perosh
PARTNERSHIP FOR EUROPEAN RESEARCH IN OCCUPATIONAL SAFETY AND HEALTH

HSE

PEROSH 2025
6th RESEARCH CONFERENCE
MANCHESTER

Book of Abstracts

9-11 September 2025, Manchester, UK

Core Technology Facility
46 Grafton Street, Manchester, M13 9NT, UK

www.perosh.eu

perosh
PARTNERSHIP FOR EUROPEAN RESEARCH IN OCCUPATIONAL SAFETY AND HEALTH

HSE

Contents

Cover image courtesy of University of Manchester

INTRODUCTION

The Partnership for European Research in Occupational Safety and Health (PEROSH), has held bi-annual research conferences exclusively for its members since 2015. These conferences are intended to provide both early-stage and experienced researchers with opportunities to present recent findings to colleagues from other PEROSH institutes, facilitate networking, and offer a platform for prospective international research project collaborations.

The first five PEROSH Research Conferences were held in Warsaw (2015), Sankt Augustin (2017), Copenhagen (2019), Madrid (2021), and Stockholm (2023). The 6th conference will take place in Manchester on 9-11 September 2025, with 105 participants registered and 49 abstracts submitted, including 11 from early-stage researchers.

We are pleased to announce six keynote speakers joining our colleagues from the PEROSH community.

We thank our host, the Health and Safety Executive (HSE), for organising this event.

The conference has three parallel sessions on the following themes:

1 - Disruptive Innovations in OSH

The first parallel session focuses on "Disruptive Innovations in OSH". This includes discussions on transformational technologies and their impact on improving workplace safety, health, and risk management. Example topics include the role of artificial intelligence in risk assessment, managing risks in hybrid and remote work environments, wearable technology for workplace health and safety, digital twins for occupational health and safety, Internet of Things (IoT) and smart sensors for hazard detection, virtual and augmented reality for safety training, resilience against biological risks, next-generation ergonomics and human-centred design, psychological safety in the digital age, and ethical and privacy considerations in the adoption of new technologies.

2 - New and Emerging OSH risks in the workplace

The second parallel session is centred on "New and Emerging OSH risks in the workplace". This session addresses evolving workplace hazards, emerging risks, and proactive safety strategies. Example topics cover occupational health and safety risks from emerging technologies, the rise of psychosocial hazards in modern workplaces, risks from new materials and processes, climate change and workplace safety, decentralised work environments and OSH, data-driven safety through big data and analytics, cyber-physical risks in digitalised workplaces, regulating the future with policies adapting to emerging technologies, generational workforce dynamics and emerging risks, and global collaboration on chemical safety standards.

3 - Chemical Safety Now and in the Future: Navigating Emerging Risks

The third parallel session, titled "Chemical Safety Now and in the Future: Navigating Emerging Risks", explores chemical safety innovations, emerging risks, and future-focused strategies. Example topics include emerging chemical risks with new hazards in novel substances, advances in chemical hazard assessment tools, the impact of climate change on chemical safety, regulatory evolution for new chemical risks, rationale for changes to exposure limits, the role of technology in chemical safety with automation and robotics, chemical safety in circular economies, occupational exposure to emerging toxicants, next-generation personal protective equipment (PPE), emergency preparedness and response for chemical incidents, and global collaboration on chemical safety standards.

This book of abstracts contains the final program, as well as the names and contributions of all speakers.

We encourage you to enjoy the conference and networking opportunities.

Steffen Bohni Nielsen
Chair PEROSH Steering Committee

Armin Windel
Vice Chair PEROSH Steering Committee

Margrethe Schøning
Chair PEROSH Scientific Steering Group

Jan Michiel Meeuwsen
PEROSH Director International Affairs

Image courtesy of Marketing Manchester

WELCOME

It is a great pleasure to welcome you to Manchester for this year's Partnership for European Research in Occupational Safety and Health (PEROSH) Scientific Conference. We are delighted to bring together colleagues from across Europe and beyond to share ideas, exchange knowledge and strengthen the partnerships that help make workplaces safer and healthier for everyone.

This year's event is particularly special for those of us who work for the Health and Safety Executive, as we are hosting this event in the fiftieth anniversary year of the Health and Safety Executive (HSE), Great Britain's health and safety regulator. Over the past fifty years, HSE has played a central role in transforming working lives, not only in Great Britain but also as a partner in global efforts to protect workers. Alongside this, PEROSH has grown into a strong and collaborative network of national research institutes, working across borders to provide the evidence base needed for healthier and safer work. Marking these milestones together reminds us that sustainable progress in occupational safety and health is always a shared achievement — built on collaboration, trust, and the free exchange of knowledge.

Manchester is a fitting host for such an occasion. A city with a proud industrial past, it has long been a place where innovation, science and social reform have gone hand in hand. From the factories of the industrial revolution to today's centres of research and technology, Manchester has been at the heart of practical examples of how work and society can change for the better.

The abstracts for this conference reflect that same spirit of progress. They showcase the creativity and dedication of researchers across the PEROSH network, tackling both enduring occupational risks and new and emerging challenges. Together, they highlight what can be achieved when we work across disciplines, borders and institutions towards the shared ambition of healthier and safer working lives.

As we celebrate fifty years of achievement, we also look forward. The world of work is changing rapidly, shaped by new technologies (including artificial intelligence), new forms of employment and new global challenges. The next fifty years will bring risks we cannot yet fully see, but also opportunities to protect and promote relevant health and safety solutions in ways that were once unimaginable. Research, innovation, and collaboration will be at the heart of that journey, and gatherings like this conference remind us of the strength we have when we work together.

On behalf of PEROSH and HSE, thank you for joining us. We look forward to the discussions ahead, to the partnerships strengthened here and to learning from each other so we can secure the future of occupational safety and health for the generations to come.

Prof. Andrew Curran CBE
Director of Science and
Chief Scientific Adviser
Health and Safety Executive

PROTECTING PEOPLE AND PLACES

PROGRAM

PEROSH 2025 – 6th Research Conference, Manchester
Venue: Core Technology Facility, 46 Grafton Street, Manchester, M13 9NT, United Kingdom

The names in red in a light orange box are of those competing for the early-stage researcher award.

September 9th, 2025, Preliminary Day

13:00-16:00	PEROSH Steering Committee meeting
14:00-18:00	Registration desk open
19:00	**Networking Dinner** Manchester Museum, Oxford Road, Manchester, M13 9PL

Image courtesy of Marketing Manchester

September 10th 2025 Research Conference

08:30-09:00 Registration

Moderator of the day: Andrew Curran, Director of Science and Chief Scientific Adviser, HSE

09:00-09:15 Welcome by Andrew Curran

09:15-09:30 Welcome by Margrethe Schøning, STAMI, Norway, and chair of the PEROSH Scientific Steering Group

09:30-10:00 Keynote 1: European Collaboration as a Pathway for Societal Impact and Academic Excellence, Steffen Bohni Nielsen, Director General of the Danish National Research Centre for the Working Environment – NFA, member of the Danish Research and Innovation Council and Chairman of PEROSH

10:00-10:30 Keynote 2: Health Work and Wellbeing. Where are we now? Professor Dame Carol Black, former principal Newnham college, Cambridge

10:30-11:00 Coffee and tea break

	Disruptive innovations in OSH *Chair: Derek Morgan*	**New and Emerging OSH risks in the workplace** *Chair: Yiqun Chen*	**Chemical Safety Now and in the Future: Navigating Emerging Risks** *Chair: David Johnson*
11:00	Virtual tour experience in OSH training: a case study for LOTO procedure *Alessia Williams (INAIL)*	Precarious work, psychosocial working conditions and job satisfaction as predictors of employee's wellbeing: what matters most *Szymon Warszawski (CIOP-PIB)*	Hydrogen Carrier Gas in GC-MS: A Sustainable Alternative to Helium for measuring PAHs in the Workplace *Godswill Akhigbe (HSE)*
11:20	Extended Reality in Ergonomics - Training with own Avatar *Norbert Lechner (AUVA)*	ALgorithmic MAnagement & Artificial Intelligence (ALMA-AI) systems as a new form of work organization: Psychosocial factors and implications for OSH based on statistical evidence in regular work. *Mairi Bowdler (TNO)*	Occupational exposure to micro- and nanoplastics in a plastic bottle recycling facility in Norway *Øyvind Pernell Haugen (STAMI)*
11:40	Chatbot as a support tool for accessing information on PPE – pilot *Agata Kmiecik (CIOP-PIB)*	Influence of climate change on the exposure to vectors that transmit infectious diseases at workplaces *Raquel Herencia Romero (INSST)*	Permeability of hazardous agents in cooling lubricants after application of occupational skin protection products *Magdalena Metzger (AUVA)*
12:00	An on-line OSH data exchange system for compliance *Antonis Targoutzidis (ELINYAE)*	From Flexibility to Fragility: Occupational Hazards in Platform Work *Adrian Todolí-Signes (SAWEE)*	Challenges and chances for occupational safety and health in circular economy *Nicoletta Godas (BAuA)*

	Disruptive innovations in OSH *Chair: Derek Morgan*	**New and Emerging OSH risks in the workplace** *Chair: Yiqun Chen*	**Chemical Safety Now and in the Future: Navigating Emerging Risks** *Chair: David Johnson*
12:20	SOFTEMA: A tool to assist in the development of safety-related application software for machines" *Albert Bohlscheid (IFA)*	Digital transformation: organisational resilience for managing new emerging OSH risks *Edvige Sorrentino (INAIL)*	Control of risk from stone dust containing high levels of crystalline silica *Chris Keen (HSE)*
12:40	Innovative tools in OSH info-training: Inail-Dimeila casestudies on road safety and climate change *Emma Pietrafesa (INAIL)*	Examining the expansive object of safety professionals' work in Finland *Riikka Ruotsala (FIOH)*	PEROSH-International Comparison of Sampling Strategies - Hazardous Substances (PEROSH-ICSS-HS) – an explorative feasibility study and first results with airborne wood dust *Christina Samel (IFA)*

13:00-14:00 Buffet Lunch

	Disruptive innovations in OSH *Chair: Derek Morgan*	**New and Emerging OSH risks in the workplace** *Chair: Yiqun Chen*	**Chemical Safety Now and in the Future: Navigating Emerging Risks** *Chair: David Johnson*
14:00	Evaluation of the load on bicycle delivery services using the 3D-musculoskeletal-model "Myonardo" *Norbert Lechner (AUVA)*	Silence and Cultures of Silence in Working Life *Annette Nylund (SAWEE)*	Embedding Behavioural Safety in the Green Transition: A Participatory Approach to Reducing Biological Exposure among Waste Collection Workers *Marie Svensmar Krag (NFA)*
14:20	Ergonomic Challenges of Working with Display Screen Equipment *Joanna Kamińska (CIOP-PIB)*	Downsizing and mental distress *Eirik Degerud (STAMI)*	Development of high-volume personal aerosol sampler *Marcel Dörr (IFA)*
14:40	From Past Insights to Future Challenges in the Age of Digital Transformation: A Scoping Review on Labour Inspectors *Swantje Robelski (BAuA)*	Ethical and legal challenges on the use of artificial intelligence management of workers *Adrian Todolí-Signes (SAWEE)*	Occupational exposure and inflammatory potential of bioaerosols in the food industry *Christine Darbakk (STAMI)*
15:00	Adopting occupational exoskeletons: from initial interaction to long-term use *Liên Wioland (INRS)*	Risk Assessment Approach for Industrial AI Systems Based on Established Industry Methods – First Steps *Colin Chambers (HSE)*	Sentinel Network of Oncology Specialists for Detecting the Occupational Origin of Paranasal Sinus Cancer Cases *Carina Liarte Zwaan (INSST)*

