Editorial

Dear Reader,

we are pleased to send you our latest Newsletter No. 30 on Housing and Health!

Our Newsletter supports WHO projects in compilation and dissemination of housing and health information to the public, to scientific experts, and to policy-makers and provide a significant contribution towards strengthening interdisciplinary exchange and cooperation in the field of housing and urban health.

This edition comprises a summary of literature collection (indoor air, radon, respiratory diseases, microorganisms and dampness, ageing society, energy, urban planning and noise), information on WHO activities (message board) and an event calendar.

Herewith we inform you that new WHO Environmental Noise Guidelines for the European Region was published. The Guidelines provide the recommended exposure levels for protecting human health from exposure to environmental noise originating from various sources: transportation (road traffic, railway and aircraft) noise, wind turbine noise and leisure noise. Expert committees assessed the relation between environmental noise and several health outcomes: cardiovascular and metabolic effects; annoyance; effects on sleep; cognitive impairment; hearing impairment and tinnitus; adverse birth outcomes; and quality of life, mental health, and wellbeing.

Here you will find the Guideline Environmental Noise Guidelines for the European Region (2018).

Kind regards
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News on Housing and Health

**Indoor Air**

Mögliche Auswirkungen des Klimawandels auf die Luftqualität in Innenräumen
Stellungsnahme der Kommission Innenraumlufthygiene (IRK) am Umweltbundesamt
Bundesgesundheitsbl 2019; 62: 232

Presence of diphenyl phosphate and aryl-phosphate flame retardants in indoor dust from different microenvironments in Spain and the Netherlands and estimation of human exposure
Björnsdotter MK, Romera-García E, Borrull J, de Boer J, Rubio S, Ballesteros-Gómez A
Environ Int. 2018; 112:59-67

**Gesundheitliche Bewertung von 1,2-Dichlorethan (1,2-DCE) in der Innenraumluft**
Mitteilung des Ausschusses für Innenraumrichtwerte (AIR), 2018
Bundesgesundheitsbl 2019; 62: 114

Differential determination of plasticizers and organophosphorus flame retardants in residential indoor air in Japan

Polycyclic aromatic hydrocarbons in a bakery indoor air: trends, dynamics, and dispersion

Indoor air quality of everyday use spaces dedicated to specific purposes - a review
Marć M, Śmiełowska M, Namieśnik J, Zabiegała B

Indoor air humidity, air quality, and health - An overview
Wolkoff P
Int J Hyg Environ Health. 2018; 221(3):376-390

Presence and human exposure assessment of organophosphate flame retardants (OPEs) in indoor dust and air in Beijing, China

Bioaccessibility and bioavailability of environmental semi-volatile organic compounds via inhalation: A review of methods and models
Environ Int. 2018; 113:202-213

Indoor air quality of newly built low-energy preschools – Are chemical emissions reduced in houses with eco-labelled building materials?
Persson J, Wang T, Hagberg J
Indoor Built Environ, 2019; 28(4):506–519

Electronics, interior decoration and cleaning patterns affect flame retardant levels in the dust from Dutch residences
Sugeng EJ, de Cock M, Leonards PEG, van de Bor M
Sci Total Environ. 2018; 645:1144-1152

Preparation of a polyacrylonitrile/polyurethane nanofibrous membrane with antibacterial function and measurement of its air filtration performance
Wu Y, Lu Y, Cao G
Indoor Built Environ, 2018
### A review of green systems within the indoor environment
Moya TA, den Dobbelsteen A van, Ottelé M, Bluyssen PM
Indoor Built Environ, 2019; 28(3):298–309

### Inhibitory effect of mould growth on formaldehyde emissions from medium-density fibreboards: Evidence from field observations in three experimental houses
Liang W, Lv M, Yang X
Indoor Built Environ, 2018

