Research outputs:

Children’s health and its association with indoor environments in Danish homes and daycare centres – methods
The principle objective of the Danish research program Indoor Environment and Children’s Health (IECH) was to explore associations between various exposures that children experience in their indoor environments (specifically their homes and daycare centers) and their well-being and health. The targeted health endpoints were allergy, asthma, and certain respiratory symptoms. The study was designed with two stages. In the first stage, a questionnaire survey was distributed to more than 17 000 families with children between the ages of 1 and 5. The questionnaire focused on the childrens health and the environments within the homes they inhabited and daycare facilities they attended. More than 11 000 questionnaires were returned. In the second stage, a subsample of 500 children was selected for more detailed studies, including an extensive set of measurements in their homes and daycare centers and a clinical examination; all clinical examinations were carried out by the same physician. In this study, the methods used for data collection within the IECH research program are presented and discussed. Furthermore, initial findings are presented regarding descriptors of the study population and selected characteristics of the childrens dwellings and daycare centers.

General information
Publication status: Published
Organisations: Department of Civil Engineering, Section for Indoor Environment, Department of Systems Biology, Center for Microbial Biotechnology, H. C. Andersen Children’s Hospital, Odense City Government and Administration, Nyborg Town Administration, SP Technical Research Institute of Sweden, Aarhus University
Pages: 467-475
Publication date: 2012
Peer-reviewed: Yes

Publication information
Journal: Indoor Air
Volume: 22
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BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 2.72
Web of Science (2012): Impact factor 3.302
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
Original language: English
DOIs:
Associations between parental reports of doctor-diagnosed asthma and allergy among Danish children and their family habits and dwelling characteristics

General information
Publication status: Published
Organisations: Section for Indoor Environment, Department of Civil Engineering, Odense University Hospital, Aarhus University
Contributors: Toftum, J., Clausen, G., Bekö, G., Callesen, M., Sundell, J., Bornehag, C., Sigsgaard, T., Høst, A.
Pages: Abstract No. 564
Publication date: 2011

Host publication information
Title of host publication: Proceedings of Indoor Air 2011
Keywords: Questionnaires, Epidemiology, Risk factors, Field study
URLs:
http://www.isiaq.org/events/indoor-air-2011
Source: orbit
Source ID: 313427

Culturable mold in indoor air and its association with moisture-related problems and asthma and allergy among Swedish children

In a nested case-control study with 198 children with asthmatic and allergic symptoms (cases) and 202 healthy controls in Varmland, Sweden, we have investigated the relationship between mold spore exposure (mean colony-forming unit) indoor and (i) different indexes of moldy odor indoor (observed by professional inspectors and reported by parents), (ii) visible signs of dampness in the homes of the children (observed and reported), and (iii) doctor-diagnosed asthma/allergy in children. No association was found between the spore concentration indoor and moldy odor and signs of visible dampness in the homes. When a semi-quantitative method in distinguishing between moldy houses or non-moldy houses was used, there were no significant differences between the observed indexes of moldy odor or visible signs of dampness (both observed and reported). No association could be found between the spore concentration in indoor air and asthma/allergy in the children.

General information
Publication status: Published
Organisations: Section for Indoor Environment, Department of Civil Engineering
Contributors: Holme, J., Hagerhed-Engman, L., Mattsson, J., Sundell, J., Bornehag, C.
Pages: 329-340
Publication date: 2010
Peer-reviewed: Yes
Building characteristics associated with moisture related problems in 8,918 Swedish dwellings

Moisture problems in buildings have in a number of studies been shown to increase the risk for respiratory symptoms. The study Dampness in Buildings and Health (DBH) was initiated with the aim to identify health relevant exposures related to dampness in buildings. A questionnaire study about home environment with a focus on dampness problems and health was conducted in one county of Sweden (8,918 homes, response rate 79%). Building characteristics that were associated with one or more of the dampness indicators were for single-family houses, older houses, flat-roofed houses built in the 1960s and 1970s, houses with a concrete slab on the ground that were built before 1983. Moreover, tenancy and earlier renovation due to mould or moisture problems was strongly associated with dampness. A perception of dry air was associated with windowpane condensation, e. g. humid indoor air.