	Disruptive innovations in OSH *Chair: Derek Morgan*	**New and Emerging OSH risks in the workplace** *Chair: Yiqun Chen*	**Chemical Safety Now and in the Future: Navigating Emerging Risks** *Chair: David Johnson*
15:20	Improvements in the determination of diisocyanates using a new gradient elution HPLC methodology *James Forder (HSE)*	How Fraud and Undeclared Work Degrade Work Environments and Exploit Workers across Different Industries: A Literature Review *Monica Kaltenbrunner (SAWEE)*	Addressing emerging challenges in the surveillance of occupational cancer: the Italian model of integrated monitoring systems *Alessandro Marinaccio (INAIL)*
15:40	Balancing Accuracy and Wearability: Sensor Configuration Strategies for Real-World Near-Fall Detection *Moritz Schneider (IFA)*	The Futures 2 project: a comparative analysis of PEROSH researchers priorities and national OSH strategies to assess the impact of health, social and economic changes on future research. *Bruna Maria Rondinone (INAIL)*	Using Drones to Apply Plant Protection Products: work to understand potential exposure routes and risks to operators *Tony Wilson (HSE)*

16:00-16:30 **Break**

16:30-17:00 Keynote 3: The Health and Occupation Research (THOR) network: 35 years of occupational disease data in the UK, Professor Martie van Tongeren, University of Manchester

17:00-17:30 Keynote 4: NIOSH under constraints: what's at stake for occupational health & safety? Lyne Sauvageau, Chief Executive Officer of the Robert Sauvé Research Institute in Occupational Health and Safety (IRSST)

18:00 **Drinks and Nibbles**
Eighteenth floor, Hyatt Regency Manchester, 55 Booth St W, Manchester, M15 6PQ

Image courtesy of Marketing Manchester

September 11th 2025 Research Conference

8:00 Registration desk open

	Disruptive innovations in OSH *Chair: Derek Morgan*	**New and Emerging OSH risks in the workplace** *Chair: Yiqun Chen*	**Chemical Safety Now and in the Future: Navigating Emerging Risks** *Chair: David Johnson*
09:00	Discovering Safety's Construction Risk Library - A knowledge tool to support design risk treatment on construction projects *Steven Naylor (HSE)*	Lessons Learned from the COVID-19 Pandemic for Occupational Safety and Health; An International Comparison *Robert Ljung (SAWEE)*	How to reduce the constantly rising climate risk due to solar UV-exposure in occupational settings at high risk *Claudine Strehl (IFA)*
09:20	OSH for All? Exploring the Role of LLM-based Chatbots in Enhancing Access to Health and Safety Information *Swantje Robelski (BAuA)* *Marie Jelenko (AUVA)*	What about the effects of climate change on workers' health? *Angeles de Vicente (INSST)*	Potential exposure to airborne nanomaterials generated from 3-D printing processes *Fabio Boccuni (INAIL)*
09:40	Smarter Regulatory Sandbox - exploring opportunities to improve health and safety using AI and technology *Helen Balmforth (HSE)*	Sick leave and occupational status. A decomposition analysis from Norway. *Ståle Østhus (STAMI)*	Design and investigation of a high flow respirable sampler *Dzmitry Misiulia (University of Kaiserslautern-Landau; on behalf of IFA)*
10:00	Workers' Participation, Representation and Prevention in the Digital Era: Evidence from National Case Studies *Giuliana Buresti (INAIL)*	The Impact of Remote Work on Gender Equality in the Labour Market: Quantitative Findings from Sweden and a Systematic Review of International Research *Johan Stenmark (SAWEE)*	MCDA-assisted chemical alternatives assessment based on input data generated using the SSbD toolbox *Eero Lantto (FIOH)*
10:20	AI-supported electron microscopy analysis of occupational asbestos exposure concentrations: Needs and state of play *Keld Alstrup Jensen (NFA)*		

10:40-11:00 Coffee and tea break

Moderator of the day: Andrew Curran

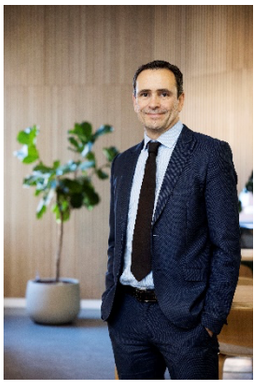
11:00-11:30 Keynote 5: EU-OSHA; a new strategy and new ambitions, William Cockburn Salazar, Executive Director of the European Agency for Safety and Health at Work, Bilbao, Spain

11:30-12:00 Keynote 6: Current Occupational Health Challenges in South Africa, with a Focus on Psychosocial Risks. Professor Spo Kgalamono, NIOH Executive Director, South Africa

12:00-12:15 Announcement winner of the early-stage researcher award

12:15-12:30 Conclusion and closing of the conference

KEYNOTE SPEAKERS



Steffen Bohni Nielsen
NFA
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National Research Centre for the Working Environment

Bio sketch

Dr. Steffen Bohni Nielsen is Director General of the Danish National Research Centre for the Working Environment – NFA. He is also a member of the Danish Research and Innovation Council and Chairman of PEROSH. He has previously held executive positions in local and national government and in the management consulting industry. He has published extensively on evaluation, public management, artificial intelligence, and the societal impact of research.

"European Collaboration as a Pathway for Societal Impact and Academic Excellence"

In this keynote presentation Steffen Bohni Nielsen presents the key tenets in PEROSH's strategy. Each PEROSH member hold a particular position in the national occupational health and safety systems with a mission to produce, procure, and disseminate evidence. Yet, impacting policy and practice is fraught with challenges. He will highlight how European collaboration can function as a lever for both academic excellence and societal impact of research within and across national borders.

Dame Carol Black
Former Principal of Newnham College, Cambridge
profblack@btinternet.com

Bio sketch

Initially a clinician and medical scientist, Carol became the Director of the Centre for Connective Tissue Disorders at the Royal Free Hospital, the second woman President of the Royal College of Physicians, and Chair of the Academy of Medical Royal Colleges. The Centre she established at the Royal Free is internationally renowned for research and treatment of scleroderma. She was appointed CBE in 2002, a DBE in 2005, and in 2024 she was appointed GBE for public service.

She chaired the Nuffield Trust for policy studies and wrote three influential independent reviews for Government on workers' health and sickness. In 2021 she published a fourth independent review, on illicit drugs, demand, supply, treatment and recovery, leading to a 10-year strategy with substantial government investment. A former Principal of Newnham College, Cambridge, she is now Chair of the British Library and the Centre for Ageing Better.

"Health Work and Wellbeing. Where are we now"

This talk will look at the progress, gaps and challenges in the years since the publication of Working for a Healthier tomorrow in 2008. In the intervening years there has been much political societal and technological change, a financial crisis, years of austerity, a pandemic, wars and much more. Where are we now and what needs to be done?

Martie Van Tongeren
University of Manchester
Martie.J.Van-Tongeren@manchester.ac.uk

Bio sketch

Professor van Tongeren is an experienced occupational and environmental health epidemiologist. He leads an interdisciplinary team (Centre for Occupational and Environmental Health) at the University of Manchester and is also affiliated with the Thomas Ashton Institute for Risk and Regulatory Research. He carries out a wide range of interdisciplinary research on occupational and environmental determinants of health. He is the Principal Investigator for The Health and Occupation Research network (THOR), collecting data on occupational disease in the UK in order to identify trends and identify potential sentinel cases.

"The Health and Occupation Research (THOR) network: 35 years of occupational disease data in the UK"

The Health and Occupation Research (THOR) network has been collecting data on occupational diseases in the UK since 1989, with its database now comprising over 115,000 cases. Currently, data are reported by chest physicians, dermatologists, and occupational physicians. It offers critical insights into long-term trends in occupational diseases, the emergence of new sentinel cases, and the effectiveness of policy interventions. This presentation will describe the unique and invaluable role THOR has in informing occupational health policy and practice in the UK and will highlight some key findings, including trends in work-related stress, the emergence of silicosis linked to engineered stone, and cases of dermatitis associated with metal exposure.

Lyne Sauvageau
IRSST
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Bio sketch

Chief Executive Officer of the Institut de recherche Robert-Sauvé en santé et en sécurité du travail (IRSST) since August 2019, Lyne Sauvageau holds a PhD in Public Health from the Université de Montréal and a master's degree in Political Science from Université Laval. Over the course of her career, she held key positions in research administration. From 2011 to 2019, she served as Vice President Academic and Research at the Université du Québec, following a tenure at the Fonds québécois de la recherche sur la société et la culture, as Vice President of Programs (2004–2010). Committed to advancing knowledge and innovation, Ms. Sauvageau has actively contributed to numerous organizations, serving on the boards of ACFAS, the Fonds de recherche du Québec – Santé, and the Canadian federation for the Humanities and Social Sciences.

"NIOSH under constraints: what's at stake for occupational health & safety?"

The deep financial cuts to public research funding, along with unprecedented attacks on universities, academic freedom, and public scientific institutions under the Trump administration, have severely undermined the foundations of knowledge production and evidence-based decision-making in the United States. As of the end of July 2025, NIOSH has already lost half of its workforce, is anticipating major budget reductions and the discontinuation of mission-critical programs in 2026, and is facing the prospect of being dissolved as a standalone entity within the CDC. What do these developments mean for us—as researchers and leaders of science-based occupational safety and health institutions? This address will explore avenues for action, among them, maintaining public and stakeholder confidence in science and research, promoting international collaboration and the sharing of research infrastructure, elevating the role of researchers in public discourse and policy engagement. In a world facing health, climate, and deepening social and economic inequalities, restoring science and research within the core of public decision-making and sustainable development is more important than ever.

William Cockburn Salazar
EU-OSHA
cockburn@osha.europa.eu

Bio sketch

William Cockburn has worked at the European Agency for Safety and Health at Work (EU-OSHA) since 1998 where he was responsible for the first European survey of enterprises on new and emerging risks (ESENER). After nine years in charge of EU-OSHA's Prevention and Research Unit, William took the position as EU-OSHA´s Executive Director. Born in the UK, William trained first as a lawyer and then as an ergonomist. Prior to joining EU-OSHA, he worked in academic research investigating company safety culture and in the private sector as an ergonomics consultant and research manager for projects in health and safety at work.

"EU-OSHA; a new strategy and new ambitions"

As the EU's information Agency for safety and health at work, EU-OSHA plays an important role supporting policy-making and regulation, workplace risk prevention and raising awareness. As the EU sets its sights on increasing competitiveness, it faces significant challenges in the green and digital transitions and an ageing population. What role is there for health and safety at work as the current European Strategic Framework nears its end? EU-OSHA's new strategy, fresh data from its surveys, and a new campaign on the horizon aim to give OSH a boost… but success depends on everyone working together and PEROSH has a key role to play.

Spo Kgalamono
NIOH
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Bio sketch

Prof Spo Kgalamono is the Executive Director of the National Institute for Occupational Health (NIOH), a Division of the NHLS responsible for providing specialised occupational health services, capacity building and conducting research to make recommendations for the prevention of work-related diseases in all economic sectors.

Prof Spo is also a Professor and Chair of Occupational Health at the University of the Witwatersrand in the School of Public Health. Her contributions to the field of occupational health are marked by numerous publications and membership in several technical committees, locally and abroad. Her professional interests include capacity development and mental health in the workplace.

"Current Occupational Health Challenges in South Africa, with a Focus on Psychosocial Risks."

