Percentage of adults, exposed daily to environmental tobacco smoke at home, at work and elsewhere. Percentage of children, exposed daily to environmental tobacco smoke at home.

In Denmark, airing of the residence is regarded as a fundamental prerequisite for avoiding accumulation of damp and hazardous air pollutants indoors. So insufficient airing means higher risk of exposure to damp, with the consequences this may have concerning house dust mites, mould etc., and to hazardous air pollutants. Environmental factors such as outdoor noise and air pollutants may prohibit sufficient airing of the residence, so questions as to these barriers of sufficient airing are proposed.

Percentage of adults with insufficient airing of the residence due to noise outside the windows. Percentage of adults with insufficient airing of the residence due to air pollution outside the windows.

Humidity damages arise both in old, not well-maintained, residences and in newer, not properly built, homes, and there is increasing knowledge as to potential adverse effects of mould growth etc. on the health of the inhabitants. This is considered a potentially important environmental health problem in Denmark both for children and adults, so questions on the prevalence of humidity damages in the residence are proposed:

Percentage of adults living in a residence with humidity damages in a 5-years period. Percentage of children living in a residence with humidity damages in a 5-years period.

5.2 Indicators of annoyance

The method of self-reporting is the only way to get knowledge on annoyance from various environmental factors. Noise and air pollution, including unpleasant smell, are widespread sources of annoyance, and the perception of annoyance can also give indications as to potential health damages. Some types of air pollution cannot be sensed directly, so exposure

to such types of air pollution will not be mirrored by annoyance. The following questions are proposed as indicators of annoyance:

Percentage of adults annoyed by one or more of the following environmental factors concerning temperature and light at home, in a two-week period:

- Too high or too low temperature
- Draught
- Cold floor
- The residence is too dark

Percentage of adults annoyed by one or more of the following environmental factors concerning noise or vibrations at home, in a two-week period:

- Noise from traffic
- Noise from fixtures (e.g. sewer, radiators, refrigerators)
- Noise from neighbours
- Noise from nearby businesses
- Infrasound or low frequency noise (deep humming)
- Vibrations (e.g. caused by traffic)

Percentage of adults annoyed by noise from traffic in a two-week period.

Percentage of adults annoyed by noise from neighbours in a two-week period.

Percentage of adults annoyed by unpleasant smell inside their home due to one or more of the following environmental factors, in a two-week period:

- Smoking inside the home
- Traffic near the residence
- Building materials of the residence
- Mould and mould fungus
- Neighbours' activities
- Neighbouring wood burning
- Industry near the residence
- Other known sources (e.g. sewer, waste, manure)
- Unknown sources inside or outside

Percentage of adults annoyed by unpleasant smell inside the home from smoking, in a two-week period.

Percentage of adults annoyed by unpleasant smell inside the home from traffic near the residence, in a two-week period.

Percentage of adults annoyed by unpleasant smell inside the home from neighbouring wood burning, in a two-week period.

Noise from traffic and noise from neighbours give rise to annoyance among relatively large parts of the population, and noise annoyance from these sources is thus proposed as separate indicators. Annoyance from noise can also be regarded as an indicator of potential sleeping problems and of some more serious potential cardio-vascular and psychological health effects. Separate questions on disturbed sleep from noise were not allowed in the health survey as

they took up too much space, otherwise direct data on sleep disturbance could have been proposed among the indicators.

Unpleasant smells from smoking, from traffic and from neighbouring wood burning give rise to annoyance among relatively large parts of the population too. Separate indicators are proposed on annoyance from these sources, also because they may be used as indicators of exposure to air pollution containing problematic products from incomplete combustion.

5.3 Indicators of behaviour

As mentioned above, airing of the residence is considered important to diminish hazardous exposure. In many Danish homes an important way of airing consists of actively opening windows, so a question is proposed concerning behaviour in relation to airing:

Percentage of adults airing the residence on a daily or almost daily basis.

One way individuals may behave according to a sustainable environment is to avoid the use of chemicals to fight weed, insects etc. at home and on the premises, so a question is proposed on this item:

Percentage of adults using chemicals to fight weed, insects, algae and fungus inside the home. Percentage of adults using chemicals to fight weed, insects, algae and fungus on the premises.