### Source apportionment and influencing factor analysis of residential indoor PM2.5 in Beijing

### The inhibitory effect of mould growth on formaldehyde emissions from medium-density fibreboards: Evidence from field observations in three experimental houses
Liang W, Lv M, Yang X
Indoor Built Environ, 2018

### Inhibitory effect of mould growth on formaldehyde emissions from medium-density fibreboards: Evidence from field observations in three experimental houses
Liang W, Lv M, Yang X
Indoor Built Environ, 2018

### Light and Radiation

#### Estimation of residential radon exposure and definition of radon priority areas based on expected lung cancer incidence
Elio J, Crowley Q, Scanlon R, Hodgson J, Zgaga L
Environ Int. 2018; 114:69-76

#### Cancer risk following alpha-emitter exposure
Tirmarche M
Ann ICRP. 2018; 47(3-4):115-125

#### Radon and thoron progeny in Dutch dwellings
Smetsers RCGM, Blaauboer RO, Dekkers F, Slaper H
Radiat Prot Dosimetry. 2018; 181(1):11-14

#### Radon levels in indoor environments of the university hospital in Bari-Apulia region southern Italy
Vimercati L, Fucilli F, Cavone D, De Maria L, Birtolo F, Ferri GM, Soleo L, Lovreglio P

#### Assessment of residential radon exposure in Bulgaria
Kunovska B, Ivanova K, Badulin V, Cenova M, Angelova A

#### Radon and PM10 concentrations in underground parking lots and subway stations with health risks in South Korea
Hwang SH, Park WM

#### Radon risk communication in Bulgaria
Makedonska G1, Djounova J1, Ivanova K1.

#### A review of indoor and outdoor radon equilibrium factors-part II: 220Rn
Chen J, Harley NH
Health Phys. 2018; 115(4):500-506

#### A review of indoor and outdoor radon equilibrium factors-part I: 222Rn
Chen J, Harley NH
Health Phys. 2018; 115(4):490-499

#### A review of indoor and outdoor radon equilibrium factors-part II: 220Rn
Chen J, Harley NH
Health Phys. 2018; 115(4):500-506

#### A review of indoor and outdoor radon equilibrium factors-part I: 222Rn
Chen J, Harley NH
Health Phys. 2018; 115(4):490-499
Indoor radon gas (222Rn) levels in homes in Aldama, Chihuahua, Mexico and the risk of lung cancer
Lerma-Treviño C, Rubio-Arias H, Colmenero-Sujo LH, de Lourdes Villalba M, Ochoa-Rivero JM

Indoor radon exposure in Italian schools

Radon in schools: A brief review of state laws and regulations in the United States
Gordon K, Terry PD, Liu X, Harris T, Vowell D, Yard B, Chen J

Allergies and Respiratory Diseases

Impact of indoor air quality on respiratory health: results of a local survey on housing environment
Lévesque B, Huppé V, Dubé M, Fachehoun RC
Public Health. 2018; 163:76-79

Domestic exposure to moulds and mite allergens in Parisian patients
Dalibert E, Dusséaux M, Bex V, Mathieu C, Barral S, Dubrou S
Rev Mal Respir. 2018; 35(9):907-918

Allergie - eine Umwelterkrankung
Traidl-Hoffmann C
UMID 02/2018, 47-55

Impact of indoor air quality on respiratory health: results of a local survey on housing environment
Lévesque B, Huppé V, Dubé M, Fachehoun RC
Public Health. 2018; 163:76-79

Elektronisches Polleninformationsnetzwerk in Bayern kurz vor dem Start
Deutsches Ärzteblatt, 2019

Exposure to volatile organic compounds and airway inflammation
Kwon JW, Park HW, Kim WJ, Kim MG, Lee SJ
Environ Health. 2018; 17(1):65

Asthma risk associated with indoor mold contamination in Hispanic communities in Eastern Coachella Valley, California
Sinclair R, Russell C, Kray G, Vesper S

