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## The mental work environment and social work environment on the senior workforce

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2022

*Document Version:*

Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for published version (APA):*

Nilsson, K., Nilsson, E., Jönsson, S., & Nilsson, M. (2022). *The mental work environment and social work environment on the senior workforce.*

*Total number of authors:*

4

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# 2<sup>nd</sup> international PEROSH conference on Prolonging Working Life

*Book of Abstracts*



National Institute of Occupational Health (STAMI, Norway),  
Central Institute for Labour Protection–National Research Institute (CIOP-PIB, Poland),  
Finnish Institute of Occupational Health (FIOH, Finland), National Research and Safety  
Institute for the Prevention of Occupational Accidents and Diseases (INRS, France),  
Italian Workers Compensation Authority (INAIL, Italy),  
Netherlands Organisation for Applied Scientific Research (TNO, Netherlands), and  
National Research Centre for the Working Environment (NFA, Denmark)

<http://www.perosh.eu/research-projects/perosh-projects/prolonging-working-life/>

<https://stami.no/perosh-2nd-conference-prolonging-working-life/>



## Introduction

Due to demographic changes across Europe, often referred to as the 'ageing society', there are strong political interests in maintaining the labour force by prolonging working life, through decreasing early exit from work and increasing the actual retirement age. However, exit from work is a complex and dynamic process, involving different factors (e.g., push, pull, stay factors) at different levels (individual, workplace, society).

The PEROSH project 'Prolonging Working Life' was initiated in 2018 and aims to determine push and stay factors regarding labour market participation of elderly workers across different European countries. The project wants to support and improve initiatives for preserving elderly workers at the labour market across Europe, considering different regulations and cultures.

As part of the project, the 1st International Conference for the PEROSH institutions and close collaborators was held in May 2020, as an online meeting, arranged by the National Research Centre for the Working Environment (NFA) in Copenhagen, Denmark.

The 2nd International PEROSH Conference will be arranged by the National Institute of Occupational Health (STAMI) in Oslo, Norway, 21–22 September 2022, as a hybrid conference, i.e. a physical meeting with the possibility of online participation.

<https://stami.no/perosh-2nd-conference-prolonging-working-life/>

The aim of this conference is to share knowledge and stimulate networking within the PEROSH institutions about the topic of prolonging working life.

*19<sup>th</sup> September 2022, on behalf of the PEROSH 'Prolonging Working Life' group*

### **Ingrid Sivesind Mehlum**

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Local Organizing Committee:

Ingrid Sivesind Mehlum, Karina Undem, Mariama Cham Evensen, Morten Wærsted

## Content

2 <sup>st</sup> international PEROSH conference on Prolonging Working Life .....	1
Introduction.....	2
Programme Overview.....	4
Day 1, 21 September 2022 .....	4
Day 2, 22 September 2022 .....	6
Keynotes.....	8
Ingrid Sivesind Mehlum (STAMI) .....	8
Emil Haals Sundstrup (NFA).....	8
Swenneke Van den Heuvel (TNO) .....	9
Svetlana Solovieva (FIOH).....	9
Lars Andersen (NFA).....	10
Short presentations.....	11
Short presentations on senior policy and age management .....	11
Short presentations - Online presentations I .....	14
Short presentations on occupational health and safety .....	19
Short presentations on psychosocial and organisational work factors .....	22
Short presentations - Online presentations II .....	26
Short presentations on sickness absence, exit from work and return to work .....	33

## Programme Overview

### Day 1, 21 September 2022

- 11:30–12:30 Registration & lunch (sandwich)
- 12:30–12:45 Opening by the hosting institution
- 12:45–13:15 **Keynote 1 by Ingrid Sivesind Mehlum (Norway)**  
Network on the Coordination and Harmonisation of European Occupational Cohorts (OMEGA-NET): Achievements and results of relevance to research on prolonging working life, after 4½ years of COST Action networking and collaboration.
- 13:15–13:45 Short presentations on senior policy and age management (10 min + 5 min questions)  
(Chair: Ingrid Sivesind Mehlum)
- Zofia Mockała (Poland):** Development of an intervention programme to increase wellbeing of ageing employees
- Mervi Ruokolainen (Finland):** Enhancing age management skills through peer learning – A randomized controlled trial among Finnish managers
- 13:45–14:15 Break
- 14:15–15:15 Short presentations - Online presentations I (10 min + 5 min questions)  
(Chair: Morten Wærsted)
- Elżbieta Łastowiecka-Moras (Poland):** Workload assessment of older women employed in the trade sector in Poland
- Emmanuelle Turpin Legendre (France):** Evaluation of physical functional capacities according to occupational exposures encountered during the professional career
- Magdalena Młynarczyk (Poland):** Older worker vs. heat load
- Kévin Desbrosses (France):** Effect of back-support exoskeletons on cardiorespiratory parameters during a repetitive lifting task
- 15:15–15:45 Break
- 15:45–16:15 **Keynote 2 by Emil Haals Sundstrup (Denmark)**  
New technologies: pros and cons for older workers. Overview of the international literature and new results from Denmark.

16:15–16:45 Short presentations on occupational health and safety (10 min + 5 min questions)  
(Chair: Elli Hartikainen)

**Bjørnar Finnanger Garshol (Norway):** Effects of the Labour Inspectorate Authority's Regulatory Tools on Psychosocial and Mechanical Work Factors – a cluster randomized controlled trial

**Nina Garthe (Germany):** The two sides of change intentions - the impact of leaving and staying with the employer on work, health and work ability