Indoor Environment and Children's Health (IECH) – An ongoing epidemiological investigation on the association between indoor environmental factors in homes and kindergartens and children's health and wellbeing

General information
Publication status: Published
Organisations: Section for Indoor Environment, Department of Civil Engineering, Center for Microbial Biotechnology, Department of Systems Biology
Pages: 603
Low home ventilation rate in combination with moldy odor from the building structure increase the risk for allergic symptoms in children

There are consistent findings on associations between asthma and allergy symptoms and residential mold and moisture. However, definitions of ‘dampness’ in studies are diverse because of differences in climate and building construction. Few studies have estimated mold problems inside the building structure by odor assessments. In a nested case-control study of 400 Swedish children, observations and measurements were performed in their homes by inspectors, and the children were examined by physicians for diagnoses of asthma, eczema, and rhinitis. In conclusion, we found an association between moldy odor along the skirting board and allergic symptoms among children, mainly rhinitis. No associations with any of the allergic symptoms were found for discoloured stains, ‘floor dampness’ or a general mold odor in the room. A moldy odor along the skirting board can be a proxy for hidden moisture problem inside the outer wall construction or in the foundation construction. There are indications that such dampness problems increase the risk for sensitization but the interpretation of data in respect of sensitization is difficult as about 80% of the children with rhinitis were sensitized. Furthermore, low ventilation rate in combination with moldy odor along the skirting board further increased the risk for three out of four studied outcomes, indicating that the ventilation rate is an effect modifier for indoor pollutants. This study showed that mold odor at the skirting board level is strongly associated with allergic symptoms among children. Such odor at that specific place can be seen as a proxy for some kind of hidden moisture or mold problem in the building structure, such as the foundation or wooden ground beam. In houses with odor along the skirting board, dismantling of the structure is required for an investigation of possible moisture damage, measurements, and choice of actions. In houses with low ventilation in combination with mold odor along the skirting board, there was even a higher risk of health effects. This emphasizes the need for the appropriate remediation as this is an ever increasing problem in poorly ventilated houses that are damp.

A comparison between occupants’ and inspectors’ reports on home dampness and their association with the health of children: The ALLHOME study

A nonlinear mixed mode model originally developed by Wernersson [Wernersson H. Fracture characterization of wood adhesive joints. Report TVSM-1006, Lund University, Division of Structural Mechanics; 1994] is discussed and applied to model interfacial cracking in a steel-concrete interface. The model is based on the principles of Hillerborgs fictitious crack model, however, the Mode I softening description is modified taking into account the influence of shear. The model couples normal and shear stresses for a given combination of Mode I and II fracture. An experimental set-up for the assessment of mixed mode interfacial fracture properties is presented, applying a bi-material specimen, half steel and half concrete, with an inclined interface and under uniaxial load. Loading the inclined steel-
concrete interface under different angles produces load-crack opening curves, which may be interpreted using the
nonlinear mixed mode model. The interpretation of test results is carried out in a two step inverse analysis applying
numerical optimization tools. It is demonstrated how to perform the inverse analysis, which couples the assumed individual
experimental load-crack opening curves. The individual load-crack opening curves are obtained under different
combinations of normal and shear stresses. Reliable results are obtained in pure Mode I, whereas experimental data for
small mixed mode angles are used to extrapolate the pure Mode II curve. (c) 2008 Elsevier Ltd. All rights reserved.