Background factors of chemical intolerance and parent-child relationships
Azuma K, Ohyama M, Azuma E, Nakajima T
Environ Health Prev Med. 2018; 23(1):52

Physical and chemical trigger factors in environmental intolerance
Claeson AS, Palmquist E, Nordin S
Int J Hyg Environ Health. 2018; 221(3):586-592
### Bacteria, Mould and Dampness

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### Smoking / Environmental Tobacco Smoke

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E-Cigarette and liquid nicotine exposures among young children
Govindarajan P, Spiller HA, Casavant MJ, Chounthirath T, Smith GA
Pediatrics. 2018; 141(5). pii: e20173361

The influence of three e-cigarette models on indoor fine and ultrafine particulate matter concentrations under real-world conditions
Environ Pollut. 2018; 243(Pt B):882-889

Tobacco control policies to promote awareness and smoke-free environments in residence and workplace to reduce passive tobacco smoking in Bangladesh and its correlates
Sultana P, Rahman MT, Roy DC, Akter S, Jung J, Rahman MM, Akter J

Complete smokefree policies in mental health inpatient settings: results from a mixed-methods evaluation before and after implementing national guidance
Huddleston L, Sohal H, Paul C, Ratschen E
BMC Health Serv Res. 2018; 18(1):542

Solid fuel use for cooking and its health effects on the elderly in rural China
Liu J, Hou B, Ma XW, Liao H

Bathing adaptations in the homes of older adults (BATH-OUT): results of a feasibility randomised controlled trial (RCT)
Whitehead PJ, Golding-Day MR, Belshaw S, Dawson T, James M, Walker MF

Falls among physically active elderly in senior housings, Bangkok, Thailand: situations and perceptions
Maneeprom N, Taneepanichskul S, Panza A

Social disconnection among older adults receiving care in the emergency department
Kandasamy D, Platts-Mills TF, Shah MN, Van Orden KA, Betz ME

Interventions targeting sedentary behavior in non-working older adults: a systematic review
Aunger JA, Doody P, Greig CA
Maturitas. 2018; 116:89-99

Osteoporosis and low bone mineral density (osteopenia) in rural and remote Queensland
Macgregor CB, Meerkin JD, Alley SJ, Vandelanotte C, Reaburn PJ

Reporting to parents on children’s exposures to asthma triggers in low-income and public housing, an interview-based case study of ethics, environmental literacy, individual action, and public health benefits
Environ Health. 2018; 17(1):48

Food insecurity among formerly homeless individuals living in permanent supportive housing
Bowen EA, Lahey J, Rhoades H, Henwood BF
Am J Public Health. 2019; e1-e4
Perceived roles and barriers in caring for the people who are homeless: a survey of UK community pharmacists
Paudyal V, Gibson Smith K, MacLure K, Forbes-McKay K, Radley A, Stewart D

Efficacy of a horticultural activity program for reducing depression and loneliness in older residents of nursing homes in Taiwan
Chu HY, Chen MF, Tsai CC, Chan HS, Wu TL
Geriatr Nurs. 2019; pii: S0197-4572(18)30407-5

Mental Health

The influence of psychosocial stressors and socioeconomic status on sleep among caregivers of teenagers with asthma, the Puff City study
Sleep Health. 2018; 4(2):141-146

Physical and mental health impacts of household gardens in an urban slum in Lima, Peru

Close proximity to roadway and urbanicity associated with mental ill-health in older adults
Pun VC, Manjourides J, Suh HH
Sci Total Environ. 2019; 658:854-860

Mental health and quality of life among asylum seekers and refugees living in refugee housing facilities in Sweden
Leiler A, Bjärtä A, Ek Dahl J, Wasteson E

Empirical evidence of mental health risks posed by climate change
Obradovich N, Migliorini R, Paulus MP, Rahwan I
Proc Natl Acad Sci U S A. 2018; 115(43):10953-10958
Housing Conditions and Home Safety