19:00 Dinner at Louise Restaurant & Bar  
Address: Stranden 3, Oslo

## Day 2, 22 September 2022

- 09:00–09:30 **Keynote 3 by Swenneke Van den Heuvel (The Netherlands)**  
Opportunities and limitations of research using European datasets to investigate relevant research questions about prolonging working life. Second report from this PEROSH project.
- 09:30–10:15 Short presentations on psychosocial and organisational work factors (10 min + 5 min questions) (Chair: Bjørnar Finnanger Garshol)
- Chris Attoe (United Kingdom):** Doctors' needs and support required for successful return to clinical work: A mixed-methods study
- Dagfinn Matre (Norway):** How can payroll data increase knowledge about a prolonged working life?
- Mikael Nilsson (Sweden):** Work environment and health in organizations during epidemics and pandemics caused by coronavirus
- 10:15–10:45 Break
- 10:45–12:00 Short presentations - Online presentations II (10 min + 5 min questions) (Chair: Morten Wærsted)
- Karen M. Oude Hengel (The Netherlands):** The impact of the COVID-19 pandemic on psychosocial work factors and emotional exhaustion among workers in the healthcare sector: a longitudinal study among 1,915 Dutch workers
- Karen M. Oude Hengel (The Netherlands):** Educational inequalities in self-rated health and emotional exhaustion among workers during the Covid-19 pandemic: a longitudinal study
- Kerstin Nilsson (Sweden):** The mental work environment and social work environment on the senior workforce
- Mirko Ribbat (Germany):** Enhancing workplace learning through job-design, leadership and organizational support
- Elżbieta Dobrzyńska (Poland):** 3D printing at workplaces – exposure to chemical substances and particles.
- 12:00–13:00 Lunch in STAMI cantina
- 13:00–13:30 **Keynote 4 by Svetlana Solovieva (Finland)**  
Nordic project (2016–2022): To what extent are work disability and exit from work preventable? Completing the Nordic Work Disability Database and utilizing it to look at occupation-specific prevention potential and working life expectancy

13:30–14:30 Short presentations on sickness absence, exit from work and return to work (10 min + 5 min questions) (Chair: Rachel Louise Hasting)

**Elli Hartikainen (Finland):** Working life expectancy and working years lost among users of part- and full-time sickness absence in Finland

**Uwe Rose (Germany):** Depressive symptoms as predictor of 5 year subsequent work non-participation in cohort of 2.413 employees

**Rune Hoff (Norway):** A national initiative for a more inclusive working life in Norway and its effect on return-to-work after sickness absence – a multi-state longitudinal cohort study

**Ingrid Sivesind Mehlum (Norway):** Hearing loss, sick leave, and disability pension: Findings from the HUNT follow-up study

14:30–15:00 Break

15:00-15:30 **Keynote 5 by Lars Andersen (Denmark)**

Overview of results from prospective studies from Denmark, e.g. SeniorWorkingLife and Healthy & Safe the Entire Working Life. Push and Stay factors for labour market attachment. Influence of age on the association between work environment and health.

15:30-15:45 Thank you and goodbye



## Keynotes

Ingrid Sivesind Mehlum (STAMI)



**Day 1, 21 September 2022, 12:45-13:15**

*Network on the Coordination and Harmonisation of European Occupational Cohorts (OMEGA-NET): Achievements and results of relevance to research on prolonging working life, after 4½ years of COST Action networking and collaboration.*

Ingrid Sivesind Mehlum is a Lead Senior Researcher at the National Institute of Occupational Health (STAMI), Oslo, Norway. In her research, she has focused on different topics in the field occupational health, including work participation, work disability, and work-related health, as well as their relations with occupational factors. She is involved in national and international projects and has been the Chair of the Network on the Coordination and Harmonisation of European Occupational Cohorts (OMEGA-NET), a COST Action (EU funded network). The keynote will present some achievements resulting from the collaboration and work of OMEGA-NET, with relevance to research on prolonging working life.

Emil Haals Sundstrup (NFA)



**Day 1, 21 September 2022, 15:45-16:15**

*New technologies: pros and cons for older workers. Overview of the international literature and new results from Denmark.*

Emil Haals Sundstrup is a Senior Researcher at The National Research Center for Work Environment in Copenhagen, Denmark. His research focuses on sustainable employability among older and younger workers, prevention of musculoskeletal disorders, and promotion of a good and healthy work environment. His current research activities focus on the rapid technological change that could mean that the working population, including older employees, must show an even higher degree of adaptability to be able to handle the working life of the future. At the same time, new technologies also have the potential for older workers to realize a long, healthy, and meaningful working life. By drawing on international studies and new results from Denmark, the keynote will discuss the impact of new technologies at work on labour market participation among older workers.

## Swenneke Van den Heuvel (TNO)



**Day 2, 22 September 2022, 09:00–09:30**

*Opportunities and limitations of research using European datasets to investigate relevant research questions about prolonging working life. Second report from this PEROSH project.*

Swenne G. van den Heuvel is a Senior Researcher at the Netherlands Organisation for Applied Research (TNO), the Netherlands. Her work experience includes national and international projects in the field of occupational health, in particular longitudinal studies on work-related musculoskeletal symptoms and psychosocial work characteristics. Her current research activities focus on the sustainable employability of ageing workers, but also on hybrid ways of working. She is the project manager of STREAM and CODI, both Dutch longitudinal studies aimed at sustainable employability, and of the NWCS (Netherlands Working Conditions Survey; NEA in Dutch), which is one of the largest periodical surveys on the labour situation of Dutch employees. The keynote will present one of the activities of the PEROSH working group 'prolonging working life', that was aimed at research opportunities using European datasets.

## Svetlana Solovieva (FIOH)



**Day 2, 22 September 2022, 13:00–13:30**

*Nordic project (2016–2022): To what extent are work disability and exit from work preventable? Completing the Nordic Work Disability Database and utilizing it to look at occupation-specific prevention potential and working life expectancy.*

Svetlana Solovieva is Adj Professor at Helsinki University and chief researcher at the Finnish Institute of Occupational Health. Her research focuses on prevention of work disability, particularly due to musculoskeletal diseases and mental disorders; enhancing work participation and prolonging working life; physical and psychosocial work-related factors, as well as combined exposures in the

work environment. The keynote will present Nordic collaborative project “To what extent are work disability and exit from work preventable?”. The project synthesizes knowledge from published studies with new results on the effect of the working environment on transitions between work, sickness absence (SA), temporary and permanent exit from the workforce, as well as on healthy working life expectancy, utilizing nationwide register and survey data from four Nordic countries.