5.4 Indicators of effects

So-called building-related symptoms may arise from hazardous pollutants or high temperatures indoors, but these symptoms may also have other reasons. So, like many other potential effects of environmental factors, they are unspecific, and the prevalence of these symptoms will give a mixture of possible effects of environmental factors and an impression of the percentage of susceptible persons. The absence of these symptoms may be more interpretable than the prevalence of them. The following indicator is proposed (or the inverse of it):

Percentage of adults with one or more of the following 'building-related symptoms', daily or more than once a week - Itching, dryness or irritation of the eyes - Itching, dryness or irritation of the nose - Stuffy or runny nose - Dryness or irritation of the throat - Dry or flushed facial skin - Unusual tiredness - Headache or a feeling of heaviness in the head - Difficulties concentrating

5.5 Indicators of risk perception

Worrying that environmental factors may harm your health may in it cause adverse health effects. Also the percentage of the population being worried indicates attention on exposure and engagement in environmental matters. The following questions concerning risk perception covering various parts of the environment are proposed:

Percentage of adults worrying that one or more of the following conditions in and around the home may be harmful to their own health
- Chemical substances in the cleaning materials they use
- Noise
- Humidity
- Environmental tobacco smoke
- House dust mites
- Mould fungus
- Air pollution from traffic
- Industrial pollution
- Radon (radioactive gas from the subsoil)
- Electromagnetic fields from electric equipment or from high-voltage lines
- Soil pollution

Percentage of adults worrying that one or more of the following conditions at work may be harmful to their own health
- Noise
- Other people's tobacco smoking
- Air pollution from work processes

Percentage of adults worrying that one or more of the following pollutants in food or drinking water may be harmful to their own health
- Pesticide residue or other kinds of chemical pollution in the food
- Bacteria, e.g. salmonella in the food
- Polluted drinking water

6. Discussion

In this paper a rather big number of indicators are proposed, the background being an analysis of which type of indicators could be relevant as self-reported information in a health interview survey. The circumstances under which indicators are supposed to be used will of course determine the type of indicator needed, how simple the indicators should be, and the optimal number.

Very little is included as to adverse health effects in the proposals above. It has been argued that it is difficult to relate exposure to hazardous environmental factors to health effects. In a cross-sectional survey with exposure and relevant effect data only for the past two weeks or so, the relationship possible to analyse will primarily be exposures expected to give acute or sub-acute effects, sensed by the respondent. Multiple regression analyses may be made to look at the relationship between environmental factors at home and effects expressed as building related symptoms, taking into account possible confounders such as active tobacco smoking and exposure at work. Results of that type of analyses will not be simple indicators, and they will usually be considered as results of separate scientific studies instead.

Looking at human health in relation to environmental factors, however, some general health measures ought to be included among the indicators. Thus environmental factors are among the determinants of health, and the state of health tells something about the size of groups in the population being especially susceptible to hazardous environmental exposures. So some general health measures from the health interview survey could be:
- Self-perceived health, graduated in five steps from very bad to really good

- Percentage of the population with longstanding illness
- Percentage of adults not being able to work because of illness
- Percentage of the population with asthma, allergic rhinitis or other hypersensitivity in the airways
- Percentage of children with asthmatic symptoms

Especially asthmatic symptoms in children may be a good indicator of environmental health problems, because active tobacco smoking and exposure at work do not confound the measure. Asthmatic symptoms in children are also an increasing problem in Denmark as in many other western countries.

The proposed indicators on exposure to and annoyance due to environmental factors all concern potentially adverse effects. There is a tendency in public health to turn more and more to health promotion considerations than to mere risk factors and the prevention of these. When planning the Danish health interview survey it was also considered to include environmental factors with potentially positive effects on health and well-being. Unfortunately lack of space for more questions in the interview and in the self-administered questionnaire prohibited inclusion of positive environmental factors, apart from a few questions as to which conditions the respondent would wish to improve, if he or she was to move to a new residence. Therefore, in this context, there is not yet much experience with questions on positive environmental factors. An institute under the Danish Ministry of Environment has conducted some investigations on the population's use of green areas and the recreational effects of green areas. The potentially positive health effects of having easy access to green areas could be a reason to include indicators on access to and use of green areas as examples of positive indicators.

Questions on initiatives and activities among the population towards developing or maintaining a sustainable environment, whether in the local community, or by NGOs etc., could also be relevant as positive indicators on environmental health, as such activities may ameliorate some conditions, and people being active could be a sign of a healthy reaction to environmental threats. May-be it will be included in a future health survey.

If it was not a requirement that the indicators should be very simple, the indicators would give information, more relevant for prevention purposes, if they were to include analyses of distribution in gender and age-groups, in socio-economic groups, in different groups of education and in different degrees of urbanization of the residence area.