South Africa continues to face persistent occupational health challenges, including injuries, hazardous exposures, limited service access, the rise of the gig economy, and the ongoing burden of disease within a weakening economy. Increasingly, psychosocial risks are recognised as a critical dimension of worker health. Drivers such as job insecurity, long working hours, bullying, workplace violence, stigma, and high stress levels fuel mental health concerns across both formal and informal sectors. Despite their profound impact on productivity, absenteeism, and overall wellbeing, these issues remain under-recognised and inadequately addressed. Moreover, the high burden of occupational disease externalised to an overstretched public health system underscores that sound policies without intentional implementation fall short of protecting workers. This presentation will highlight current occupational health challenges in South Africa, with emphasis on psychosocial risks, and discuss the urgent need for practical, locally relevant policies, stronger workplace accountability, and collaborative strategies to safeguard both the physical and mental health of the workforce.

PARALLEL SESSION SPEAKERS

Adrián Todolí-Signes
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Swedish Agency for Work Environment Expertise

Bio sketch

Dr. Adrián Todolí-Signes is a full professor of Labor Law at the University of Valencia. Degree in Economics and Law. He has published more than a hundred academic outcomes (including articles in peer-reviewed journals, book chapters, edited books and monographs). He has extensive experience in Regulating the Digital Economy from a legal and economic perspective. He has published several articles in international journals and a book on Platform work and algorithmic management and has been invited to give lectures in platform economy at universities in several countries and at international startup forums. One in particular that worth to be mentioned is titled "Making algorithms safe for workers: occupational risks associated with work managed by artificial intelligence" and the book published by HART Labour Law and Economic Policy. How employment rights improve the economy.

Winner of the award for the best young lawyer awarded by the Spanish Labor Forum (FORELAB). Winner of the Prize for the Best Research in Labor Law granted by the Spanish Association of Labor and Social Security Law (AEDTSS) twice, in 2015 and 2016 on issues of dual professional training and evaluation of performance and compensation. As a national expert, he has collaborated with the European Commission on youth employment and Gig economy regulation (DG Employment) and he has been appointed expert on platform work by the ILO.

"Ethical and legal challenges on the use of artificial intelligence management of workers"

This study analyses the ethical and legal challenges of the implementation of Artificial Intelligence to make automated and semi-automated decisions affecting workers and their interaction with the work environment. In this context, first, it synthesizes the available knowledge on the challenges to the workers' fundamental rights, as well as, ethical challenges on the introduction of IA at the workplace. Second, it highlights the emergence of unregulated areas that could require new public policies or social partners intervention at the workplace. Third, it identifies the policies proposed by the literature to regulate these areas.

This presentation is based on research work being done for SAWEE.

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Swedish Agency for Work Environment Expertise

Bio sketch

Dr. Adrián Todolí-Signes is a full professor of Labor Law at the University of Valencia. Degree in Economics and Law. He has published more than a hundred academic outcomes (including articles in peer-reviewed journals, book chapters, edited books and monographs). He has extensive experience in Regulating the Digital Economy from a legal and economic perspective. He has published several articles in international journals and a book on Platform work and algorithmic management and has been invited to give lectures in platform economy at universities in several countries and at international startup forums. One in particular that worth to be mentioned is titled "Making algorithms safe for workers: occupational risks associated with work managed by artificial intelligence" and the book published by HART Labour Law and Economic Policy. How employment rights improve the economy.

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"From Flexibility to Fragility: Occupational Hazards in Platform Work"

This paper provides a comprehensive review of the existing literature on occupational hazards in platform work and their impact on workers' health. It begins by synthesizing the current body of knowledge on the specific risks associated with platform-based employment. Subsequently, the study examines the documented relationships between these occupational hazards and the health outcomes of platform workers. Through a critical analysis of the literature, the paper identifies key research gaps and areas requiring further investigation. Finally, it highlights the main contributions found in the literature regarding strategies and measures to mitigate risk factors and improve working conditions in the platform economy. The findings aim to inform future research and policy initiatives to enhance the protection of platform workers' health and safety.

Agata Kmiecik
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Bio sketch

My name is Agata Kmiecik and I'm a research and technical specialist at Central Institute for Labour Protection – National Research Institute in Poland. I studied applied computer science with a specialization in UI/UX, and I'm interested in how people interact with technology. I'm using this experience in my work by focusing on designing user-centered solutions. In my presentation, I'll be talking about a chatbot that we developed in topic of personal protective equipment and the user research behind it.

"Chatbot as a support tool for accessing information on PPE – pilot"

In the era of growing digital transformation, any Internet-based tool, for example a conversational agent (chatbot) can become increasingly important. One of the areas where this type of solutions can be applied is information on personal protective equipment (PPE). Our analysis shows the lack of solution for a quick access to reliable information on PPE. Traditional web searching takes a lot of time and it is hard to quickly find reliable sources of information on such important topic. The perceived lack of ability to easily obtain information on PPE was the reason for CIOP-PIB to take actions aimed at creating a tool that would allow easy access to this kind of information for a wide audience by creating a chatbot. The tool is designed taking into account the user's objectives, needs and feedback. At first we focused on a smaller part of PPE – protective clothing against chemical and infective agents. By engaging its users and manufacturers, we've gathered information on what needs to be in the chatbot's database, how should it work and what interface design is the most suitable. The developed chatbot has been subjected to basic usability testing to identify issues and improve the user experience of the final product. The chatbot has a lot potential to be used as a support in the field of occupational safety.

Author and co-authors

Authors: Monika Jangas[1], Agata Kmiecik[1], Anna Dąbrowska[1]
[1]Central Institute for Labour Protection – National Research Institute

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IFA
Institut für Arbeitsschutz der
Deutschen Gesetzlichen Unfallversicherung

Bio sketch

Albert Bohlscheid holds a master's degree in computer science & engineering and works as a research associate at IFA in the division of Accident Prevention – Digitalisation and Technologies. His team conducts research in the field of new technologies and machine safety. He focuses on safety-related application software (SRASW) used in machinery and investigates methods for its reliable and standards-compliant development.

"SOFTEMA: A tool to assist in the development of safety-related application software for machines"

The SOFTEMA software tool, developed by the Institute for Occupational Safety and Health of the German Social Accident Insurance (DGUV), helps with the development, specification, verification and documentation of safety-related application software (SRASW) for machines and supports standard-compliant implementation. It offers a structured, verifiable method and reduces errors through automated validation. Excel-compatible project files simplify integration into existing workflows. At the heart of the tool is the IFA matrix method, which was developed with the Bonn-Rhein-Sieg University of Applied Sciences and uses a cause-and-effect matrix (C&E matrix) to describe logical links between input and output levels. This supports precise, transparent documentation of safety requirements. The SOFTEMA code visualiser is based on the IEC 61131-3 standard, which defines function block diagrams (FBD) as the standard for programming programmable logic controllers (PLCs). This enables the complex shutdown logic to be represented visually, making it easier to identify and avoid logic errors. A code generator automatically converts the links defined in the C&E matrix into program code and supports the PLC programming languages FBD and Structured Text (ST). The code is exported in the manufacturer-independent PLCopen XML format, enabling simple integration into various PLC environments.

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Bio sketch

Alessandro Marinaccio is an epidemiologist and research director at INAIL (Italian National Workers' Compensation Authority). He leads the Laboratory of occupational and environmental epidemiology and the Italian national mesothelioma registry (ReNaM). His research fields are the occupational epidemiology with a focus on the occupational cancer and occupational diseases surveillance systems.

"Addressing emerging challenges in the surveillance of occupational cancer: the Italian model of integrated monitoring systems"

Occupational cancers, particularly those with a low attributable fraction, represent a persistent yet often under-recognized threat in modern workplaces. The evolving nature of occupational exposures, linked to new materials, complex production processes, and changing work environments, make it harder to detect and prevent these diseases early.

To face these challenges, Italy has created a structured national surveillance system that brings together different data sources, cancer registries, exposure databases, and insurance records, to improve the monitoring of work-related cancers.

The system comprises two synergistic components: the National Occupational Cancer Registry which monitors cases of suspected occupational cancers, using different methods to detect high and low attributable fraction tumors, and the SIREP database, which systematically collects data on occupational exposures to carcinogens. The integration of these datasets allows for the identification of exposure-disease relationships in real-world settings and supports the proactive recognition of new occupational risk scenarios.

This work emphasizes the need for innovation not only in surveillance tools, but also in collaboration across sectors, data sharing, and training of professionals. Using big data, improving digital systems, and strengthening cooperation at the European and international level are key to updating how we monitor occupational cancers. The Italian model provides useful insights for building flexible, evidence-based strategies to manage the changing risks of cancer at work.

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Bio sketch

Alessia Williams is an INAIL researcher at the Department of Occupational and Environmental Medicine, Epidemiology and Hygiene and has a degree in Political Science and a master's degree in 'Human Resources Management and Training'. As of today, Alessia deals with health and safety at work with particular reference to the training of prevention figures and their professional updating; is an expert in innovative and digital teaching methods and is a professional trainer in the field of health and safety in the workplace.

"Virtual tour experience in OSH training: a case study for LOTO procedure"

This scientific research aims to show how is possible to develop the OSH training to face the challenges that the digital technologies presents. To prevent injuries and accidents, organizations needs to leverage education and training: traditional training is no longer enough in this moment of transforming environment. In this context, Virtual Reality (VR) has emerged as a powerful tool that enables the simulation of hazardous scenarios, allowing workers to engage in experiential learning without exposure to real dangers. This approach leverages a "learning-by-doing" model, which enhances both engagement and skill acquisition. Despite its potential, the literature indicates a lack of systematic approaches for designing OSH training interventions using VR. Addressing this gap, the Fereo project - focused on Organizational Training and Resilience Engineering with New Enabling Technologies (Bric Inail 2022-ID63) - has developed a VR-based training program to improve safety practices. A key objective of this project is to design, implement, and evaluate the effectiveness of a VR Tour centered on the LOTO (Lock Out-Tag Out) procedure for machine and plant maintenance. The training is structured using the Skill-Rule-Knowledge framework to optimize information delivery while considering factors such as attention, response time, memory, and hand-eye coordination. The VR Tour includes three distinct scenarios: "Trial & Error", "LOTO & Variability", "Supervisor Training". An evaluation protocol incorporating control groups and questionnaires has been developed to assess the system's usability, cognitive load, space presence and cybersickness. This project aims to enhance workplace safety culture and provide actionable guidelines for designing effective VR-based as a solution. The outcomes are expected to advance both the quality and applicability of OSH training while promoting safer work environments.

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Bio sketch

I am a pharmacist specialized in occupational health and statistics. For 23 years, I have been researching on occupational health, as well as training INSST technical staff in research methodologies. Over the past year, I have worked with my colleagues to determine occupational risks that are emerging or changing because of climate change.

"What about the effects of climate change on workers' health?"

Study framed within the Spanish OSH Strategy 2023-27. The objectives of the research are to characterize occupations that work mostly outdoors and to identify and analyse their occupational risks (OR) derived from climate change (CC). A methodological triangulation was used: 1. Statistical analysis of the labour force survey and occupational accidents. 2. Review of the grey and scientific-technical literature, categorizing OHS into six groups. 3. Interviewing experts from different sectors, landing the study of the consequences of CC on these occupations in the Spanish reality.

CC intensifies existing OR and generates new ones. Physical risks, such as extreme temperatures and ultraviolet radiation (UVR), increase cardiovascular and skin diseases. Biological risks increase with the spread of vectors that transmit diseases such as leishmaniasis and Nile fever. Chemical risks, with exposure to contaminants or pesticides, increase respiratory and skin diseases. Ergonomic risks are aggravated by handling loads in high-temperature environments. Safety risks are also amplified by increasing the number of occupational accidents, as well as the frequency of fires and avalanches. On the psychosocial side, work pressure and stress increase during extreme weather events, affects to emergency and security sectors. Emerging risks stand out during floods, prolonged droughts or fires. Post-event reconstruction and clean-up work multiply exposure to hazardous materials and unhealthy spaces.