Lars Andersen (NFA)



**Day 2, 22 September 2022, 15:00–15:30**

*Overview of results from prospective studies from Denmark, e.g. SeniorWorkingLife and Healthy & Safe the Entire Working Life. Push and Stay factors for labour market attachment. Influence of age on the association between work environment and health.*

Lars L. Andersen is professor at the National Research Centre for the Working Environment in Copenhagen, Denmark. His research focuses on healthy senior working life, musculoskeletal disorders, and physical and psychosocial work environment, as well as combined exposures in the work environment. The keynote will present Danish studies in relation to prolonging working life based on cohorts combined with high-quality registers on labor market participation. This includes the projects 1) Healthy and Safe the Entire Working Life, 2) Work After Pension-Age, and 3) SeniorWorkingLife. These projects investigate Push, Stay, Jump, Pull and Stuck factors among senior workers.

## Short presentations on senior policy and age management

**Day 1, 21 September 2022, 13:15-13:45**

# Development of an intervention programme to increase wellbeing of ageing employees

Zofia Mockała\*, Aleksandra Stachura-Krzyształowicz

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**Introduction:** Research suggests that developing psychological resources of older workers could be an opportunity for the global active aging trend (Hsu, 2018) and that increasing such resources in ageing population may be especially relevant in the context of COVID-19 pandemic (Kooij, 2020) and may lead to increase in wellbeing in general population (Lupsa et al., 2019). Meanwhile, it seems that ageing employees are quite rarely the subject of workplace interventions focused on psychological resources development (Gum et al., 2017).

**Aims:** The aim of this study was to develop an intervention programme to increase wellbeing of ageing employees.

**Methods:** Intervention programme was developed in 2020 and tested in 2021 in a group of Polish ageing employees from various organizations. It consisted of two-days workshops focusing on developing four factors of psychological capital: hope, optimism, self-efficacy, and resilience. Due to COVID-19 pandemic, workshops were conducted online. In total, 55 participants responded to the pre- and post-test questionnaires measuring psychological capital, wellbeing and selected psychosocial working conditions.

**Results:** The programme of the intervention will be presented and discussed at the conference as well as the results regarding its effect in the study group.

# Enhancing age management skills through peer learning – A randomized controlled trial among Finnish managers

Mervi Ruokolainen<sup>\*</sup>, Marjaana Pöyry, Telma Rivinoja, Terje Leivategija, & Jukka Vuori

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**Introduction:** The need for supporting aging employees' work ability and careers is widely acknowledged. However, there is lack of effective methods for managers to enhance their leadership skills related to age management.

**Aims:** To study the efficacy of a peer group-based training intervention focusing on improving managers' age management skills.

**Methods:** The data were collected in a randomly assigned field experimental study (RCT) between 2021 and 2022 among 215 managers. The study was conducted in 10 Finnish work organizations. The managers responded to online questionnaires before (T1), immediately (T2) and six months (T3) after the intervention. The intervention group participated in a web-based training in their own work organization. The training lasted nine hours and included three group meetings. The control group received similar training after the last follow-up survey (T3). The data collection is ongoing, and only the immediate effects of the intervention have been analysed.

**Results:** GLM for repeated measures showed that the intervention improved managers' age management skills as expected. The managers assessed their skills significantly better immediately after the intervention (T2) in the intervention group than in the control group. More specifically, the intervention improved managers' capabilities to 1) understand ( $p < .001$ ) and support ( $p < .001$ ) aging employees and their situations at work, 2) take better into account aging employees' strengths and work-related goals ( $p < .001$ ), 3) utilize organizational practices to support aging employees' work ability ( $p < .01$ ), and 5) improve co-operation between employees of different age ( $p < .001$ ). Furthermore, the managers who participated in the intervention reported more positive attitudes against aging employees than those in the control group ( $p < .05$ ).

**Conclusions:** Based on our results, we recommend peer group techniques for strengthening age management skills among managers. Next, we will focus on analyzing the long-term effects of the intervention reported by the managers and their employees.

## Short presentations - Online presentations I

**Day 1, 21 September 2022, 14:15-15:15**

# Workload assessment of older women employed in the trade sector in Poland

Elżbieta Łastowiecka-Moras

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**Introduction:** The results of studies on energy costs in various branches of industry indicate that still, in many workplaces, employees perform heavy physical work. In the retail sector, 40% of employees in Poland are over 50 years of age and women make up 70% of all individuals working in this sector. In the case of older women, in addition to the physiological differences dictated by their gender, there are also functional changes that occur in the human body with age, which significantly reduce the ability to perform physical work.

**Aim:** The aim of the study was to assess the workload of women aged 55+ performing physical work in the retail sector and to answer the question whether the physical capabilities of this group of workers are adequate for the requirements of their job.

**Methods:** Two types of studies were carried out in the group of 33 women. The scope of field tests included the assessment of workload resulting from dynamic and static effort and monotonicity, while the scope of laboratory tests included the assessment of aerobic capacity and selected motor skills.

**Results:** Based on energy expenditure measurements 84.8% of women performed work classified as heavy. The results of the assessment of static effort and the monotonicity of movements indicated an average degree of arduousness. A low level of the aerobic capacity reached 97% of subjects. The results of measurements of motor skills showed that the abilities of the studied women were within the limits of reference values for women aged 55+.

**Conclusions:** Contemporary studies indicate that there is no positive effect of high physical strain at work, especially in combination with a deficit of recreational physical activity in leisure time. In the analysed group, the workload resulted mainly from the dynamic efforts. Heavy work, combined with low aerobic capacity, may have increased the physiological cost of work and fatigue.