General information
Publication status: Published
Organisations: Section for Indoor Environment, Department of Mechanical Engineering, Department of Civil Engineering
Contributors: Naydenov, K., Melikov, A. K., Markov, D., Stankov, P., Bornehag, C., Sundell, J.
Pages: 1840-1849
Publication date: 2008
Peer-reviewed: Yes

Publication information
Journal: Building and Environment
Volume: 43
Issue number: 11
ISSN (Print): 0360-1323
Publication status: Published
Publication date: 2008
Peer-reviewed: Yes
Publication information
Journal: Environmental Health Perspectives
Volume: 116
Issue number: 7
ISSN (Print): 0091-6765
Publication status: Published
Publication date: 2008
Peer-reviewed: Yes

Meeting report: Measuring endocrine-sensitive endpoints within the first years of life
An international workshop titled "Assessing Endocrine-Related Endpoints within the First Years of Life" was held 30 April-
1 May 2007, in Ottawa, Ontario, Canada. Representatives from a number of pregnancy cohort studies in North America
and Europe presented options for measuring various endocrine-sensitive endpoints in early life and discussed issues
related to performing and using those measures. The workshop focused on measuring reproductive tract developmental
endpoints [e.g., anogenital distance (AGD)], endocrine status, and infant anthropometry. To the extent possible, workshop
participants strove to develop or recommend standardized measurements that would allow comparisons and pooling of
data across studies. The recommended outcomes include thigh fat fold, breast size, vaginal cytology, AGD, location of the
testis, testicular size, and growth of the penis, with most of the discussion focusing on the genital exam. Although a
number of outcome measures recommended during the genital exam have been associated with exposure to endocrine-
disrupting chemicals, little is known about how predictive these effects are of later reproductive health or other chronic
health conditions.

General information
Publication status: Published
Organisations: Department of Mechanical Engineering
Contributors: Arbuckle, T., Hauser, R., Swan, S., Mao, C., Longnecker, M., Main, K., Whyatt, R., Mendola, P., Legrand, M.,
Pages: 948-951
Publication date: 2008
Peer-reviewed: Yes

Publication information
Journal: Environmental Health Perspectives
Volume: 116
Issue number: 7
ISSN (Print): 0091-6765
Publication status: Published
Publication date: 2008
Peer-reviewed: Yes
Publication information
Journal: Environmental Health Perspectives
Volume: 116
Issue number: 7
ISSN (Print): 0091-6765
Publication status: Published
Publication date: 2008
Peer-reviewed: Yes

Keywords: neurodevelopment, anogenital distance, reproductive tract development, endocrine disruptors, sexual
dimorphism, infants, anthropometry, measurement, hormones, genital exam
The association between phthalates in dust and allergic diseases among Bulgarian children

BACKGROUND: Recent studies have identified associations between the concentration of phthalates in indoor dust and allergic symptoms in the airways, nose, and skin.

OBJECTIVES: Our goal was to investigate the associations between allergic symptoms in children and the concentration of phthalate esters in settled dust collected from children’s homes in Sofia and Burgas, Bulgaria.

METHODS: Dust samples from the child’s bedroom were collected. A total of 102 children (2-7 Years of age) had symptoms of wheezing, rhinitis, and/or eczema in preceding 12 months (cases), and 82 were nonsymptomatic (controls). The dust samples were analyzed for their content of dimethyl phthalate (DMP), diethyl phthalate (DEP), di-n-butyl phthalate (DnBP), butyl benzyl phthalate (BBzP), di(2-ethylhexyl) phthalate (DEHP), and di-n-octyl phthalate (DnOP).

RESULTS: A higher concentration of DEHP was found in homes of case children than in those of controls (1.24 vs. 0.86 mg/g dust). The concentration of DEHP was significantly associated with wheezing in the preceding 12 months (p = 0.035) as reported by parents. We found a dose-response relationship between DEHP concentration and case status and between DEHP concentration and wheezing in the preceding 12 months.

CONCLUSIONS: This study shows an association between concentration of DEHP in indoor dust and wheezing among preschool children in Bulgaria.

The effects of electrostatic particle filtration and supply-air filter condition in classrooms on the performance of schoolwork by children (RP-1257)