As a result of the research, individualised fact sheets have been developed to support the identification of effects of CC on vulnerable groups of workers. CC is a generator and amplifier of certain OR. In Spain, the most affected sectors are primary sector, construction, emergency services and cleaning. Adaptation to these risks requires updated preventive strategies such as epidemiological surveillance prevention training, monitoring technologies and improvements in protective equipment.

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Swedish Agency for Work Environment Expertise

Bio sketch

Significant employment experiences before the Swedish Agency for Work Environment Expertise, SAWEE, were as a senior analyst at the Swedish Work Environment Authority, the Department for Statistics and Analysis, and previously, the former Swedish Institute for Growth Policy Analyses, ITPS, and before that, the former National Board for Industrial and Technical Development, NUTEK. Education: Ph.D. in work science at Luleå University, Ph. Lic. in industrial work science at KTH Royal Institute of Technology, BSc. in economics and political science.

"Silence and Cultures of Silence in Working Life"

Issues about a silent culture in organisations are noted. However, the concept has been used vaguely, and a lack of conceptually well-developed methodology exists to measure its occurrence.

Three scientifically based reports will be published:
The first is a literature review that develops a framework for understanding, measuring and preventing workplace silence cultures. A supplemented model for studying organisational culture should be used, supplemented with three elements that together constitute a systemic approach, referred to as the "triangle of silence", with those that:
- have ideas and pay attention to critical issues, but remain silent
- do not encourage, but hinder or silence the ideas or concerns of others, censorship
- can change but neglect the voices that raise ideas and critical issues, deafness

The second is the Swedish example of measuring silence, which highlights the occurrence of silence, the culture of silence among employees, and its relationship with work and organisational culture. The organisational culture model supplemented with the triangle of silence is consistent.
The analyses are based on a survey and registered data from a representative sample of Swedish working-life employees (n=25,000) (answering frequency=30%).
Differences depend on the industry, organisational size, employee function structure, labour market conditions, and organisational culture.

The third is a comparison study between Sweden and 18 European countries. Critical situations in work, silence and motives for silence, grouped by conditions−Lisbon EU Strategy (Visser, 2009) and broken down by the industry, employee function-structure, for example, are highlighted. Comparative country studies can contribute to the macro-cultural conditions' contribution to silence at work.

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Bio sketch

Antonis is the Planning Manager of ELINYAE. He is a Mechanical Engineer with a master's degree in Business Administration and a PhD in Occupational Health and Safety Economics. He is also an adjunct faculty in the Open University of Cyprus, teaching Risk Management.

"An on-line OSH data exchange system for compliance"

Systems for OSH compliance usually consist of two subsystems: the inspection authorities and the enterprise. They both separately interpret legislation, guidelines and know-how, into case-specific measures, as the only interaction between them is through rare and partial on-site inspections. Inevitably, these interpretations differ and information of authorities about the real safety conditions in workplaces is scarce, partial and non-timely.

A standardized, direct channel to exchange OSH data between them, is proposed. Legislation will be centrally interpreted into a single, on-line list of specific measures, and enterprises will self-declare compliance. Thus, clear information will be provided to the enterprises about specific requirements, and authorities will have a global, holistic, real time picture of compliance. Different interpretations will be reduced, and on-site inspections can be standardized and prioritized.

This list is based on the model of ESAW, where all material factors and modes of accidents are included. For every material factor, possible modes of accidents and relevant preventive measures are identified, along with the relation between them. Declaration of each material factor and compliance to the prescribed relevant prevention measures, automatically produces a standardized risk assessment, also indicating the missing relevant measures.

This information is centrally processed by the system, creating specific alerts to enterprises and authorities and also prioritizing and guiding on-site inspections on the basis of verification of already declared measures.

Such a universal, standardized and transparent risk assessment, based on leading (safety), rather than lagging indicators (accidents), could also apply in insurance premium adjustment. ESAW codification, along with artificial intelligence and Internet of Things applications can improve and simplify the system. A relevant pilot electronic application has already been developed.

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Bruna Maria Rondinone holds a degree in Statistical and Economic Sciences from the University of Bari (2001) and a postgraduate specialization (MPhil) in Health Statistics from "Sapienza" University of Rome (2009). She is currently a Senior Researcher at the Department of Occupational and Environmental Medicine, Epidemiology, and Hygiene (DiMEILA) of INAIL.
She has contributed as a systematic reviewer to the WHO Guidelines on nanomaterials and the WHO/ILO Joint Estimates on the burden of occupational disease.
Her main research interests include research priority setting, occupational epidemiology, data analysis, work-related stress, carcinogenesis, burden of disease, systematic reviews, and meta-analysis. She has wide experience in designing national surveys on workplace risk perception, particularly among OSH professionals, and online survey tools.
Co-author of over 100 national and international scientific publications and conference abstracts in the OSH field. She is highly proficient in statistical software.

"The Futures 2 project: a comparative analysis of PEROSH researchers' priorities and national OSH strategies to assess the impact of health, social and economic changes on future research."

Following on the "Futures" project (2016-2017) and considering the relevant changes occurring in the world of work due to health, social and economic changes, INAIL has launched the Futures 2 project, to explore if and how these changes have modified the PEROSH researcher's perceptions of research priorities. The project also includes a comparative analysis of the OSH national strategies to understand differences in the priorities among countries and to assess the level of consistency of the PEROSH researchers' point of view with the national context. A sample of 156 researchers across the 15 PEROSH Institutes was invited to answer the first round of a Delphi questionnaire asking to rate on a 0-5 Likert scale the inventory of OSH research priorities from the first Futures project, and to list a maximum of 3 new well-focused research topics on which they think there is a need of further research. 102 questionnaires were returned, with a response rate of 65.4%. The main elements of the OSH national strategies were requested to the PEROSH Scientific Steering Group members. A total of 9 reports summarising the national strategy and providing links to relevant documents were collected.

The preliminary analysis of the first round of the Delphi questionnaire revealed changes in the ranking of some research priorities compared to the results of the first Futures project but also confirmed the importance of topics related to technological innovation and smart solutions. Among the new research priorities artificial intelligence and climate change are playing the major role, but also more traditional topics like vulnerable workers and chemical risk factors were frequently proposed as hot topics for future OSH research. Results of the second round of Delphi consultation as well as those from the comparative analysis of the national strategies will be used to map overlaps and gaps among research priorities identified and for broader stakeholders' consultation.

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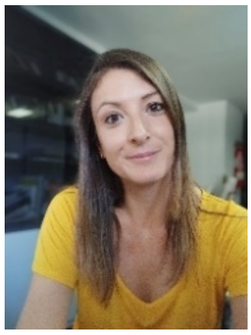

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Bio sketch

My name is Carina Liarte, and I am a Senior Prevention Technician at the National Institute for Occupational Safety and Health in Spain.
I am currently working in the Department of Health Promotion and Occupational Epidemiology. I participate in several working groups related to mental health and occupational disease, as well as the gender working group in collaboration with the regional communities.

"Sentinel Network of Oncology Specialists for Detecting the Occupational Origin of Paranasal Sinus Cancer Cases"

Occupational cancer is one of the leading causes of work-related mortality in the European Union. In Spain, the current systems for recording occupational diseases appear to show underreporting of occupational tumors, including paranasal sinus cancers, thus limiting accurate knowledge of their incidence.

This project consists of the creation of a sentinel network of oncology specialists to improve the epidemiological surveillance of these tumors. The establishment of this network involves the development of a registration system through an anonymous digital platform, managed by oncologists, which collects clinical data and occupational exposure information from patients diagnosed with paranasal sinus cancer.

The collected data will allow the identification of common occupational exposures, estimation of the disease burden attributable to work, and generation of solid scientific evidence for future studies. The project, funded by the INSST (National Institute for Safety and Health at Work), is currently being developed in autonomous communities with high-risk industries, in collaboration with the SEOM (Spanish Society of Medical Oncology).

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PROTECTING PEOPLE AND PLACES

Bio sketch

Chris is a principal occupational hygienist within HSE's Science Division. She has more than 30 years' experience in assessing occupational exposures and control approaches across a wide range of industry sectors. Chris is a chartered fellow of the Faculty of Occupational Hygiene and was president of the British Occupational Hygiene Society in 2022/23.

"Control of risk from stone dust containing high levels of crystalline silica"

There have been a significant number of cases globally of accelerated silicosis linked to the processing of high crystalline silica content (HCS) resin based engineered stones. It is widely known that dry processing of these materials can cause respirable crystalline silica (RCS) exposures significantly in excess of occupational exposure limits. However, less was understood about the exposures arising from wet processing methods.

This presentation will discuss a series of site visits to GB worktop manufacturers processing HCS materials using mainly wet methods. An extensive measurement protocol was deployed to better understand the extent of respiratory risk in this environment. A detailed assessment of exposure control options associated with wet processing has generated a clearer understanding of how to adequately control health risks when working with these materials.

Measured RCS exposures at the sites visited were generally below the GB workplace exposure limit (WEL) for RCS. Exceedances of the WEL could be linked to dry cutting/grinding or situations where control using water suppression could be improved using methods already set out in HSE guidance. This work underlined the need for control of the mist generated from wet processing, and this presentation will discuss how the hierarchy of control should be applied in the worktop manufacturing sector to achieve this.

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Bio sketch

Ms. Samel is a research assistant at the Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA). She works in the section of epidemiology. Before joining the IFA she worked for the University Hospital of Cologne and the German Aerospace Center in the field of medical statistics.

"PEROSH-International Comparison of Sampling Strategies - Hazardous Substances (PEROSH-ICSS-HS) – an explorative feasibility study and first results with airborne wood dust"

Introduction:
The objective of this project is to quantify measurement deviations caused by differing sampling systems and strategies across EU member states, based on parallel measurements. Such methodological differences can lead to significant discrepancies in exposure assessments, even under identical conditions. The long-term goal is to ensure comparability of exposure measurements throughout the EU.

Methods:
Parallel measurements were conducted to quantify differences between sampling systems used in various countries to assess wood dust concentrations (inhalable fraction). All systems operated simultaneously under identical exposure conditions. Between 2021 and 2024, 48 such measurements were carried out in typical wood-processing facilities in Germany. To evaluate the relationship between systems, scatter plots with linear regression were generated using the German standard sampler (GSP10) as reference. Agreement and potential non-constant biases were assessed via Bland-Altman plots. Unusual residual patterns in several comparisons suggested systematic deviations depending on exposure level, prompting additional linear trend fitting within the Bland-Altman plots to explore these effects.

Results:
Linear regression showed a moderate to good fit between devices. Bland-Altman plots indicated a non-constant bias in some comparisons, with differences varying by exposure level—though no clear pattern could be confirmed.

Conclusion:
Some devices showed a significant slope in the linear fits of the Bland-Altman plots, indicating a non-constant bias relative to the GSP10. This suggests that simple conversion factors or linear approximations are insufficient to describe the relationship between samplers. Further analysis is needed to better understand and quantify their comparability.

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Bio sketch

Christine Darbakk is a PhD Research Fellow at the National Institute of Occupational Health in Norway, currently in her final year. Her PhD study focuses on the occupational exposure and inflammatory potential of bioaerosols in the food industry. She is now awaiting the assessment of her dissertation and the opportunity to defend her doctoral degree.

"Occupational exposure and inflammatory potential of bioaerosols in the food industry"

Workers in the food industry are frequently exposed to airborne particles from powdered materials, posing potential risks of respiratory sensitization and inflammation. These bioaerosols may contain harmful components such as endotoxins, allergenic proteins, mycotoxins, and fungi. In this study, personal bioaerosol sampling was conducted at 12 production facilities handling powdered food materials to assess worker exposure. To evaluate the inflammatory potential of these exposures, an in vitro model using macrophage-like THP-1 cells was employed. Inflammatory responses were quantified using a Luminex assay to measure cytokine concentrations. Inhalable bioaerosol concentrations ranged from 0.1 to 11 mg/m³. A clear dose–response relationship was observed between the mass of collected bioaerosol and the magnitude of cytokine responses. However, when responses were normalized to bioaerosol mass, significant differences in intrinsic inflammatory potential between different production sites depending on product remained evident. This indicates that both the concentration and specific composition of bioaerosols contributed to the inflammatory response. These findings underscore the need for exposure assessments and health risk evaluations across different food production environments.