For the society to be able to focus preventative measures on the population groups with the highest needs, there should also be analyses as to which groups are exposed to or annoyed by several potentially hazardous environmental factors.

In the paragraph on background some advantages of using questionnaires for collecting data of relevance to environmental health have been listed. Problems by using questionnaires are, among others, that only exposure that can be sensed can be included, and there may be problems with the so-called content validity and criterion validity. To obtain a high content validity the included questions should be fully representative of the qualities they intend to measure. It is, as an example, relevant to evaluate content validity when using questions on behaviour. Criterion validity, also called predictive validity, is high when there is a good correlation of the questions with a 'golden standard' that is measurable in an objective way. As mentioned above it has been difficult to find much documentation on validation of

questions in relation to environmental health. Especially validated questions on exposure are scarce, as more weight has been put into validation of selected measures of health effects. In some cases it is claimed in scientific articles that the questions have been validated without the validation procedure being described. In the European working group under the International Epidemiology Association a procedure of validation of questionnaires has been proposed (IEA 1998).

This paper has been entirely about data collected in a health survey by personal interview or by self-reporting in a self-administered questionnaire. Other types of measures of exposure and health effects should supplement measures of exposure to hazardous environmental factors and of adverse health effects. It is expected that other participants at the work session on environmental health indicators will focus on other types of measures. Only a few examples from Denmark should be mentioned here. In Denmark there is a lot of ongoing work on exposure measures to traffic pollution being supplemented by the now well developed models of exposure to traffic-generated air pollution, based on knowledge on traffic type and density in various areas in combination with time activity patterns of the people studied. Personal exposure measurements are also used for selected studies to evaluate the models. Biological indicators on exposure to some types of air pollution are being developed. Large studies on exposure to damp indoor climate, including mould, are being conducted, and new knowledge on health effects of damp indoor climate is emerging. As to adverse health effects of environmental factors studies in Denmark are for example looking at environmental causes of some frequent cancer types and of the rising allergic illnesses.

7. Conclusion

Self-reported data in a health interview survey can be used for some environmental health indicators, illustrating some significant aspects of environmental health. The method of self-reporting means that a large material on exposure suited for self-reporting and on annoyance and risk perception in relation to environmental factors can be collected as well as data on behaviour of relevance to exposure. Limitations of the method mean that environmental health indicators based on self-reported data should be supplemented by indicators based on measurements of exposure, effects and behaviour where better methods are available and practical to use in nationally representative samples.

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Annex

Preliminary results of some questions on environmental health in the Danish Health Interview Survey 2000

At the time of writing it is only possible to give examples of some preliminary results from the nationally representative sample of the health survey.

Adults annoyed by one or more environmental factors at home in a two-week period: 27%

Adults annoyed by cold floor: 7%

Adults annoyed by noise from the traffic: 6%
Adults annoyed by noise from neighbours: 7%

Adults annoyed by unpleasant smell inside the home from smoking: 15%
Adults annoyed by unpleasant smell inside the home from traffic near the residence: 11%
Adults annoyed by unpleasant smell inside the home from neighbouring wood burning: 6%

Adults with humidity damages in the residence in a 5-year period: 17%

Adults airing the residence on a daily or almost daily basis: 91%

Adults with insufficient airing of the residence due to noise outside the windows: 4%

Adults with insufficient airing of the residence due to air pollution outside the windows: 2%

Adults using chemicals to fight weed, insects, algae and fungus inside the home: 10%
Adults using chemicals to fight weed, insects, algae and fungus on the premises: 35%

Adults having 'building-related symptoms' daily or more than once a week: The single symptoms range from 3-8%

Adults worrying that conditions in and around the home may be harmful to their own health: Examples of results:

Worrying about chemical substances in the cleaning materials they use: 13%
Worrying about noise: 8%
Worrying about humidity: 10%
Worrying about environmental tobacco smoke: 19%
Worrying about house dust mites: 14%
Worrying about mould fungus: 9%
Worrying about air pollution from traffic: 23%
Worrying about industrial pollution: 18%
Worrying about radon (radioactive gas from the subsoil): 10%
Worrying about electromagnetic fields
from electric equipment or from high-voltage lines: 11%
Worrying about soil pollution: 14%

Adults worrying that pollutants in food or drinking water may be harmful to their own health: Examples of results:

Worrying about pesticide residue

or other kinds of chemical pollution in the food: 61%
Worrying about bacteria, e.g. salmonella in the food: 68%
Worrying about polluted drinking water: 48%