Two independent field intervention experiments involving a total of about 190 pupils were carried out in winter and early spring of 2005 in five pairs of mechanically ventilated classrooms that received 100% outdoor air. Each pair of classrooms was located in a different static air cleaners were installed in classrooms and either operated or disabled to modify particle concentrations while the performance of schoolwork was measured. In one school, the used supply-air filters in a ventilation system without recirculation were also replaced with new ones to modify classroom air quality, while the filters in use in other schools were not changed. The conditions were established for one week at a time in a blind crossover design with repeated measures on ten-to-twelve-year-old children. Pupils performed six exercises exemplifying different aspects of schoolwork as part of normal lessons and indicated their environmental perceptions and the intensity of any symptoms. A sensory panel of adults judged the air quality in the classrooms soon after the pupils left. Operating the electrostatic air cleaners considerably reduced the concentration of particles in the classrooms. The effect was greater the lower the outdoor air supply rate. There were no consistent effects of this reduction on the performance of schoolwork, on
the children's perception of the classroom environment, on symptom intensity, or on air quality as perceived by the sensory panel. This suggests there are no short-term (acute) effects of particle effects were inconsistent, removal outside the pollen season. When new filters were installed, the e although this is believed to be due to sequential and unbalanced presentation of filter conditions and to the fact that the used filters retained very little dust.

**General information**
Publication status: Published
Organisations: Section for Indoor Environment, Department of Mechanical Engineering
Contributors: Wargocki, P., Wyon, D. P., Jensen, K. L., Bornehag, C.
Pages: 327-344
Publication date: 2008
Peer-reviewed: Yes

**Publication information**
Journal: HVAC&R Research
Volume: 14
Issue number: 3
ISSN (Print): 2374-4731
Ratings:
BFI (2008): BFI-level 1
Scopus rating (2008): SJR 0.867 SNIP 0.884
Web of Science (2008): Indexed yes
Original language: English
Source ID: 233781
Research output: Contribution to journal › Journal article – Annual report year: 2008 › Research › peer-review

**Comparison of clinically diagnosed asthma with parental assessment of children's asthma in a questionnaire**
Epidemiological evaluations of the prevalence of asthma are usually based on written questionnaires (WQs) in combination with validation by clinical investigation. In the present investigation, we compared parental assessment of asthma among their preschool children in response to a WQ with the corresponding medical records in the same region. An International Study of Asthma and Allergies in Childhood (ISAAC)-based WQ was answered by 75% of the parents of 6295 children aged 1-6 yr. Clinically diagnosed asthma, recorded in connection with admissions to the hospital or a visit to any of the outpatient clinics in the same region, were analysed in parallel. Finally, a complementary WQ was sent to the parents of children identified as asthmatic by either or both of this approaches. In response to the WQ 5.9% were claimed to suffer from asthma diagnosed by a doctor. According to the medical records, the prevalence of clinically diagnosed asthma was 4.9%. The estimated prevalence among children requiring treatment for their asthma was 4.4%. The sensitivity of the WQ was 77%, the specificity 97.5%. In the 1-2 yr age group the sensitivity was only 22%. This WQ was able to identify 54% of the children with a medical record of asthma. Forty percent of the children claimed by their parents to be asthmatic had no medical record of asthma. An ISAAC-based parentally completed WQ provided an acceptable estimation of the prevalence of asthma in children 2-6 yr of age, although only half of the individual patients identified in this manner are the same as those identified clinically.

**General information**
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Hederos, C., Hasselgren, M., Hedlin, G., Bornehag, C.
Pages: 135-141
Publication date: 2007
Peer-reviewed: Yes

**Publication information**
Journal: Pediatric Allergy and Immunology
Volume: 18
Issue number: 2
ISSN (Print): 0905-6157
Ratings:
Scopus rating (2007): SJR 1.629 SNIP 5.564
Web of Science (2007): Indexed yes
Original language: English
Keywords: preschool children, medical records, prevalence, asthma, questionnaires
DOIs:
10.1111/j.1399-3038.2006.00474.x
Source: orbit
How valid are parents' questionnaire responses regarding building characteristics, mouldy odour, and signs of moisture problems in Swedish homes?