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Bio sketch

Claudine Strehl is managing the Section Radiation at the Institute for Occupational Safety and Health of the German Social Accident Insurance located at Sankt Augustin in Germany. The section focuses on artificial and natural optical radiation in the workplace. One of her main topics is UV induced skin cancer and its prevention especially in outdoor workers.

"How to reduce the constantly rising climate risk due to solar UV exposure in occupational settings at high risk"

Changing levels of UV intensity, driven by various climate change effects such as the thinning of the ozone layer, increased sunshine duration, and fluctuating cloud cover, are expected to significantly elevate the risk of skin cancer diagnoses. This issue predominantly impacts outdoor workers, but it also extends to leisure activities, highlighting the urgent need for effective prevention strategies. These strategies must be tailored to meet the specific requirements of different outdoor occupations.

The foundation of these efforts lies in raising awareness about the potential hazards of solar UV radiation. It is crucial for individuals to understand that UV exposure can pose serious health risks, making prevention a priority. Once this awareness is established, we can move forward in developing targeted prevention strategies that address the unique challenges faced by outdoor workers. Involving employees in this process is essential. Their specific needs, preferences, and concerns should be taken into account when designing prevention concepts according to the TOP principle, e.g. with focus on personal protective measures, such as appropriate clothing or sunscreen.

To illustrate the effectiveness of these strategies, we will provide examples of how specific recommendations can enhance this process. These examples will offer insights into the potential for further development of training methods and protective measures against solar UV radiation. By implementing comprehensive prevention strategies and fostering a culture of awareness, we can significantly reduce the risk of skin cancer among outdoor workers and promote safer leisure activities for everyone. Ultimately, a proactive approach to UV protection is vital in safeguarding public health in the face of changing environmental conditions.

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PROTECTING PEOPLE AND PLACES HSE

Bio sketch

Dr. Chambers is an accomplished risk assessment scientist with over 25 years of experience at the UK Health and Safety Executive (HSE). He has published 20 technical papers and numerous HSE research reports, contributing significantly to the development of innovative risk assessment methodologies and regulatory approaches for new and emerging technologies. He has led multiple research projects and plays a key role in mentoring new researchers and delivering training to HSE inspectors, industry professionals, and the public.

Colin is an active member of both the HSE Robotics and Autonomous Systems group and the AI Common Interest Group. He has collaborated with the UK RAS community and the UK Regulators Network. Within HSE and with external partners, he works extensively to support the safe and effective integration of advanced technologies into UK industry. He is dedicated to building capability and knowledge across the risk assessment community, with a strong focus on the regulatory aspects of adopting new and emerging technologies.

"Risk Assessment Approach for Industrial AI Systems Based on Established Industry Methods – First Steps"

This preliminary study proposes a risk assessment approach for artificial intelligence (AI) systems within UK industrial settings, based on adaptations of established industry risk assessment methodologies. The approach addresses the complete risk assessment cycle: hazard identification, risk evaluation, and assessment of proposed layers of protection, creating a comprehensive risk assessment approach for AI-driven industrial autonomous systems.

The approach demonstrates how conventional tools such as Hazard and Operability Studies (HAZOP), Failure Modes, Effects and Criticality Analysis (FMECA), Fault Tree Analysis (FTA), and Layers of Protection Analysis (LOPA), can be adapted to perform an AI driven systems risk assessment.

HAZOP adaptations introduce AI specific guide words addressing hazards including misinterpretation, overconfidence, drift, and generalisation failure, whilst evaluating training data quality and biases. FMECA identifies AI-specific failure modes such as algorithm convergence failures, adversarial attacks, and contextual misinterpretation. FTA enhancements could include algorithmic failure branches and probabilistic modelling for inherent uncertainty, whilst adapted LOPA prompts assessment of AI-specific protection layers and safeguard independence.

The approach advocates a multidisciplinary approach combining process safety, AI, domain expertise, human factors, and regulatory expertise, emphasising comprehensive documentation and system modelling. Practical implementation is demonstrated through a simple industrial case study.

The preliminary study concludes that adaptations of traditional risk assessment techniques, coupled with ongoing evaluation, has the potential to provide a suitable risk assessment approach that will contribute to the safe implementation of AI based systems in UK industry.

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Bio sketch

Dzmitry Misiulia is a research associate at the Institute of Particle Process Engineering at the University of Kaiserslautern-Landau (RPTU). His research focuses on aerosol technology, multiphase flows, and Computational Fluid Dynamics. The current research project in cooperation with the Institute for Occupational Safety and Health of the German Social Accident Insurance (IFA/DGUV) focuses on with the development of a high-flow personal sampler for the respirable dust fraction.

"Design and investigation of a high flow respirable sampler"

Sampling to determine dust exposure in the workplace is always conducted actively, employing samplers. For the respirable dust fraction, the most common are cyclone samplers, and nowadays there is a variety of personal cyclone samplers, which operate at flow rates from 1 l/min up to 10 l/min. The main objective of this work is to develop a cyclone sampler operating at a flow rate of 20 l/min that meets the sampling efficiency curve, determined by the respirable convention EN481. This is realized using experimental measurements and Computational Fluid Dynamics (CFD).

Three different cyclone designs, the Higgins-Dewell (HD) design, the Gussman-Kenny (GK) design, and a uniflow cyclone (UC) design, were computationally investigated. For aerosol flow modelling, the Euler-Lagrange method was applied, where the continuous air phase is treated with Large Eddy Simulations (LES), whereas the dispersed phase is treated in a Lagrangian approach. Numerical simulations have been validated based on experimental data on penetration.

The cyclone GK6.27, which showed the lowest deviation in the sampling efficiency curve compared to the respirable convention, was manufactured and experimentally tested.

This work was performed in collaboration with the Institute for Occupational Safety and Health (IFA) of the German Social Accident Insurance (DGUV) under project FP-0484.

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Edvige Sorrentino graduated in Law at Sapienza University of Rome and completed a postgraduate Master's in European Law at University of Roma Tre. She is currently a researcher at the Department of Occupational and Environmental Medicine, Epidemiology and Hygiene (DiMEILA) of INAIL, where she conducts research focusing on the impact of digitalization processes and the integration of artificial intelligence systems in occupational settings, with particular attention to the legal implications these technological innovations entail for the regulatory framework governing occupational health and safety.

"Digital transformation: organisational resilience for managing new emerging OSH risks"

The productive environments of Industry 4.0 show a high level of systemic complexity, mainly linked to the increasing human-machine interaction. In such contexts, new paradigms and safety assessment methods are necessary to account for the growing complexity of work environments. To address this change and ensure an anthropocentric, safe, and sustainable digital transformation, it is essential to evaluate new risks arising from the introduction of specific technological solutions in production contexts, starting from the early stages of technology design and implementation, by clearly, jointly, and consciously defining roles, spaces, tasks, and responsibilities.

The new challenges brought by technology in the field of occupational health and safety deal with issues such as the inadequacy and related risk of replacing workers lack ok the necessary skills, the algorithms black box, increasing automation, and risks associated with the use of AI. Managing these new risks requires adopting preventive strategies ranging from updating regulations to continuous training of the workers involved (lifelong learning) so that we can cope with change, and finally implementing methodologies to monitor risks over time.

Inside the scientific research activity funded by INAIL, new and emerging risks for occupational health and safety linked to digital transformation have been analyzed, and the Resilience Analysis Grid (RAG) methodology, based on resilience engineering principles, has been tested to assess the potential resilience state of organizations regarding the implementation of new technologies and their impact on business processes and organizational models. In addition, self-assessment tools have been developed concerning risk management methods and training strategies related to the implementation of specific technological solutions.

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Bio sketch

I am a researcher in the field of safety and health. My academic background is in political science, and my ongoing PhD thesis focuses on chemical alternatives assessment with multicriteria decision analysis, a sub-field in decision science. My aim is to develop decision support tools that enhance the development of chemical products that are as safe and healthy as possible for both humans and the environment.

"MCDA-assisted chemical alternatives assessment based on input data generated using the SSbD toolbox"

The extensive use of chemicals in modern society demands a stronger focus on safety and sustainability, especially as the rapid increase in chemical production challenges traditional risk assessment methods. The EU is responding through initiatives like the European Green Deal and the Chemicals Strategy for Sustainability (CSS), which promote the design of safe and sustainable chemicals. A key approach is the "Safe and Sustainable by Design" (SSbD) framework, introduced in 2022, which integrates safety and sustainability considerations early in innovation. Supported by JRC technical reports, the SSbD framework outlines a five-step chemical alternatives assessment (CAA) process that evaluates hazards, occupational safety, consumer health, environmental sustainability, and socio-economic impacts.

To support this, the SSbD toolbox—developed within the PARC partnership (Partnership for the Assessment of Risks from Chemicals)—offers tools and methods for chemical risk assessment aligned with different innovation stages, from early development to production. The earlier a problematic chemical is identified, the better for the development process. Selecting the most appropriate chemical alternative requires CAA, which can be enhanced through multi-criteria decision analysis (MCDA). In MCDA-assisted CAA, alternatives can be evaluated using input data from the toolbox, enabling the identification of the most suitable alternative for a specific application. MCDA provides a systematic approach for evaluating complex decisions that involve conflicting criteria, diverse data types, uncertainty, and decision-maker preferences. When integrated into the SSbD toolbox, MCDA offers robust decision support for chemical product developers in their pursuit of safer and more sustainable solutions.

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Bio sketch

I work with research and surveillance of the working environment and occupational health at STAMI in Norway. My educational background research is nutrition with research background primarily in epidemiology. Main research topic today is mental health and young workers.

"Downsizing and mental distress"

Background: Downsizing refers to a situation where a company or organisation take action to reduce personnel. The company can use many different methods or strategies to achieve this immediately or over time. A decision to downsize is often intertwined with a decision to restructure the company. Employees that remain in a company throughout downsizing, the survivors, are subjected to a process that may increase job insecurity and cause changes to the working environment and job tasks. Many studies find an association between downsizing and reduced well-being among survivors. We aimed to assess whether aspects related to involvement, information and support during downsizing modifies this association.

Method: We used panel data from three iterations (2013, 2016 and 2019) of a nationwide survey in Norway (the Survey of Living-Working conditions) to identify individuals who were employed by the same company between two surveys. Logistic regression was used to compare the odds ratio (OR) of developing mental distress (defined using the five-question version of the Hopkins symptoms checklist) from the baseline and to the follow-up survey.

Results: Among 3871 employees, 784 reported at the follow-up survey that their company had performed downsizing in their own department within the last three years. These employees received questions pertaining to the degree of involvement, information and support that they had experienced during downsizing. Compared with employees not exposed to downsizing, OR (95% CI) for mental distress was 1.27 (0.82−1.91) among employees that rated involvement, information, and support during downsizing as sufficient (n = 580) and 5.02 (3.03−8.04) among employees that rated it as insufficient (n = 149).

Conclusion: Downsizing is a frequent and unavoidable exposure. We find that it reduces the well-being of surviving employees, but also that this association is mitigated by a more involving, informative and supportive downsizing process.