**Knopfzellen: Verschlucken kann zu schweren Gesundheitsschäden bei Kleinkindern führen**
Bundesinstitut für Risikobewertung, 2018

**Accidental intoxication by outdoor and garden plants**
Akkidentelle Vergiftungen mit Gartenpflanzen und Pflanzen in der freien Natur
Hermanns-Clausen M, Koch I, Pietsch J, Andreason-Streichert H, Begemann K
Bundesgesundheitsbl 2019; 62: 73

**Changes in Physical Activity After Installation of a Fitness Zone in a Community Park**
Sami M, Smith M, Ogunsente OA
Prev Chronic Dis. 2018; 15:E101

**Treatment of carbon monoxide poisoning in Germany: A retrospective single center analysis**
Behandlung von Kohlenmonoxidvergiftungen in Deutschland
Eichhorn L, Kieback M, Michaelis D, Kemmerer M, Jüttner B, Tetzlaff K

**Assessment of the ventilation efficiency in the breathing zone during sleep through computational fluid dynamics techniques**

**Window/door opening-mediated bedroom ventilation and its impact on sleep quality of healthy, young adults**
Mishra AK, van Ruitenbeek AM, Loomans MGLC, Kort HSM
Indoor Air. 2018; 28(2):339-351

Thermal Comfort / Energy

**Auswertung Hitze-bezogener Indikatoren als Orientierung der gesundheitlichen Belastung**
Krug A, Mücke H-G
UMID 02/2018, 67-79

**Optimum external wall insulation thickness considering the annual CO₂ emissions**
Axaopoulos I, Axaopoulos P, Gelegenis J, Emmanouil D, Fylladitakis ED
J Build Phys 2019; 42(4): 527–544

**The environmental temperature of the residential care home: role in thermal comfort and mental health?**
Cleary M, Raeburn T, West S, Childs C
Contemp Nurse. 2019; 13:1-19

**Occupant satisfaction with indoor environmental quality and health after energy retrofits of multi-family buildings: Results from INSULAtE-project**
Haverinen-Shaughnessy U, Pekkonen M, Leivo V, Prasauskas T, Turunen M, Kiviste M, Aaltonen A, Martuzevicius D
Int J Hyg Environ Health. 2018; 221(6):921-928
Hygrothermal performance of various Typha–clay composite
Niang I, Maalouf C, Moussa T, Bliard C, Samin E, Thomachot-Schneider C, Lachi M, Pron H, Hoang Mai T, Gaye C
J Build Phys2018; 42(3): 316–335

Climate change and temperature extremes: A review of heat- and cold-related morbidity and mortality concerns of municipalities
Gronlund CJ, Sullivan KP, Kefelegn Y, Cameron L, O'Neill MS
Maturitas. 2018; 114:54-59

Urban Planning / Built Environment

Ruhige Gebiete - Eine Fachbroschüre für die Lärmaktionsplanung
Umweltbundesamt, 2018

Was tun – im Wohnungsbau?
Umweltbundesamt, 2019

Open-Air-Labor Dachbegrünung: TH Bingen sucht das ideale Gründach
Umweltbundesamt, 2018

Environmental public health risks in European metropolitan areas within the EURO-HEALTHY project
Sci Total Environ. 2019; 658:1630-1639

Grüne Dächer und Stadtklima – Kompetenzzentrum gegründet
Hochschule für Wirtschaft und Umwelt Nürtingen-Geislingen (HfWU), 2018

Associations of greenness, greyness and air pollution exposure with children’s health: a cross-sectional study in Southern Italy
Environ Health. 2018; 17(1):86

Domestic gardens and self-reported health: a national population study
Brindley P, Jorgensen A, Maheswaran R
Int J Health Geogr. 2018; 17(1):31

Green roofs and green walls and their impact on health promotion
Feitosa RC, Wilkinson S
Cad Saude Publica. 2018; 34(7):e00003618

Urban Environmental Protection - The strategic research agenda of the German Environment Agency
Umweltbundesamt, 2019
**Noise**