Aim: Questionnaires are a cheap means of studying large populations but the information obtained from them is seldom validated. Earlier studies have reported both high and low levels of agreements between inspectors' observations and occupants' reports regarding home environmental factors that included moisture problems. The aim of this study was to validate information received from a questionnaire survey regarding building characteristics, mouldy odour, and signs of moisture problems in 390 Swedish homes. Method: In a case control study on the association between home environmental factors and asthma/allergy among children, 390 homes were visited by trained inspectors for ocular inspection of visible moisture damage and perceptions of mouldy odour. Their observations were then compared with questionnaire reports collected 18 - 24 months earlier from the families. Results: A high level of agreement was found between the inspectors' observations and the occupants' questionnaire reports on technical parameters. This included type of house, type of ventilation system, and foundation, particularly in single-family houses. There was low agreement regarding vinyl or linoleum floor coverings and indications of dampness and mouldy odour. However, the stronger the mouldy odour experienced by the inspector, the higher the level of agreement. Conclusions: The questionnaire was a quite reliable source regarding technical parameters of the home but not for dampness problems. The questionnaire was better for predicting buildings without problems than detecting problems of mouldy odour and visible indications of moisture. To increase the validity of future questionnaires, simple drawings or information on critical spots for dampness could be used.

ALLHOME study, 2006: Clinical signs of allergy and sensitization of pediatric population in two big cities in Bulgaria

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Mustakov, T., Naydenov, K. G., Ratcheva, R., Sundell, J., Melikov, A. K., Popov, T., Bornehag, C., Stankov, P.
Publication date: 2006

Host publication information
Title of host publication: XXV Congress of the European Academy of Allergology and Clinical Immunology
Source: orbit
Source ID: 195155
Research output: Chapter in Book/Report/Conference proceeding › Article in proceedings – Annual report year: 2006 › Research
A Study on Dampness and Mold Exposures and their Associations with Asthma and Allergies among 20103 Young Children in Sweden

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Zuraimi, M., Naydenov, K. G., Hägerhed-Engman, L., Tham, K., Bornehag, C., Sundell, J.
Publication date: 2006

Host publication information
Title of host publication: HEALTHY BUILDINGS 2006
Source: orbit
Source ID: 195294
Research output: Chapter in Book/Report/Conference proceeding – Annual report year: 2006 – Research

Composition and diversity of biological indoor allergens in mattress dust: ALLHOME study, phase 2

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Publication date: 2006

Host publication information
Title of host publication: 8th International Congress on Aerobiology
Source: orbit
Source ID: 195152
Research output: Chapter in Book/Report/Conference proceeding – Annual report year: 2006 – Research

Day care attendance increased the risk for respiratory and allergic symptoms in pre-school age

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Hägerhed-Engman, L., Bornehag, C., Sundell, J., Åberg, N.
Pages: 447-453
Publication date: 2006
Peer-reviewed: Yes

Publication information
Journal: Allergy
Volume: 61
Ratings:
Scopus rating (2006): SJR 1.437 SNIP 1.464
Web of Science (2006): Indexed yes
Original language: English
Source: orbit
Source ID: 194754
Research output: Contribution to journal – Journal article – Annual report year: 2006 – Research – peer-review

Environmental tobacco smoke and health symptoms among children in the ALLHOME study

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Publication date: 2006

Host publication information
Title of host publication: ERS 16th Annual Congress
Potential self-selection bias in a nested case-control study on indoor environmental factors and their association with asthma and allergic symptoms among pre-school children

Selection bias means a systematic difference between the characteristics of selected and non-selected individuals in epidemiological studies. Such bias may be introduced if participants select themselves for a study. The present study aims at identifying differences in family characteristics, including health, building characteristics of the home, and socioeconomic factors between participating and non-participating families in a nested case-control study on asthma and allergy among children. Information was collected in a baseline questionnaire to the parents of 14,077 children aged 1-6 years in a first step. In a second step, 2,156 of the children were invited to participate in a case-control study. Of these, 198 cases and 202 controls were finally selected. For identifying potential selection bias, information concerning all invited families in the case-control study was obtained from the baseline questionnaire. Results show that there are several possible biases due to self-selection involved in an extensive study on the impact of the home environment on asthma and allergy among children. Factors associated with participating were high socioeconomic status of the family, more health problems in the case families, and health-related lifestyle factors, such as non-smoking parents. The overall conclusion of this study is that there are selection biases involved in studies that need close cooperation with the families involved. One solution to this problem is stratification, i.e. investigating associations between exposures and health in the same socioeconomic strata.