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Emma Pietrafesa graduated in Foreign Languages with a specialization in Information and Communication (2003), and in Political Science (2004), both at LUMSA University in Rome. She holds a PhD in International Relations at Sapienza University of Rome (2008). She is currently a Senior Researcher at the Department of Occupational and Environmental Medicine, Epidemiology and Hygiene (Dimeila) at INAIL. An expert in communication, digital technologies, and innovative teaching methodologies, she serves as the scientific coordinator for national research projects in the field of occupational safety and health (OSH) and communication. She is also a trainer and lecturer in university courses and professional training programs for OSH professionals, in accordance with the Italian Legislative Decree 81/08 and subsequent amendments. She has been a speaker at more than 50 national and international conferences and seminars in the field of occupational health and safety, and is the author of over 50 publications, including peer-reviewed journal articles, book chapters, monographs, and conference abstracts.

"Innovative tools in OSH info-training: Inail-Dimeila case studies on road safety and climate change"

Information, education, and training play a key role in improving occupational safety and health (OSH) conditions, as established by EU legislation and by Italian Legislative Decree 81/08, as amended and supplemented. In recent years, digital technologies—such as augmented reality (AR) and virtual reality (VR)—have emerged as innovative tools for fostering psychological development, well-being, and vocational training. Applying these technologies to OSH training can enhance participation, interpersonal engagement, and motivation by integrating educational and informational elements, promoting more thoughtful decision-making, and encouraging the adoption of safer and healthier behaviours. To achieve effective training that generates positive changes in workers' attitudes, it is essential to adopt new learning methodologies that leverage AR/VR—particularly through gamification techniques. This work adopts an experimental, multidisciplinary, and multi-sectoral approach to present case studies of innovative info-training initiatives developed by INAIL–Dimeila using digital technologies, particularly AR/VR and digital serious games. These include: a) Driving Safe virtual reality lab; b) Augmented reality poster on data visualization and risk scenarios; c) Obstructive Sleep Apnoea virtual reality lab; d) SLEEP-RO@D, a digital serious game on sleep hygiene; e) Heat Stress, a game-based learning experience on climate change and high-temperature exposure risks in the construction sector. According to recent research, our findings support the notion that digital gamification can be an effective strategy to increase engagement, interpersonal connection, and motivation in OSH training. It provides an ideal balance between education and entertainment, fostering deliberate decision-making and building awareness of risks and unsafe behaviours in a controlled, secure environment. When workers actively learn how to respond appropriately to risks, they develop new "mental habits," along with social and emotional skills, and cultivate a positive, safety-oriented mindset.

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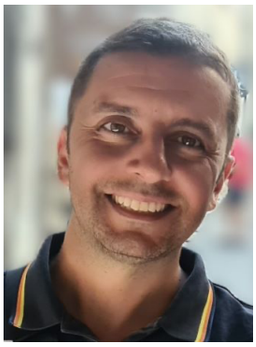

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"Potential exposure to airborne nanomaterials generated from 3-D printing processes"

In recent years, the development of 3-D printing techniques has been increasing worldwide due to the opportunities for quick and customized manufacturing and low production costs. In this context, the use of nanomaterials (NMs) and advanced materials (AdMa) may improve the final product features and allow the creation of objects with new and enhanced properties for applications in different sectors (e.g., aerospace, automotive, electronics, and medicine). In parallel it is crucial to assess early the potential risks for human health related to potential exposure to NMs and other pollutants generated in work environments. For this purpose, commercial polyamide (PA12), thermoplastic polymer (ABS), and UV-curable photo-resin (PR) used in different 3-D printing processes have been tested by applying the OECD-CEN harmonized tiered approach. Information gathering on materials and processes, emission tests of trial powders in controlled laboratory settings, and workplace measurements and sampling are conducted to characterize the relevant metrics for inhalation of airborne particles in different exposure scenarios. The study is part of a collaboration project between INAIL and STAMI (Norway) aimed at evaluating the exposure to airborne NMs and AdMa in the work environment. The results confirmed that commercial PA12 airborne powders are mainly distributed in the micrometric size range. ABS is recognized as a hazardous material due to its potential human carcinogenic properties, and significant emissions of NMs occurred during the printing process, with relevant values also in the worker's near-field. Although PR is classified as toxic by inhalation, no relevant emissions have been found when it is used in a two-photon absorption lithography process, also due to the effectiveness of the internal ventilation system. Preliminary recommendations for workplace exposure mitigation depend on process type and may include general containment measures for 3-D printers with local exhaust ventilation.

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Her research focuses on the statistical and epidemiological aspects of OSH, with particular attention to risk factors affecting working conditions. She has extensive experience in national surveys on workplace risk perception, particularly targeting OSH professionals. She is also actively involved in research promoting worker participation in prevention activities, especially in the context of digital transformation. Currently, she is a Research Partner in the project ALMA-AI: Exploring OSH Impact of Algorithmic Management & AI, within the PEROSH network. Co-author of more than 100 national and international scientific publications and conference abstracts in the OSH field.

"Workers' Participation, Representation and Prevention in the Digital Era: Evidence from National Case Studies"

Digitalization has notably transformed the world of work in recent decades, reshaping organizational structures and promoting gig economy models based on short-term and low-protection contracts. Almost 28 million people in the EU are engaged in work through digital platforms, a figure expected to rise to 43 million by the end of 2025. According to the 2024 Italy Fairwork Report, about 2.2 million Italians earned income through digital platforms, with around 600,000 through platform-based work, reflecting a diverse workforce with varying needs based on income reliance.

In this context, INAIL funded and took part in the PrePaRa project (Prevention, Participation, and Workers Representation in the Age of Digital Transformation), coordinated by Politecnico di Milano with the involvement of other national Institutes and Trade Unions representatives. The study investigates the impacts of digitalization on work organization, occupational health and safety, and worker representation systems, exploring how it is reshaping working environments across sectors, with a focus on platform economies and Industry 4.0. The research adopted a mixed-method approach: interviews with key experts, workshops and company case studies, selected to represent the transformations under investigation, ensuring a balanced distribution (e.g. logistics, transports, telecommunications, creative industries). A comparative analysis was conducted to examine differences across various dimensions.

Findings revealed significant variability in digital transformation impacts-from greater autonomy to increased algorithmic control and work intensification. Gig work raises concerns on representation and social protection. While digitalization can enhance efficiency and safety, it also introduces new risks and challenges on prevention systems, highlighting the key role of Health and Safety Representatives. The study calls for inclusive prevention, training, and legal reforms to support safe digital workplace.

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"Hydrogen Carrier Gas in GC-MS: A Sustainable Alternative to Helium for measuring PAHs in the Workplace"

Helium is used as an instrumental carrier gas for chemical measurements undertaken using gas chromatography–mass spectrometry (GC-MS) but increasing demand for a naturally-occurring resource that is finite is forcing laboratories to now evaluate the potential in using hydrogen as a more sustainable alternative but with the proviso that technical and safety issues are considered.

This study evaluated use of hydrogen as an alternative to helium for the analysis of polycyclic aromatic hydrocarbons (PAHs), a class of potentially harmful chemicals, in occupational safety monitoring programs. Here a hydrogen-based GC-MS method for the measurement of 16 priority PAHs was optimized and validated and its performance in terms of resolution, sensitivity, analysis time, and method robustness compared with that obtained using a traditional helium-based method. Results demonstrated that by using hydrogen as a carrier gas, a more sensitive assay with improved chromatographic resolution and with reduced sample run times is possible.

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Dr Helen Balmforth is the head of Data Analytics at the Health and Safety Executive and leads the team providing Data and Spatial Analysis expertise across HSE and wider to support the UK Government and private sector. Helen has over twenty years' experience of developing and delivering analytical solutions and applications for a range of health and safety issues. This includes risk assessment methodology development, demographic analysis, including the development of the National Population Database (NPD) and also the development of Regulatory Intelligence models to help target and prioritise interventions. Helen is the Programme Director for Discovering Safety, a large programme, which aims to improve health and safety performance on a global scale using data and analytical techniques to provide new insight and solutions. Helen also leads HSE's recent sandbox initiatives including the Industrial Safetytech Regulatory Sandbox and the subsequent Smarter Regulation Sandbox. She also attends the cross Government Chief Data Officers Council.

"Smarter Regulatory Sandbox - exploring opportunities to improve health and safety using AI and technology"

By harnessing the potential of smarter, 'machine readable' regulations and data there is an opportunity to improve workplace safety, accelerate compliance and consider any other regulatory issues prior to deployment.. This project presents the Health and Safety Executive Smarter Regulatory Sandbox (SRS), exploring how AI digital technology can make regulatory information more accessible to organisations to improve health and safety performance and risk management, whilst supporting innovators bringing digital products to market. The SRS created a collaborative space for the regulator, construction companies and tech providers to explore how access to smarter regulations can unlock new products and services, for industry to improve health and safety. The SRS provided tech companies access to trial HSE digital assets in commercial contexts, within their products. Enabling them to explore how technology such as AI, analytics or machine learning can leverage the datasets in novel and impactful ways.

The SRS ran for three months and explored five industry challenges;

- Creating a machine-readable knowledge base enabling contractors to understand near real-time compliance with external and internal requirements
- Testing Large Language Models (LLMs) to detect unsafe working practices captured in CCTV site footage, based on health and safety text and image content
- Testing bespoke LLMs to serve up knowledge content via WhatsApp in different user contexts
- Evaluating an app identifying fatigue-related issues and its use for assessing workforce physical readiness-to-work.
- Exploring if machine learning models can benchmark health and safety performance against published good practice standards

Some of the SRS results included;

- LLM accuracy improvement of 30% through direct regulatory content access
- Detection of acute workplace fatigue and user feedback to improve app functionality
- Combining CCTV images used to monitor construction progress with other data to anticipate risks.

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James Forder is part of the Analytical Chemistry Team at HSE's Science and Research Centre. He has 20 years' experience of a wide range of occupational hygiene and forensic investigation analysis including metals, particulates, acids and small molecules. James is also experienced in the development and production of proficiency testing samples as part of the AIR PT scheme. The analysis of diisocyanates in air is currently a particular focus of his and he is a member of the ISO Working Group ISO/TC 146/SC 2/WG 4 'Organic Compounds'.

"Improvements in the determination of diisocyanates using a new gradient elution HPLC methodology"

Exposure to airborne diisocyanates remains a leading cause of occupational asthma and sensitization. Occupational exposure limits, based upon measuring the total reactive isocyanate groups (TRIG) within such agents, are enforced in the United Kingdom and elsewhere. The measurement of TRIG has advantages over the measurement of individual monomer and oligomer isocyanate species because the exposure metric is explicit, thus facilitating easier comparability of exposure data sets. The European Chemical Agency's Risk Assessment Committee supports this approach because in their view diisocyanates share a common mechanism of inducing hypersensitivity reactions and also because there is insufficient data to assess differences in potency for different diisocyanates.

In the UK, HSE MDHS25/4 is the recommended analytical method for determining TRIG as it is the only method capable of measuring oligomeric diisocyanate compounds where calibrants are not available. This procedure employs high-performance liquid chromatography with concurrent use of ultraviolet spectrophotometric and electrochemical (EC) detectors to facilitate the identification of oligomer species and to enable quantification using a readily available monomeric calibrant.
Historically, using gradient elution resulted in instabilities in EC detector responses. However, with improved instrumentation, a new gradient elution method now offers improvements to; peak shape (especially for later eluting oligomers); response ratios; resolution of monomers from the 1,2-MP reagent peak and better sensitivity, over the original isocratic method.

The presentation will describe the analytical validation work undertaken that included the analysis of bulk diisocyanate formulations and air samples derived from workplaces.

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Joanna Kamińska, Ph.D. (Eng.) is a researcher at the Department of Ergonomics at the Central Institute for Labour Protection – National Research Institute (CIOP-PIB) in Poland. Her scientific work focuses on the assessment of musculoskeletal load in occupational settings, the ergonomic design of computer workstations, and the health implications of hybrid and remote work. She is also engaged in developing practical guidelines for adapting work environments to meet the needs of people with disabilities and older employees.