# Evaluation of physical functional capacities according to occupational exposures encountered during the professional career

**Emmanuelle Turpin Legendre**

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**Introduction:** Repeated and/or prolonged exposure to physical and psychosocial constraints weakens the employee, especially since the working life is getting longer. It is therefore essential to reduce the intensity of demands in the workplace and to maintain employees' capacities, in particular in work activities with high physical and psychosocial exposure, such as in the construction sector. Knowing the associations between the exposures encountered during the professional career and the capacities of the employees will allow the occupational health teams to identify the work situations at risk and to propose appropriate arrangements in order to prevent occupational wear and tear.

**Methods:** In collaboration with the Occupational Health Service of the Lorraine Building and Public Works Department, 153 volunteer male employees, aged between 20 and 50 years, were selected according to the intensity of the physical workload of the occupations in their career. Questionnaires relating to their exposure to physical and psychosocial constraints were developed. The physical functional capacities (PFC) of the participants were been evaluated using 13 tests.

**Results:** This study identified relationships between physical constraints and PFC, such as whole-body vibration and decreased motor coordination, squatting and decreased thigh muscles endurance, gripping effort and maximal voluntary grip force. Likewise, associations were found between psychosocial constraints and PFC, such as psychological demand and decrease in maximum shoulder strength, work recognition and better physical condition.

**Conclusion:** These results confirm the interest in studying past exposures in detail. This study highlights associations between physical and psychosocial constraints encountered during the professional career and PFC. These associations could serve as a reference for occupational health teams in the construction industry in order to identify the work situations at risk of early deterioration of health. Nevertheless, it seems necessary that the reproducibility of these associations can be confirmed a few years later, on the same population.

# Older worker vs. heat load

Magdalena Młynarczyk\*, Marzena Malińska

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**Aims:** The aim of the project was to check whether, and if so to what extent, the high temperature during exercise affects the load on the physiological body functions among elderly men.

**Methods:** The study participants were divided into two groups: 1/ten elderly men ( $61 \pm 1$  years old) and 2/control group - ten young ( $31 \pm 1$  years old) healthy and physically active men. Each participant took part in 2 variants of the study, taking into account physical effort at the level of 50% VO<sub>2</sub>max, in comfort (17°C) and hot environment (28°C). During the research, physiological indicators such as heart rate, oxygen uptake and energy expenditure (among others) were measured with an ergospirometer.

**Results:** During the exercise, elderly men obtained statistically significantly lower mean values of heart rate, oxygen consumption, energy expenditure and higher mean values of weighted skin temperature compared to the control group (younger men).

**Conclusions:** Due to age-related changes in the body, performing the same effort by young and old workers is much more burdensome in the group of older workers.

**Acknowledge:** This paper has been based on the results of a research task carried out within the scope of the fourth stage of the National Programme "Improvement of safety and working conditions" partly supported in 2017–2019 — within the scope of state services — by the Ministry of Family, Labour and Social Policy. The Central Institute for Labour Protection – National Research Institute is the Programme's main co-ordinator.

# Effect of back-support exoskeletons on cardiorespiratory parameters during a repetitive lifting task

SCHWARTZ Mathilde<sup>1,2</sup>, DESBROSSES Kévin<sup>1</sup>, THEUREL Jean<sup>1</sup>, MORNIEUX Guillaume<sup>2</sup>

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Low back pain remains an important issue in many companies. New technologies, such as back-support exoskeletons (BSE), have been specifically designed to prevent these kind of musculoskeletal disorders. Previous studies have shown that BSE could reduce lumbar muscles activity, depending in particular on the exoskeleton design. Despite the possible benefits on local muscle effort, few information is available about the effects of BSE on the overall physical workload. Thereby, the objective of this laboratory study was to assess the cardiorespiratory responses during a lifting task performed with the use of different BSE, with a special attention to their design.

14 women and 13 men performed a 5-min repetitive manual lifting task, with a 10-kg load, involving a full flexion/extension of the trunk in the sagittal plane. Four exoskeleton conditions were studied: with a passive exoskeleton (PASSIVE), with two active exoskeletons (ACTIVE\_1 and ACTIVE\_2), as well as without exoskeleton (FREE). Oxygen consumption rate and cardiac cost induced by the task were measured and analyzed using a general linear model with exoskeletons and sex as main effects ( $p < 0.05$ ).

The use of each exoskeleton (PASSIVE, ACTIVE\_1 and ACTIVE\_2) significantly reduced the oxygen consumption rate as compared to FREE. ACTIVE\_1 induced a decrease (-28%) significantly larger than PASSIVE (-7%) and ACTIVE\_2 (-13%). Compared to FREE, the reduction of the cardiac cost was significant only with the use of ACTIVE\_1 (-24%). In average, the oxygen consumption rate did not significantly differ between men and women, while women presented a significantly higher cardiac cost than men (+26%). No interaction effect between exoskeleton and sex has been reported.

Using BSE, whatever their design, reduced the overall physical workload associated to a repetitive manual lifting task. Nevertheless, the exoskeleton design, including the technology used (passive vs. active) and the level of anthropomorphism (related to the number of joints of the device), could explain the extent of the effects. The lack of interaction between exoskeleton and sex leads to the conclusion that these assistive devices provide benefits on the overall physical workload for both men and women.

## Short presentations on occupational health and safety

**Day 1, 22 September 2022, 16:15-16:45**

# Effects of the Labour Inspectorate Authority's Regulatory Tools on Psychosocial and Mechanical Work Factors – a cluster randomized controlled trial

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**Introduction:** High levels of sickness absence and disability retirement related to musculoskeletal pain and mental distress are prevalent in the health and social care services, especially in the home care services. These are also services that are facing increasing demands due to demographic developments, such as a growing elderly population. These increasing demands necessitates a focus on keeping maintaining the labour force, for example through delaying early exits due to disability retirement. A substantial number of cases of musculoskeletal and mental disorders are attributable to mechanical and psychosocial factors. One way of addressing such risk factors is through enforcing occupational health and safety legislation.

**Aims:** To determine the effects of the Labour Inspectorate Authority's regulatory tools on psychosocial and mechanical work factors in the Norwegian municipal home care services.