Presences of phthalate esters in homes

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Sundell, J., Bornehag, C.
Pages: S86-S86
Publication date: 2006
Peer-reviewed: Yes

Publication information
Journal: Epidemiology
Volume: 17
Issue number: 6
ISSN (Print): 1044-3983
Ratings:
Scopus rating (2006): SJR 2.104 SNIP 1.954
Web of Science (2006): Indexed yes
Original language: English
Source: orbit
Source ID: 198348
Research output: Contribution to journal › Journal article – Annual report year: 2006 › Research › peer-review
Prevalence of SBS symptoms in residential buildings in Bulgaria

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Naydenov, K. G., Markov, D., Mustakov, T., Melikov, A. K., Popov, T., Stankov, P., Bornehag, C., Sundell, J.
Publication date: 2006

Host publication information
Title of host publication: Healthy Buildings
Source: orbit
Source ID: 195159
Research output: Chapter in Book/Report/Conference proceeding – Article in proceedings – Annual report year: 2006

Validation of self-reported health symptoms and housing characteristics in the ALLHOME project

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Publication date: 2006

Host publication information
Title of host publication: Healthy Buildings
Source: orbit
Source ID: 195161
Research output: Chapter in Book/Report/Conference proceeding – Article in proceedings – Annual report year: 2006

ALLHOME project group, 2006: Allergy/asthma and keeping pets in early childhood: a cross-sectional survey of 6155 children in Bulgaria

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Naydenov, K. G., Sundell, J., Melikov, A. K., Popov, A., Mustakov, T., Bornehag, C., Stankov, P.
Publication date: 2005

Host publication information
Title of host publication: Proceedings of World Allergy Congress
Source: orbit
Source ID: 195147
Research output: Chapter in Book/Report/Conference proceeding – Article in proceedings – Annual report year: 2006

Association between ventilation rates in 390 Swedish homes and alleric symptoms in children

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Bornehag, C., Sundell, J., Hagerhed-Engman, L., Sigsgaard, T.
Pages: 275-280
Publication date: 2005
Peer-reviewed: Yes

Publication information
Journal: Indoor Air
‘Dampness’ at home and its association with airway, nose, and skin symptoms among 10,851 preschool children in Sweden: a cross-sectional study

There is convincing epidemiological evidence that ‘dampness’ in buildings is associated with respiratory effects. In order to identify health-relevant exposures in buildings with ‘dampness’, the study ‘Dampness in Buildings and Health’ (DBH) was initiated. In the first step of the study, cross-sectional data on home characteristics including ‘dampness’ problems, and symptoms in airway, nose, and skin among 10,851 children (1-6 years), were collected by means of a questionnaire to the parents. The prevalence of wheezing during the last 12 months was 18.9% and doctor-diagnosed asthma 5.4%. Rhinitis during the last 12 months was reported for 11.1% of the children and eczema during the last 12 months 18.7%. Gender, allergic symptoms among parents, and age of the child were associated with symptoms. Water leakage was reported in 17.8% of the buildings, condensation on windows in 14.3%, and detached flooring materials in 8.3%. Visible mould or damp spots were reported in only 1.5% of the buildings. The four ‘dampness’ indices were associated to higher prevalence of symptoms in both crude and adjusted analysis. Furthermore, it was found that the combination of water leakage in the home and PVC as flooring material in the child’s or parent’s bedroom was associated to higher prevalence of symptoms among children. However, the interpretation of this finding is unclear. The combination of water leakage and PVC may be a proxy, for example, reconstruction because of water damages.