"Ergonomic Challenges of Working with Display Screen Equipment"

Display screen equipment (DSE) is used in various workplaces—from offices to retail and logistics. Its widespread application, including in private life, creates ergonomic challenges for employers and users. A 2023 study by CIOP-PIB (n=500+) showed that only 15% of respondents worked in a standing position for more than 100 minutes per day, while 11.5% worked seated on a sofa or bed, an ergonomically poor choice. EMG-based lab tests revealed that self-set workstations led to greater wrist extensor activation than expert-adjusted ones. Standing at self-arranged desks resulted in asymmetrical posture—higher right trapezius and lower right erector spinae activity. These results show a gap between ergonomic knowledge and practice. For example, touchpad use caused greater forearm muscle load than vertical or traditional mice.

Another issue is sedentary behavior. Prolonged sitting contributes to musculoskeletal disorders, obesity, cardiovascular disease, type 2 diabetes, cancer, and higher mortality. It is also associated with greater mental strain and depression. People taking over 7,500 steps daily showed 50% lower depression rates than those taking under 5,000 (Azar et al., 2008). To address these risks, both ergonomic education and practical skills—such as organizing work, using proper equipment, and increasing standing time—are vital. Promoting physical activity and reducing sedentary time is essential for long-term health and well-being.

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Johan Stenmark is working as an analyst and project manager at the Swedish agency for work environment expertise. He has been working for the agency for the last five and a half years and before that he worked at the Swedish energy agency. He has also a background in operational development for municipalities and did some work as a resilience consultant. His educational background has an interdisciplinary focus with a bachelor in sociotechnical systems and a Master´s in sustainable development.

"The Impact of Remote Work on Gender Equality in the Labour Market: Quantitative Findings from Sweden and a Systematic Review of International Research"

The first study is a systematic literature review comprising 68 peer-reviewed articles published between 2020 and 2024. Following a structured methodology adapted from the PRISMA framework and guidelines, the review analyses how remote work affects career development, income inequality, productivity, and work-life balance from a gender perspective. The findings show that while remote work can facilitate greater labour market participation for women with caregiving responsibilities, it may also reinforce traditional gender roles. Reduced workplace visibility and persistent gendered norms continue to limit women's career advancement and wage progression.

The second study is a quantitative analysis drawing on cross-sectional and longitudinal data from Statistics Sweden's Labour Force Surveys (2016–2024), which cover the Swedish working-age population. Ordinary Least Squares (OLS) regressions and fixed effects panel models were employed to examine the association between telework and actual weekly working hours, stratified by gender and parental status. The results reveal that remote workers report longer working hours than non-remote workers, particularly among women and mothers. However, longitudinal analyses suggest that selection effects largely explain the observed associations, indicating a limited causal relationship between remote work and changes in working time.

In conclusion, while remote work presents opportunities for promoting gender equality, its transformative potential appears constrained by structural and normative barriers. Further longitudinal research is required to assess the long-term implications of remote work on labour market outcomes, including career progression, wage development, and work-related health.

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Keld Alstrup Jensen is employed as professor in the chemical working environment at the National Research Centre for the Working Environment (Denmark). His research covers from (nano-)materials characterization, testing, exposure assessment, method development, and innovation risk governance connected to safety-and-sustainability-by-design. He is active in both national and international research collaboration and standardization in CEN and OECD and assistant editor at Annals of Work Exposures and Health.

"AI-supported electron microscopy analysis of occupational asbestos exposure concentrations: Needs and state of play"

The EU directive EU Directive 2023/2668 has put forward two options for a new occupational exposure limit for airborne asbestos in Europe. Either the limit is reduced to OEL1: 0.002 fibers/cm3 counting fibers with aspect ratios >3 and sizes 0,2µm<thick<3µm and >5µm long or OEL2: 0.01 fibers/cm3 including counts of fibers thinner than 0,2µm (no lower limit defined). Measurements shall be made by electron microscopy to ensure proper size measurement and identification of asbestos fibers by chemical composition. In most European countries, the change in analytical requirements forces a shift from optical Phase Contrast Microscopy (PCM), which has been widely used despite its limitations (ISO 14966: 2019). A PEROSH working group showed that it was not possible to establish general factors to convert data obtained by PCM to data obtained by Scanning Electron Microscopy (SEM) or Transmission Electron Microscopy (TEM) (Franken et al., doi:10.1093/annweh/wxaf023). It was concluded that there is a need for better harmonization of protocols and measurement requirements across Europe for better comparability between data. The PEROSH network recommended to establish electron microscopy approaches for asbestos analysis supported by Artificial Intelligence (AI) to make the future analysis cost-effective and more comparable. Calculations show that the analytical demand easily becomes very high when a sample has asbestos concentrations around and below the proposed OEL's. For OEL2 this may come as a surprise, but including fibers thinner than 200 nm requires analysis at higher resolution and hence a need to analyze more images to cover the same area. Currently, AI-supported asbestos fiber quantification methods are under development for SEM. Similarly, a roadmap for establishment of the AI-approach and its standardization is under establishment within the PEROSH asbestos network. In the talk, we present the problem, challenges, and state of play.

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Liên Wioland, who has held a PhD in cognitive ergonomics since 1997, has been a research manager in the Applied Sciences for Work and Organizations department at INRS for around twenty years. She is currently leading research on the adoption and integration of new technologies, with a focus on occupational risk prevention and improving working conditions.

"Adopting occupational exoskeletons: from initial interaction to long-term use"

Musculoskeletal disorders (MSDs) have been by far the most common occupational diseases in Europe. When all solutions to improve working conditions have been exhausted or automation is not possible, occupational exoskeletons, can be considered as device to improve working conditions. Despite a broad consensus demonstrating the effectiveness of exoskeletons in locally reducing muscular strain and perceived effort, this does not necessarily lead to their regular adoption by operators. The adoption will be examined through the lens of occupational risk prevention, focusing on the quality of Human-Exoskeleton Interaction (HEI). The quality of HEI can lead to tension or agreement points depending on its appropriateness. Poor interaction quality may generate psychosocial risk factors, MSDs, or even accidents.

The aim of this study is to formalize the psychological and psychosocial mechanisms underlying the adoption. Four studies involving 20 companies was conducted, employing multiple methods. Adopting an exoskeleton is a process composed of a pre-adoption, familiarization and a routinization stage. During these 3 stages, the HEI is assessed by users based on several interrelated determinants (ease of use, utility …). The quality of HEI is also influenced by changes in activity resulting from the use of the exoskeleton. During the familiarization, users learn to interact with the exoskeleton, adjust their movement strategies, and manage any side effects associated with the device. This stage is characterized by instability in users' evaluations of the device. If users succeed in mastering the device, they transit to the routinization stage, which leads to sustained use. This stage is marked by a balanced and satisfactory quality of HEI for the user, an exoskeleton embodied, routine use of the device for its intended task, and exploration of its benefits for health and safety in new tasks. This formalization conducted to define new benchmarks and prevention actions.

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Magdalena is a molecular biologist and postdoctoral researcher at the Research Center of the Austrian Workers' Compensation Board (AUVA). Her work focuses on occupational health, with a particular emphasis on skin disease prevention. Her research aims to support evidence-based approaches to reducing occupational skin diseases and improving long-term skin health in exposed populations.

"Permeability of hazardous agents in cooling lubricants after application of occupational skin protection products"

Workers in various professions are routinely exposed to a variety of hazardous substances. Frequent contact with liquids, cleaning agents, or chemicals can damage the skin barrier, leading to skin diseases which became Austria's fourth most common occupational disease in 2023. As the use of gloves is not permitted during certain tasks for safety reasons, employers are obliged to provide suitable skin protective agents. These measures typically include the use of barrier creams (BCs) with various galenic compositions. As their efficacy remains highly controversial in literature, the present work aimed to investigate the influence of two BCs (Skotoderm® Universal Pure, and Herwederm® Protect Sensitive) on the permeation characteristics of formaldehyde (FA) and monoethanolamine (MEA), which are frequent contact allergens found in metalworking fluids (MWFs). Franz diffusion cells were used as the current gold standard method for testing in vitro penetration through the skin.

An appropriate study protocol was established using ex vivo porcine skin to assess the substance-specific permeability with and without prior use of the two protective agents. The amount of permeated test substances was analyzed by spectroscopic methods. The study demonstrated that the prior application of Skotoderm® and Herwederm® significantly reduced FA permeation through the skin ($p = 0.0322$ and 0.0420, respectively). Additionally, it was shown that the use of Herwederm® significantly reduced MEA permeation (from 5,84 % to 2,32 %, $p = 0,0318$), while the application of Skotoderm® did not affect the permeated amount (5,84 % vs. 5,80 %). Further in-depth studies are needed to validate these results and to draw definitive conclusions about the efficacy and utility of BCs with respect to individual selected hazardous working substances.

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Mairi Bowdler, MSc, is a researcher at TNO, holding an academic background in health and developmental psychology. She contributes to the 'Occupational Safety Innovation' team at TNO, where her research focuses on the impacts of technologies on occupational safety and health across various industries. Additionally, Mairi is a member of the Dutch Focal Point team for The European Agency for Safety and Health at Work.

"ALgorithmic MAnagement & Artificial Intelligence (ALMA-AI) systems as a new form of work organization: Psychosocial factors and implications for OSH based on statistical evidence in regular work."

In recent years, evidence-based research on the impacts of algorithmic management (ALMA) and AI tools on Occupational Safety and Health (OSH) has expanded beyond platform work into traditional workplaces.

This research explored statistical evidence from selected publications reviewed by the PEROSH "Algorithmic Management and AI systems" (ALMA-AI) project, focusing on new statistical evidence from 2022-2024. The analysis includes contributions from EU-OSHA and JRC, divided into job demands and psychosocial pressures, job resources and potential benefits, key OSH outcomes, and relevant moderators. The framework developed by Parent-Rocheleau and Parker (2022) was used to structure the analysis.

Higher psychosocial risks and additional OSH factors are associated with greater adoption of ICT technologies and intense ALMA practices, leading to excessive workload or job demands. Essentially, when more ALMA functions are used in the workplace, there is a higher likelihood of experiencing excessive workload or job demands. Regarding job resources and potential benefits, the studies pointed out that instead of reinforcing the job resources to deal with work demands, ALMA reduces them, thereby diminishing the opportunity to boost positive outcomes. Concerning the evidence on OSH implications, while ALMA is acknowledged to improve efficiency, the implementation often leads to adverse OSH outcomes, such as increased stress and various health issues. Finally, in connection with moderators involved in this topic, the analysis found that worker participation and transparency are key strategies to mitigate the negative impacts of ALMA.

The analysis provides a comprehensive overview of ALMA's impacts on workers in traditional workplaces, highlighting increased job demands and psychosocial risks, reduced job resources, and harmful OSH outcomes. Stakeholders should implement safer systems, emphasizing transparency and worker participation.

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Marcel Dörr completed his bachelor's degree in "Chemistry with Material Science" in 2023 at Bonn-Rhein-Sieg University of Applied Sciences. Then he started a master's degree in "Analytical Chemistry and Quality Assurance" and is writing his master's thesis at the Institute for Occupational Safety and Health (IFA) at the Department of hazardous substance exposure using aerosol measurement technology. His research focus is on high volume personal aerosol samplers.

"Development of high-volume personal aerosol samplers"

Dust can be generated during many different work processes. Therefore, it is necessary to know the dust concentration in workplaces for the safety of the employees. Especially in case of carcinogenic species it is important to know the concentration and to check it frequently if something changed as they are associated with greater health effects. The decrease of their occupational exposure limit values in recent years imply to achieve lower limits of quantification. To accomplish this, it is possible to extend the sampling time, increase the flow rate or improve the analytical method.