**Methods:** A cluster-randomized controlled trial conducted in the home care services with employee questionnaire data on psychosocial and mechanical work factors at baseline, and six- and 12-months post-interventions. 96 eligible municipalities were randomly assigned to either the control group or one of two interventions: 1) labour inspection visit, based on the Labour Inspectorate Authority's standard inspections; 2) guidance-through-workshop, where the participating services highlighted issues and trained labour inspectors provided guidance based on existing labour laws and regulations. At baseline the control group had 673 participants, inspection had 517, and guidance-through-workshop had 479.

**Results:** No substantial intervention effect was observed for the inspection-intervention. For the guidance intervention a preliminary effect was observed for the following psychosocial factors: decision control, control over work intensity, and empowering leadership. However, after adjusting for multiple testing, these were not statistically significant.

**Conclusion:** Labour inspections did not affect psychosocial and mechanical work factors in the homecare services. A preliminary effect of the guidance intervention on the control dimension of psychosocial work factors was observed. However, the effect was not evident after adjusting for multiple testing. The findings highlight the need to further develop how labour inspections and other regulatory tools can influence psychosocial and mechanical work-factors.

# The two sides of change intentions - the impact of leaving and staying with the employer on work, health and work ability

Nina Garthe\*, Hans Martin Hasselhorn

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**Introduction:** The political interests in the extension of working lives pose the challenge to older workers on how they can manage to work until, or possibly longer than the statutory retirement age. One strategy proposed to meet this challenge is employer change.

**Aims:** To examine leaving and staying with the employer among older workers in relation to health, work ability and psychosocial work factors.

**Methods:** In relation to employer changes, four groups of employees as elaborated by Hom et al. (2012) were distinguished: enthusiastic leavers (EL), reluctant leavers (RL), enthusiastic stayers (ES), and reluctant stayers (RS). The analyses were based on the data from the second and third waves (2014, 2018) of the German lidA Cohort Study, a representative study of employees born in 1959 or 1965. The employees' self-reported health, work ability and psychosocial work factors were examined over time using repeated Measures ANOVA.

**Results:** 7.1% of the employees changed employer between 2014 and 2018 voluntarily (EL), 6.4% involuntarily (RL). 13.2% stayed with their employer although they would have preferred to leave (RS). The four groups' self-reported health, work ability and psychosocial work factors already differed in 2014 and changed in different characteristic patterns over time. While EL reported substantial improvements after changing, RS reported poor outcomes in 2014, which further deteriorated while staying with the undesired employer.

**Conclusions:** On the one hand, employer changes have the potential to improve the employees' work, health, and work ability. On the other hand, involuntary stayers form a risk group to poor health, low work ability, poor working conditions and presumably low work participation. An inclusive labour market policy for older workers allowing for high job mobility might help to sustain health and work ability among older workers and thereby increase work participation of the older work force.

**Reference:** Hom PW, Mitchell TR, Lee TW, Griffeth RW (2012) Reviewing employee turnover: Focusing on proximal withdrawal states and an expanded criterion. *Psychol Bull* 138(5):831–858. <https://doi.org/10.1037/a0027983>

# Short presentations on psychosocial and organisational work factors

**Day 2, 22 September 2022, 09:30-10:15**

## Doctors' needs and support required for successful return to clinical work: A mixed-methods study

Chris Attoe<sup>1\*</sup>, Raluca Matei<sup>2</sup>, Kevin Teoh<sup>2</sup>, Caroline Kamau-Mitchell<sup>2</sup>

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**Introduction:** Pressures on the UK and international health services highlight the need to retain doctors and prolong careers. More than 5,000 UK trainee doctors are out of clinical practice at any time, many requiring support to return successfully. Guidance exists to support returners, although there remains limited evidence on their personal, social, and organisational needs to form evidence-based approaches. A recent review collated the evidence base and posited the core needs of returning doctors (Attoe et al., 2022), mapped to the IGLOO framework for sustainable return to work (Yarker et al., 2018).

**Aims:** To ascertain the needs of doctors returning to clinical work; and co-design a needs assessment tool to support successful return.

**Methods:** A cross-sectional mixed-methods design saw 265 UK doctors (79% female; 73% white) complete an online survey to assess the needs of returners, alongside effective change mechanisms, timepoints, and personnel for providing support. A sub-sample of 12 completed 45-60 minute semi-structured interviews on the same topics. Descriptive statistics and content analysis were used respectively.

Eleven doctors and professionals supporting returning doctors participated in three 60-minute co-design focus groups to create a needs assessment tool, based on UK Medical Research Council (2019) guidance on intervention design.

**Results:** Work design, emotional management, and self-efficacy were the primary individual needs, while support from peers and senior colleagues was most valued 3 months before and after return. Skill development, work adaptations, and feedback were effective change mechanisms. Certain reasons for return prompted higher scores on certain factors, such as childcare for returning parents.

The needs assessment tool, including user guide, objectives and action plan, was designed for returners to complete individually, with peers, or senior colleagues. General reflections preceded sections based on the IGLOO framework and identified needs.

**Conclusions:** Doctors needs across all reasons for return and career stages map well to the IGLOO framework as the basis for a needs assessment, co-created using clinical intervention design and participatory research methods. This intervention should be tested for feasibility and efficacy to determine its application to retain doctors and prolong their careers.



# How can payroll data increase knowledge about a prolonged working life?

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**Introduction:** Do older people require specific attention when it comes to working time arrangements? The results are conflicting. Ageing has been assumed to decrease the ability for circadian adjustment to night work. However, some studies also indicate that older age might be positive for shift work tolerance. To determine whether older people require specific attention when it comes to working time arrangements, accurate exposure data is essential. Payroll data contains this information and is already collected for millions of workers throughout Europe. Objective register-based algorithms for assessment of working time patterns for epidemiologic studies are needed. The proportion of workers older than 55-years is projected to increase. Ageing workers are often employed in the social and healthcare sector, providing services that require 24/7 work.