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Bornehag, C., Sundell, J., Hagerhed-Engman, L., Sigsgaard, T., Janson, S., Aberg, N.
Pages: 48-55
Publication date: 2005
Peer-reviewed: Yes
Housing characteristics in Sweden and Bulgaria: two questionnaire studies

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Naydenov, K. G., Sundell, J., Melikov, A. K., Popov, T., Bornehag, C., Stankov, P.
Pages: 3574-3575
Publication date: 2005

Host publication information
Title of host publication: Indoor Air 2005
Volume: 5
Source: orbit
Source ID: 197401

Phthalates in Indoor Dust and Their Association with Building Characteristics

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Pages: 1399-1404
Publication date: 2005
Peer-reviewed: Yes

Publication information
Journal: Environmental Health Perspectives
Volume: 113
Issue number: 10
ISSN (Print): 0091-6765

Potential Selection Biases

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Bornehag, C., Sundell, J., Weschler, C. J., Sigsgaard, T.
Pages: A152-A153
Publication date: 2005
Peer-reviewed: Yes

Publication information
Journal: Environmental Health Perspectives
Volume: 113
Issue number: 3
ISSN (Print): 0091-6765

Ratings:
Prevalence of asthma, allergic rhinitis and atopic dermatitis in children at 2-8 years of age in two big cities in Bulgaria

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Mustakov, T., Naydenov, K. G., Ratcheva, R., Sundell, J., Melikov, A. K., Popov, T., Bornehag, C., Stankov, P.
Publication date: 2005

Host publication information
Title of host publication: World Allergy Congress
Source: orbit
Source ID: 197384
Research output: Chapter in Book/Report/Conference proceeding – Annual report year: 2005 – Research

Quantitative determination of volatile organic compounds in indoor dust using gas chromatography-UV spectrometry

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Nilsson, A., Lagesson, V., Bornehag, C., Sundell, J., Tagesson, C.
Pages: 1141-1148
Publication date: 2005
Peer-reviewed: Yes

Publication information
Journal: Environment International
Volume: 31
Issue number: 8
ISSN (Print): 0160-4120
Ratings:
Scopus rating (2005): SJR 1.772 SNIP 1.722
Web of Science (2005): Indexed yes
Original language: English
Source: orbit
Source ID: 188994

The home environment and allergies among Bulgarian children

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Contributors: Naydenov, K. G., Sundell, J., Melikov, A. K., Popov, A., Bornehag, C., Stankov, P.
Pages: 3574-3575
Publication date: 2005

Host publication information
Title of host publication: Proceedings of Indoor Air 2005
Source: orbit
Source ID: 188862
Research output: Chapter in Book/Report/Conference proceeding – Article in proceedings – Annual report year: 2005 – Research
The association between asthma and allergic symptoms in children and phthalates in house dust: a nested case-control study

General information
Publication status: Published
Organisations: Indoor Environment, Department of Mechanical Engineering
Pages: 1393-1397
Publication date: 2004
Peer-reviewed: Yes

Publication information
Journal: Environmental Health Perspectives
Volume: 112
ISSN (Print): 0091-6765
Ratings:
Scopus rating (2004): SJR 0.475 SNIP 1.775
Web of Science (2004): Indexed yes
Original language: English
Source: orbit
Source ID: 155927
Research output: Contribution to journal › Journal article – Annual report year: 2004 › Research › peer-review

Validation of questionnaire data with inspections on dampness indications in 390 Swedish dwellings, DBH Step 2

General information
Publication status: Published
Organisations: Department of Mechanical Engineering
Contributors: Hagerhed, L., Bornehag, C., Sundell, J.
Publication date: 2003

Host publication information
Title of host publication: Proceedings of Healthy Buildings 2003
Place of publication: Singapore
Publisher: Healthy Buildings 2003
Source: orbit
Source ID: 25684
Research output: Chapter in Book/Report/Conference proceeding › Article in proceedings – Annual report year: 2003 › Research › peer-review

Ventilation rate in 400 homes and its impact on asthma and allergy among children in Sweden. A case control study

General information
Publication status: Published
Organisations: Department of Mechanical Engineering
Contributors: Bornehag, C., Sundell, J., Hagerhed, L.
Publication date: 2003

Host publication information
Title of host publication: Proceedings of 4th International Conference on Cold Climate
Place of publication: Trondheim
Publisher: CC HVAC 2003
Source: orbit
Source ID: 25686
Research output: Chapter in Book/Report/Conference proceeding › Article in proceedings – Annual report year: 2003 › Research › peer-review