**Leitfaden: Information und Mitwirkung der Öffentlichkeit bei der Lärmaktionsplanung**  
UBA, 2018

**WHO Environmental Noise Guidelines for the European Region: A systematic review on environmental noise and quality of life, wellbeing and mental health**  
Clark C, Paunovic K  

**Health effects of wind turbines on humans in residential settings: Results of a scoping review**  
Freiberg A, Schechter C, Girbig M, Murta VC, Seidler A  
Environ Res. 2019; 169:446-463

**Wind turbine noise and sleep: pilot studies on the influence of noise characteristics**  
Ageborg Morsing J, Smith MG, Ögren M, Thorsson P, Pedersen E, Forssén J, Persson Waye K  

**Long-term wind turbine noise exposure and incidence of myocardial infarction in the Danish nurse cohort**  
Bräuner EV, Jørgensen JT, Duun-Henriksen AK, Backalarz C, Laursen JE, Pedersen TH, Simonsen MK, Andersen ZJ  
Environ Int. 2018; 121(Pt 1):794-802

**Long-term exposure to wind turbine noise and redemption of antihypertensive medication: A nationwide cohort study**  
Poulsen AH, Raaschou-Nielsen O, Peña A, Hahmann AN, Nordsborg RB, Ketzel M, Brandt J, Sørensen M  
Environ Int. 2018; 121(Pt 1):207-215

**Long-term exposure to wind turbine noise at night and risk for diabetes: A nationwide cohort study**  
Poulsen AH, Raaschou-Nielsen O, Peña A, Hahmann AN, Nordsborg RB, Ketzel M, Brandt J, Sørensen M

**Influence of noise exposure on cardiocerebrovascular disease in Korea**  
Oh M, Shin K, Kim K, Shin J  
Sci Total Environ. 2019; 651(Pt 2):1867-1876

**A procedure for deriving wind turbine noise limits by taking into account annoyance**  
Fredianelli L, Carpita S, Licitra G  
Sci Total Environ. 2019; 648:728-736

**Strategic noise maps and action plans for the reduction of population exposure in a Mediterranean port city**  
Paschalidou AK, Kassomenos P, Chonianaki F  
Sci Total Environ. 2018; 654:144-153

**Effects of stimulus intensity and auditory white noise on human somatosensory cognitive processing: a study using event-related potentials**  
Mizukami H, Kakigi R, Nakata H  
Exp Brain Res. 2018; doi: 10.1007/s00221-018-5443-8

**Efficacy of hearing conservation education programs for youth and young adults: a systematic review**  
Khan KM, Bielko SL, McCullagh MC  

**The effect of neighborhood density on children’s word learning in noise**  
Han MK, Storkel H, Bontempo DE  

**The effect of language, spatial factors, masker type and memory span on speech-in-noise thresholds in sequential bilingual children**  
MacCutcheon D, Pausch F, Fels J, Ljung R  
Pregnancy exposure to wind turbine noise and adverse birth outcomes: a nationwide cohort study
Poulsen AH, Raaschou-Nielsen O, Peña A, Hahmann AN, Nordsborg RB, Ketzel M, Brandt J, Sørensen M
Environ Res. 2018; 167:770-775

Long-term exposure to transportation noise and its association with adiposity markers and development of obesity
Environ Int. 2018; 121(Pt 1):879-889

Transportation noise exposure, noise annoyance and respiratory health in adults: A repeated-measures study
Environ Int. 2018; 121(Pt 1):741-750

Noise concerns of residents living in close proximity to hydraulic fracturing sites in Southwest Pennsylvania
Richburg CM, Slagley J

Miscellaneous

Deutsche Umweltstudie zur Gesundheit von Erwachsenen – GerES VI
Umweltbundesamt, 2018

Air pollution exposure in walking school bus routes: A New Zealand case study
Dirks KN, Salmond JA, Talbot N

Ultrafeine Partikel in der Umgebungsluft
UMID 02/2018; 57-65
Event Announcements

Hereby we inform you about the conferences and meetings in the disciplines relevant to Housing and Health. We request you to validate the correctness of the information. The WHO Collaboration Centre for Housing and Health does not take responsibility for the authenticity of the information provided herein.