**Aims:** A national registry containing accurate information about daily starting and ending times at work

**Methods:** Daily working time data is stored digitally for approximately 1/3 of Norwegian workers by time registration companies (TRC). STAMI has been commissioned by the Ministry of Labor to retrieve data from a representative selection of these workers to a long-term national working time registry (NWR) available for research. The national identity numbers enable longitudinal studies and linking to other registries. A reference group of representatives from the authorities and social partners in Norway evaluates the project.

**Results:** Register-based measures assessing working time patterns for epidemiologic studies will enable us to evaluate the association between various shift schedules and adverse outcomes in different age groups.

**Conclusions:** Knowledge about sustainable working time schedules, and dissemination of this knowledge to social partners, employers, and authorities, will contribute to a prolonging working life.

# Work environment and health in organizations during epidemics and pandemics caused by coronavirus

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**Introduction:** The Swedish Agency for Work Environment Expertise commissioned researchers at Uppsala University and Stockholm University to conduct a systematic review focusing on the work environment during epidemics or pandemics caused by coronavirus.

**Aims:** To provide an overview of how work environment and occupational health are affected during epidemics and pandemics, and describe interventions designed to improve the work environment during epidemics and pandemics.

**Methods:** The guidelines on Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) were followed. The data bases Cinahl, Medline, PsycInfo, and Web of Science were searched for articles published until October 2020. Quality assessment was performed based on a modified version of the Mixed Methods Appraisal Tool (MMAT).

**Results:** After deduplication 3711 articles remained, of which 530 were selected for full text screening and 119 for quality assessment. After exclusion of studies with low quality 95 remained, of which 85 focused on healthcare personnel and 10 on employees in other industries; 73 used quantitative and 22 qualitative or mixed methods; the majority based on cross-sectional data. Studies derived from Asia, America, Europe, the Middle East, and Australia. Health care staff experienced an increase in job demands, poor leadership, and lack of resources (personal protective equipment, personnel, and competence). High demands and work with infected patients were associated with negative mental health outcomes. Evidence regarding interventions and for industries other than health care did not allow for solid conclusions.

**Conclusions:** Health care staff was negatively affected with respect to work environment and mental health. There is a lack of studies assessing interventions, studies from industries other than health care, and studies of high quality.

## Short presentations - Online presentations II

**Day 2, 22 September 2022, 10:45-12:00**

# The impact of the COVID-19 pandemic on psychosocial work factors and emotional exhaustion among workers in the healthcare sector: a longitudinal study among 1,915 Dutch workers

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**Aims** This study aims to investigate across subgroups of healthcare workers i) the changes in psychosocial working conditions and emotional exhaustion during the pandemic compared to the situation before, and ii) the impact of different stages of the COVID-19 pandemic in terms of hospital pressure on psychosocial working conditions and emotional exhaustion.

**Methods** The study is embedded within the longitudinal study 'the Netherlands Working Conditions Survey-COVID-19', with one measurement before the COVID-19 pandemic and three measurements during the COVID-19 pandemic. From this dataset, 1,915 healthcare workers were included. At each measurement, three subgroups were defined: working with COVID-19 patients, working with other patients, and not working with patients. For each measurement, hospital pressure was determined by number of hospitalizations per day. Linear mixed models were fitted to analyze differences across subgroups of healthcare workers.

**Results** Healthcare workers working with patients, in particular with COVID-19 patients, had more unfavorable psychosocial working conditions, i.e. less job autonomy and social support, and higher job and emotional demands, than healthcare workers not working with patients. Psychosocial working conditions deteriorated among healthcare workers working with and without COVID-19 patients compared to before COVID-19, but no changes were observed for emotional exhaustion in any of the subgroups. An increasing hospital pressure improved job autonomy and reduced emotional demands among healthcare workers in COVID-19 wards, but had no influence on other psychosocial working conditions and emotional exhaustion.

**Conclusion** Psychosocial working conditions deteriorated for healthcare workers working with (COVID-19) patients during the pandemic, while emotional exhaustion did not change among all groups of healthcare workers.

# Educational inequalities in self-rated health and emotional exhaustion among workers during the Covid-19 pandemic: a longitudinal study

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**Objective** This study aimed to investigate trends in educational inequalities in poor health and emotional exhaustion during the pandemic among workers, and whether this differed between men and women.

**Methods** Five waves (2019-2021) from the longitudinal study 'the Netherlands Working Conditions Survey COVID-19 study' were used (n=12,479 workers). Generalized logistic mixed models were used to estimate the changes in absolute and relative educational inequalities in poor health and emotional exhaustion for all workers, and stratified by gender.

**Results** Low and intermediate educated workers reported more often poor health (OR 2.54; 95%CI 1.71-3.77 and OR 2.09; 95%CI 1.68-2.61, respectively) than high educated workers. Intermediate educated women (OR 0.49; 95%CI 0.37-0.64) reported less emotional exhaustion than higher educated women, but no differences were observed among men. The prevalence of poor health first decreased across all educational levels between November 2019 and March 2021, and bounced back in November 2021. A similar pattern was found for emotional exhaustion, but for low and intermediate educated workers only. Relative educational inequalities in poor health reduced among men during the pandemic, and absolute differences decreased among men and women by 2.4-2.6%. Relative educational inequalities in emotional exhaustion widened among men and absolute differences in emotional exhaustion first increased among both men and women, but narrowed in the last wave.

**Discussion** Contrary to expectations, the prevalence of poor health and emotional exhaustion generally decreased during the pandemic, but returned to pre-Covid-19 levels. Educational inequalities in both outcomes showed different patterns, depending on relative or absolute differences.

# The mental work environment and social work environment on the senior workforce

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**Introduction:** The Swedish Agency for Work Environment Expertise commissioned researchers at Lund University, Kristianstad University and Malmö University to conduct a systematic review focusing on the impact of the psychosocial work environment on the senior workforce ( $\geq 55$  years of age) in a Swedish context.