Dampness in buildings and health. Building characteristics as predictors for dampness in 8681 Swedish dwellings

Questionnaire data on 8681 dwellings included in the Swedish study "Dampness in Buildings and Health" have been analysed for associations between dampness indicators, perceptions of indoor air quality and building characteristics such as time of construction, type of ventilation and type of foundation. Visible mold or damp stains were reported in 1.3 and 1.6% of single-family and multi-family houses respectively, dampness connected to the floor in 6.5 and 13.9% and condensation on windows in 12.5 and 16.9%. "Stuffy air" was reported in 22.3 and 42.8%, "Moldy odor" in 3.9 and 5.8% and perception of "Dry air" in 17.3 and 33.7% respectively. Older buildings and the use of natural ventilation were associated with increased frequency of dampness indicators as well as to increased frequencies of complaints on bad
Dampness in buildings and health. Dampness at home as a risk factor for symptoms among 10 851 Swedish children (DBH-Step 1)
With the overall aim of identifying health-relevant exposures in "damp" buildings, an interdisciplinary epidemiological study started in Sweden in 1999, namely "Dampness in Buildings and Health" (DBH). The first step of the study (carried out during spring 2000) included a cross-sectional questionnaire study on 14 077 children (1-6 years) focusing on their health and their home environment. There were strong and consistent associations between different "dampness"-indicators and symptoms among children. The combination of floor moisture problems and PVC as flooring material significantly increased the risk for symptoms.

Dampness in buildings as a risk factor for health effects. European multidisciplinary review of the entire literature (EUROEXPO)
The scientific literature on health effects associated with "dampness" in buildings including literature between 1998 and 2000 has been reviewed by a European group (EUROEXPO). The group consisted of scientists with experience from medicine, epidemiology, toxicology and engineering. Of the 104 reviewed articles 52 were excluded as they were judged as background papers or "non-informative" or "inconclusive" or the study did not present data on exposure, health effects or analysis of the association between exposure and health. The review group concluded that "dampness" in buildings is a risk factor for health effects such as cough, wheeze, asthma, general symptoms and airway infections among atopics and non-atopics, both in domestic and public environments. However, the literature is inconclusive in respect of causative agents in such buildings. Suggested causative agents are mites, microbiological agents and organic chemicals from degraded building materials.

Small particles containing phthalic esters in the indoor environment - a pilot study
Many chemicals in polymeric materials have low vapour pressure. Hypothetically such chemicals are emitted and may stay as particles or be adsorbed onto dust particles and become airborne. The aim of this pilot study has been to validate
the methods for measuring phthalates on particles in indoor environments. Sedimented dust from the child’s bedroom in seventeen homes has been sampled using a Vacuu Mark sampler and a vacuum cleaner. The dust is collected on 90 millimetre cellulose filters, which are extracted and analysed by techniques such as HPLC and GCMS. First results have shown that phthalates and chemicals were extruded from the polymeric material. A co-variation between the amounts of the phthalate, DEHP on the filters and the type of interior decoration on walls and floors were found.

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Dampness in buildings and health: Nordic interdisciplinary review of the scientific evidence on associations between exposure to "dampness" in buildings and health effects (NORDDAMP)
Several epidemiological investigations concerning indoor environments have indicated that “dampness” in buildings is associated to health effects such as respiratory symptoms, asthma and allergy. The aim of the present interdisciplinary review is to evaluate this association as shown in the epidemiological literature. A literature search identified 590 peer-reviewed articles of which 61 have been the foundation for this review. The review shows that “dampness” in buildings appears to increase the risk for health effects in the airways, such as cough, wheeze and asthma. Relative risks are in the range of OR 1.4-2.2. There also seems to be an association between "dampness" and other symptoms such as tiredness, headache and airways infections. It is concluded that the evidence for a causal association between "dampness” and health effects is strong. However, the mechanisms are unknown. Several definitions of dampness have been used in the studies, but all seems to be associated with health problems. Sensitisation to mites may be one but obviously not the only mechanism. Even if the mechanisms are unknown, there is sufficient evidence to take preventive measures against dampness in buildings.

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