Healthy Cities 2019
1st - 3rd of May 2019
University of Manchester, UK
Further information: Healthy Cities 2019

Hitze in der Stadt - kommunale Klimavorsorge
22nd - 23rd of May 2019
Düsseldorf, Germany
Further information: Hitze in der Stadt - kommunale Klimavorsorge

European International Conference on Transforming Urban Systems (EICTUS-2019)
26th - 28th of June 2019
Strasbourg, France
Further information: EICTUS-2019

16th International Conference on Urban Health
4th - 8th of November 2019
Xiamen, China
Further information: 16th International Conference on Urban Health
Message Board

In this section we will inform you about activities and projects related to housing and health that are being carried out by WHO or the WHO CC. This may relate to ongoing activities and projects, as well as invitations to participate in data collections or case study projects.

WHO work on indoor, built and urban environments

Health Equity and environmental inequalities

The WHO Regional Office for Europe is organizing a high level conference on health equity, planned for 11-13 June in Ljubljana, Slovenia, to address the increasing concern over the unequal distribution of risk factors, health determinants and health outcomes. Given the focus on equity issues in the WHO European Health 2020 policy and the “leaving no one behind” approach of the 2030 Agenda for Sustainable Development (2030 Agenda), there is an increasing interest in documenting the magnitude of environmental inequalities as well. To document and quantify environmental exposure inequalities and the related health impacts, WHO is currently preparing an update of its Environmental health inequalities in Europe assessment report published in 2012 (access the report here).

Imagining a better world through the SDGs

The 2030 Agenda for Sustainable Development helps us to imagine a better world, one where there is peace, partnership and prosperity for everybody and for the planet. WHO/Europe has developed a roadmap to assist countries in implementing the 2030 Agenda, building on Health 2020, the European policy for health and well-being. The goal of health and well-being for all at all ages (Goal 3) may be the most obviously relevant for WHO. But it cannot be reached without addressing the major health determinants that feature in other goals, for example: taking urgent action to combat climate change (Goal 13); achieving gender equality and empowering women and girls (Goal 5); ending poverty in all forms (Goal 1); reducing inequalities within and between countries (Goal 10); making cities inclusive, safe, resilient and sustainable (Goal 11); ensuring quality education (Goal 4); and more. Promoting good health contributes to many of the Global Goals, as they in turn contribute to better health and well-being.

To learn more about the SDGs’ relevance in the WHO European Region and what progress is being made to achieve them, visit the WHO/Europe Sustainable Development Goals site.

WHO provides health-based arguments and tools to support policy-making on climate change

WHO provided health-based arguments for action on climate change as well as tools to quantify the physical and economic benefits of improving air quality at the 24th Conference of the Parties (COP24) to the United Nations Framework Convention on Climate Change (UNFCCC).

Three products were launched at the event in Katowice, Poland (December 2018) will support Member States in developing policies to tackle climate change and its effect on health and well-being. One tool specifically addresses the quantification of health benefits from carbon reductions and shows that switching to low-carbon energy sources not only delivers direct health benefits through better air quality, but also offers many other opportunities to improve health. For example, introducing active transport options such as cycling helps to increase physical activity, which can help prevent noncommunicable diseases such as diabetes, cancer and heart disease.
The Carbon Reduction Benefits on Health (CaRBonH) calculation tool, developed by WHO and launched at COP24, allows for the quantification of the positive physical and economic consequences for health achieved through improvements in air quality from carbon reduction. As such, the tool aims to support Member States in developing informed policies for national mitigation actions and measures.

For further information and access to the tools and reports, please see here.