**Aims:** To provide an overview of how psychosocial work environment and occupational health factors affect the senior workforce, and describe interventions designed to improve the work environment.

**Methods:** The guidelines on Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) were followed. The data bases: Pubmed, Cinahl, Scopus and Medline were searched for articles published until 2021-07-10.

**Results:** After deduplication 846 articles remained, of which 49 were selected for full text screening. After exclusion of studies with low quality 20 remained. The studies included in this literature review have been thematized and analysed based on the nine determinant areas of the swAge model<sup>1</sup>, for the ability and willingness to work in relation to ageing, to explain the complexity of predictors for the senior workforce's working life. These determinant areas are divided into predictors of: the work environment's effects on health; the personal financial situation; the social support, relationships, and participation; as well as the execution of work tasks and activities.

**Conclusions:** Several of the articles included in the literature review did not consider the definition of age in relation to the senior workforce, despite age being the factor that characterizes and distinguishes a senior employee. However, there were articles highlighting the significance of considering the senior workforce based on their biological age, social age, and cognitive age rather than just their chronological age (i.e. how many years had passed since they were born). Several general suggestions were discernable in the articles included in the literature review that will be discussed.

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<sup>1</sup> Kerstin Nilsson, A sustainable working life for all ages – The swAge-model, Applied Ergonomics, Volume 86, 2020

# Enhancing workplace learning through job-design, leadership and organizational support

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**Introduction:** Due to (digital) innovations and global trends, ongoing organizational transformations produce uncertainties for everyone involved. Structures, objectives and processes need constant revisions. Job demands change considerably and frequently. At the same time, the workforce in most industrialized countries is getting older. Thus, organizational support for the development of critical competencies and openness for change is one of the salient aspects for successful change.

**Aims.** We will demonstrate the importance of job designs, which enable informal workplace learning, and the relevance of learning-oriented leadership for employee well-being, work-ability and competencies. We will elaborate on beneficial organizational support features for learning and development, based on samples in public administration and private service organizations. Finally, we will provide ideas for integrating job design, leadership and organizational support for coping with increased job demands.

**Methods:** We conducted an online survey for employees ( $N = 538$ ) and supervisors ( $N = 144$ ) in 10 organizations from the public administration, banking and insurance sectors. In addition, we performed 25 exemplary workplace observations and interviewed 33 experts from the organizations involved. We used hierarchical regression analysis to test our hypotheses as for our quantitative data. For qualitative data, we used qualitative content analysis (Mayring, 2014).

**Results:** As expected, job characteristics enabling workplace learning (e.g., Hacker, 2003; Richter & Wardenjan, 2000) were positively related to competencies, self-efficacy, health, and work-ability. Learning-oriented leadership moderated the positive relationships of job characteristics with competencies and self-efficacy. The qualitative interviews revealed that the leaders' role for supporting employees' learning and development was often unclear within the organizations. We could identify organizational factors that were either supportive, hindering, or contradictory for learning and development.

**Conclusions:** Supervisors can enhance workplace learning and well-being in two ways, which is by supporting learning-oriented job design and by learning-oriented leadership behaviour. However, they need organizational support in order to fulfil this dual role. Consequently, we propose "learning contracts" (Dyer et al., 2018; Ribbat, 2020) as a concept that allows for integrating individual learning paths, a clear leadership role, and overall organizational goals.

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## 3D printing at workplaces – exposure to chemical substances and particles.

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**Introduction:** The possibilities offered by 3D printing technologies seem to be pushing the boundaries, both in terms of the widespread use of printing in practice and the increasing use of new materials. At the same time, these technologies can pose risks to user health, including those caused by potential emissions of chemicals and fine particles.

**Aims:** The project aims to identify the risks of additive manufacturing techniques in the work environment, by measuring chemical substances and particles released into the air at the 3D printer operator's workstation.

**Methods:** Measurements were carried out at the FDM printer operator's workstation using different types of filaments. Volatile organic compounds and phthalic acid esters were determined by gas chromatography-mass spectrometry. Carbonyl compounds were determined by high performance liquid chromatography with diode array detection. Fine particle emissions were studied using a DiSCmini particle counter (Testo).

**Results:** Filament monomers, their degradation products and potential additives were identified in air samples. Endocrine disruptors phthalic acid esters and carcinogens (mainly formaldehyde) were found among the emitted substances. Particle emission tests showed the release of particles with modal diameters ranging from 22.1 to 106.7 nm. The printing process increases the number concentration of particles in the air in all cases studied.

**Conclusions:** Materials used for 3D printing can release chemicals that pose a risk to the user. The emission of nanoparticles and the presence of carcinogenic and reprotoxic substances in air samples increases the risk estimated at the printer operator's workplace and requires appropriate preventive measures.

**Acknowledgements:** This paper is published and based on the results of a research task no. II.PB.06 carried out within the scope of the fifth stage of the National Programme "Improvement of safety and working conditions" supported from the resources of the National Centre for Research and Development. The CIOP-PIB is the Programme's main co-ordinator.

Short presentations on sickness absence, exit from work and  
return to work

**Day 2, 22 September 2022, 13:30-14:30**

# Working life expectancy and working years lost among users of part- and full-time sickness absence in Finland

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**Introduction:** Making use of partial working capacity of individuals with health problems has been seen as an important tool for prolonging working lives. Part-time sickness absence (pSA) instead of full-time sickness absence (fSA) is known to reduce the duration of sickness absence (SA), enhance return to work and increase subsequent work participation. Yet, its effect on the total length of working lives has remained unclear.

**Aims:** To carry out a quasi-experiment to assess the impact of the use of pSA instead of fSA on the length of working lives.

**Methods:** We used register data on a 70% random sample of the working-age population living in Finland on 31 December 2007 to form propensity score matched groups of users of pSA and fSA and to calculate their working life expectancy (WLE) and working years lost (WYL). We applied the Sullivan method based on daily measured time spent at work and other labor market statuses followed up over a four-year period until the end of year 2017. We restricted our study population to private and public sector employees with SA due to mental disorders and musculoskeletal diseases, i.e., the diagnostic groups where pSA has been primarily used.

**Results:** Among both genders, the pSA group had significantly higher WLE at age 30 years than the fSA group, with larger differences seen in mental disorders than in musculoskeletal diseases and in the private compared to the public sector. Overall, the pSA group had fewer WYL due to unemployment and disability retirement but more expected years working with partial disability benefits than the fSA group.

**Conclusions:** The use of pSA instead of fSA appears to lengthen working lives specially among persons with mental disorders and private sector employees. The more modest effect of the use of pSA due to musculoskeletal diseases is still considerable at the population level, since musculoskeletal diseases are one of the leading causes of work disability. Based on these beneficial working career effects, the use of pSA instead of fSA is recommended for persons with mental disorders or musculoskeletal diseases always when feasible.

# Depressive symptoms as predictor of 5 year subsequent work non-participation in cohort of 2.413 employees

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**Aims:** The present study addresses the effects of depressive symptoms on a) event-related aspects of absences and exits from paid employment together with b) the duration of these episodes.

**Methods:** We used data from a cohort study (2011/2012–2017), based on a random sample of employees subject to social contributions aged 31–60 years (Study on Mental Health at Work; S-MGA) who were re-assessed at follow-up five years later (N =2413). Depressive symptoms were obtained at baseline survey by paper questionnaire and employment history at follow-up interview. The effect of depressive symptoms on a) events of long-term sickness absence, unemployment and early retirements were analysed by logistic regression and b) associated duration in months by Generalized Linear Models (GLMs).

**Results:** The findings indicate that depressive symptoms have an effect on work non-participation in general and in particular on long-term illness among both genders and unemployment among men. Already mild depressive symptoms predicts later non-participation. The effect of the medium to severe depressive symptoms on unemployment and early retirement were not significant for females. The duration of total work non-participation were doubled for males with medium to severe depressive symptoms (B=2.06; 95% CI: 1.53–2.78) and more than a third higher B=1.38 (95% CI: 1.05–1.83) for females compared with the reference group.

**Conclusions:** From a practical and clinical point of view, the study indicates that the risk for – and duration of – non work participation increases for long term sickness absence in both genders, and among men also for unemployment. Also subclinical levels of depressive symptoms are a risk factor for work non-participation. The present study offers an approach that takes not only events of work non-participation into account, but also the duration of these episodes; both results are relevant for an assessment of the economic consequences of depressive symptoms on participation in working life. However, when assessing the economic consequences of depressive symptoms, it is not helpful to limit the analysis to only one type of work non-participation, such as early retirement.

# **A national initiative for a more inclusive working life in Norway and its effect on return-to-work after sickness absence – a multi-state longitudinal cohort study**

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**Introduction:** Sickness absence (SA) from work is an important long-term health outcome for the individual, as well as a social and financial burden for society. To reduce SA and increase work participation, the tripartite Agreement for a More Inclusive Working Life (IA) was established in Norway in 2001. IA companies were given measures to prevent and reduce SA. However, systematic evaluations of this initiative are sparse.

**Aims:** Estimate the average individual effect of having IA at the time of entering SA, on later return-to-work and other work-related outcomes for the following 500 days. A secondary objective was to study how effects varied between women and men, and individuals with either musculoskeletal or psychological diagnoses.

**Methods:** Every individual born in Norway 1967-1976 who entered full-time SA during 2004-2011, with limited earlier SA, were included (n = 187 930). Individual characteristics and longitudinal records of SA, work and education were obtained from linked population-wide registries. The average individual effects of having access to IA, were assessed using differences in state probabilities over 500 days, estimated by hazard-based multi-state models, adjusting for confounding by inverse probability weighting.

**Results:** IA increased the probability of work after entering SA, with the largest effect after 29 days (3.4 percentage points higher (95% confidence interval: 2.5 -- 4.3)). Difference in one-year expected length of stay was 8.4 more days (4.9 -- 11.9) for work, 7.6 (4.8 -- 10.3) fewer days in full-time SA and 1.6 (-0.2 -- 3.4) fewer days in non-employment. Similar trends were found within subgroups of sex and musculoskeletal and psychological diagnoses.

**Conclusions:** Working in an IA company improved individuals' return-to-work after a first long-term SA episode.

# Hearing loss, sick leave, and disability pension: Findings from the HUNT follow-up study

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**Background:** Evidence on the association between hearing loss and sick leave or disability pension is to a great extent based on few cross-sectional studies and remains unclear. We aim to assess the associations in a long-term follow-up population study.

**Methods:** We used baseline data from a large population-based hearing study in Norway, the HUNT Hearing study (1996-1998). The sample included 21 754 adults (48.5% men, mean age at baseline 36.6 years). We used register data on sick leave and disability pension (1996-2011). Cox regression was used to assess the association between hearing loss at baseline (Pure tone average/PTA 0.5-4 kHz >20 dB) and time to first physician-certified sick leave episode, as well as time to first disability pension payment.

**Results:** Hearing loss at baseline (yes/no) was weakly associated with time to first physician-certified sick leave episode: Hazard ratio (HR) 1.2 (95% confidence interval (CI) 1.1-1.3). Restricting the exposed group to people with both hearing loss and tinnitus, the HR was slightly increased: 1.3 (95% CI 1.1-1.6). The association did not depend on age, sex, education, or occupational class. Hearing loss in 1996-1998 was also associated with time to first received disability pension: HR 1.5 (95% CI 1.3-1.8). Stronger associations were found for disabling hearing loss (PTA >35). Restricting the exposure to hearing loss and tinnitus, the HR was increased: 2.0 (95% CI 1.4-2.8).

**Conclusions:** This large population-based cohort study indicates that hearing loss is associated with increased risk of receiving disability pension, especially among younger adults, low educated and white-collar workers. Hearing loss was weakly associated with sick leave.