A set of four prototypes was designed. They aim for a flow rate of 20 l/min and collect the inhalable dust fraction. This allows shorter sampling times than a full shift. For evaluation and comparison, the prototypes were evaluated according to EN 13205 and EN 481. EN 13205 requires to test the samplers with two different air velocities, namely 0.1 m/s in the chamber and 1.0 m/s in the wind tunnel, and apply dusts with different particle sizes. The sampling efficiency was determined in comparison with isokinetic reference samplers. Also validated samplers were compared with the prototypes. First steps to ensure reproduceable results were adjusting the dust chamber as well as the wind tunnel. Finally, the measurement uncertainty has to be considered. This aspect was estimated according to EN 13205 and EN 481 including the limit of the analysis method.

The talk will summarize the results of the project, which test condition of the wind channel fits best, and which prototype outperformed the other ones.

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Dr Marie Jelenko is a specialist in sociological issues relating to occupational safety and health protection. Since 2008, she has worked at the Austrian workers' compensation board (AUVA), leading various prevention campaigns. She is currently working on the AUVA campaign 'Gemeinsam sicher digital', which addresses the intersection of digitalisation and occupational health and safety.

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Swantje Robelski is a research associate in the group "Occupational Safety and Health (OSH) Systems in transformation; Coordination of Occupational Safety and Health structures" at the department "Changing World of Work" of the Federal Institute for Occupational Safety and Health (BAuA). Her work focuses on the implications of digitalization for workplace safety. In her research, she investigates how emerging technologies can help strengthen safety practices both within companies and across institutional frameworks.

"OSH for All? Exploring the Role of LLM-based Chatbots in Enhancing Access to Health and Safety Information"

Chatbots powered by large language models (LLMs) have become integral to daily life, offering support for both personal and work-related matters. Applications in occupational safety and health (OSH) are discussed and increasingly being explored, as freely accessible chatbots provide low-threshold and easy-to-understand information to both employees and professionals for health and safety. Despite these benefits, questions regarding the reliability and accuracy of chatbot-generated information remain largely unanswered.
To fill this gap, a joint project between AUVA and BAuA was launched with the aim of developing guidelines for the use of chatbots in the field of OSH. The project focused on understanding the practical implications of chatbot use, investigating both their potential and limitations.
Using a user-centred approach, specific use cases were identified and tested with large language models. The use cases were outlined as user stories representing various OSH stakeholders, including inspection personnel and occupational health and safety professionals. Based on these scenarios, criteria for selecting and interpreting LLM-generated results were established. An expert evaluation of these criteria provided further insights.
Chatbots can be used for a broad range of applications. And while they offer a low-threshold approach and enhance accessibility to OSH information, several constraints must be taken into consideration. These limitations refer to both, prompting and result interpretation and highlight the need for expert oversight, as errors—whether in the form of incorrect answers or omissions—require domain-specific knowledge to identify and correct.
In our presentation, we provide an overview of the steps, methods, and key insights from our project that can serve as basic criteria for the use of chatbots in OSH. With a view to practical relevance, we illustrate this using concrete examples of chatbot applications in OSH.

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Conducting research projects with a primary focus on (participatory) interventions, implementation research, and qualitative evaluation.

"Embedding Behavioural Safety in the Green Transition: A Participatory Approach to Reducing Biological Exposure among Waste Collection Workers"

Occupational exposure to biological agents such as fungi, bacteria, and endotoxins remains a significant health risk for waste collection workers. The green transition intensifies this occupational health challenge, as the introduction of new waste sorting and collection practices, e.g. reduced frequencies of waste container emptying, leads to increased worker exposure.

Despite existing knowledge about reducing risk factors – such as vehicle hygiene, hand sanitation, and protective measures when handling the waste – implementation of effective safety practices remains a challenge. This project investigates how a participatory intervention can reduce such exposures by integrating behavioural design, implementation science, and exposure measurement.

The intervention uses participatory observations, interview- and questionnaire data for a comprehensive assessment of waste-collectors daily work, to identify practical obstacles and possibilities to reduce biological risk factors. Based on those suggestions for improvement will be co-developed with workers, but will also address the other organisational levels of the IGLO-principles (Individual, Group, Leader, Organisation). The project applies realistic evaluation methods to examine intervention uptake (process evaluation focussing on the impact of context and mechanisms on outcomes). Exposure levels are assessed through pre- and post-intervention measurements in both the intervention and the control group (evaluation of reduction of exposure).

By bridging different scientific fields, the project aims to provide actionable insights into how to implement scientific knowledge into daily routines in high-risk industries.

Being at the early-stages of the project (timeline: 2025-2027), the presentation will focus on the project design, the underlying expectations with regard to how the program is supposed to lead to improvements and present preliminary results from baseline measurements.

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She is the author of a literature review conducted at the agency, the findings of which she'll present at the conference. Her presentation is entitled "How Fraud and Undeclared Work Degrade Work Environments and Exploit Workers across Different Industries." This literature review was initiated due to the significant prevalence of this problem in many countries.

"How Fraud and Undeclared Work Degrade Work Environments and Exploit Workers across Different Industries: A Literature Review"

Background: Fraud and undeclared work in the labor market have become a growing issue worldwide. These practices often involve poor work environments and worker exploitation. This literature review aims to identify and analyze existing scientific studies and grey literature concerning how fraud and undeclared work affect the work environment and exploit workers.

Methods: This literature review is based on 39 publications, including 33 scientific studies and grey literature, from the EU, Norway, and Canada. The search was conducted in the databases PsycInfo, Scopus, and Sociological Abstracts & Social Service Abstracts, limited to include literature published between 2013 and 2024. The focus is on industries such as land-based industry, hotel and restaurant, health and welfare/domestic work, construction, vehicles and transport and cleaning.

Results: This study demonstrates that working in practices where fraud and undeclared are present often involves workers' being exploited and having a poor work environment. This is regardless of gender or industry. Often, the exploited workers face language barriers and they enter employment contracts without fully understanding their implications. Other common issues include working with a high work pace and working long days with few opportunities for recovery, wage theft, working in high temperatures, safety hazards, lack of control and support, and experiencing discrimination, threats, and harassment. Different risks are present in male- and female-dominated industries.

Conclusion: This study highlights the urgent need to address the detrimental impact exploitation has on workers' work environments. By understanding both specific and general challenges faced by workers, policymakers, and practitioners can develop effective strategies to combat exploitation and improve working conditions.

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"Balancing Accuracy and Wearability: Sensor Configuration Strategies for Real-World Near-Fall Detection"

Slips, trips, and falls (STFs) are significant occupational risks, contributing to injuries, disability, and economic loss in sectors such as logistics, transport, healthcare, and manufacturing. Although IMU-based wearable systems combined with deep learning offer accurate near-fall detection, their workplace use remains limited due to factors including complexity, poor user acceptance, and high costs.

The present study investigates the potential for optimising sensor configurations with a view to reducing sensor count while maintaining accuracy. Three strategies were tested: bilateral reduction, unilateral reduction, and placement at biomechanically relevant sites. The Prev-Fall dataset was utilised to conduct simulations, with the objective of evaluating performance across various occupational settings. The following four deep learning models were assessed: CNNs, ResNets, DeepConvLSTMs, and InceptionTime.

The findings demonstrate that optimised two-sensor setups at key anatomical locations can match the performance of larger configurations, achieving over 80 percent accuracy and an F1-score above 0.8. However, a reduction in the number of sensors from three to two resulted in an increase in misclassification, particularly between the categories of slips and missteps. This finding suggests the presence of a practical lower limit. The efficacy of DeepConvLSTMs was found to be optimal in conditions of reduced sensor functionality, underscoring the necessity for model selection to be aligned with sensor layout.

The findings of this study provide a robust foundation for the development of cost-effective, acceptable wearable solutions for fall detection and, in the longer term, prevention in occupational environments.

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Nicoletta Godas is a certified food chemist who specialized in regulatory affairs and product safety. Her career began in the field of consumer protection, but she later became more involved in occupational safety. This shift was driven by her work with the REACH Regulation, a European chemicals regulation, particularly in the area of risk communication.

She has worked in Department 4, Hazardous Substances and Biological Agents, at the Federal Institute for Occupational Safety and Health for 12 years. She is currently focusing on the interface between science, regulation and practice, addressing the challenges and opportunities for occupational safety and health (OSH) within various EU regulations and strategies, including those related to climate change, circular economy and sustainability.

"Challenges and chances for occupational safety and health in circular economy"

Substances that are carcinogenic, mutagenic or toxic to reproduction are of particular concern under European chemicals legislation and pose a challenge for occupational health and safety.
Ideally, substances of very high concern would be eliminated from all material cycles in order to protect human health and the environment.
However, these substances are also critical raw materials, so increasing their extraction and recycling is essential for ensuring the EU's resilience. The EU Commission estimates that around 800,000 new jobs will be created in the EU's battery sector.
Since an average electric car battery contains 24 kilograms of cobalt and nickel compounds, it is paramount that those involved in the recovery process are kept safe.
Although battery recycling plants are subject to approval under accident prevention legislation, this only applies to fire and explosion hazards, as well as acute toxic substances.
Occupational safety is not covered by this approval process.
Nevertheless, plant operators must carry out risk assessments and implement the necessary protective measures before starting work.
The Federal Institute for Occupational Safety and Health is set to launch a project addressing inhalation and dermal exposure during various battery recycling activities.
The circular economy should therefore also be seen as an opportunity to improve occupational safety.
When adapting workplaces to new processes or creating new ones, they can be designed to be safe from the outset. This could potentially prevent future occupational diseases and prevent the suffering experienced by those affected.

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"Extended Reality in Ergonomics - Training with own Avatar"

XR simulations have found their way into ergonomic studies. However, a lot of questions related to the impact of XR in ergonomics need to be researched on a bigger scale. Our approach, to contribute to that topic, was to get scientific indicators about effectiveness and user acceptance on XR supported ergonomic training.

We determined if specific tasks, that could be rated for their ergonomical performance, have been executed better with virtualized help when it comes to the usage of XR.

To answer the questions, we created an application. Within that an animated avatar is performing certain exercises, with focus on ergonomic parameters. These included manual load handling tasks. The animation used for the avatar was prerecorded, using a motion capture suit. In our experiment, users had to execute tasks without visual guidance from the virtual avatar first. Then, they had to use the MR devices to get visual help in order to execute the given tasks.

The experiment was performed with employees of a central warehouse in Austria. To measure the ergonomic quality of the performance, a video analysis system for automated ergonomic assessment, called "ErgoMaps", was used. In addition, users had to answer a questionnaire to determine acceptance. The MR applications were evaluated with a NPS score of -38,89% (n=18), indicating that more users would not recommend that form of training, while the VR application was evaluated with a NPS score of -11,11% (n=18), indicating that more users would not recommend that form of training. On the other side the results of "ErgoMaps" indicate higher quality results in relation to the ergonomic parameters, when the users were supported by the MR experience (compared to no XR guidance).

While this was just a small study, it shows strong indications into certain directions: users seem to be skeptical towards XR training in the field of ergonomics. However, XR usage can improve qualitative outcome of ergonomic parameters.

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“Evaluation of the load on bicycle delivery services using the 3D-musculoskeletal-model "Myonardo”

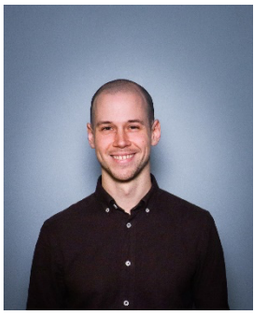
Recent reports indicate that the physical strain experienced by bicycle delivery workers, referred to as "Riders," during their workday is excessively high. To date, no scientific studies have conclusively demonstrated the specific physical strain these transport boxes and the weight they carry impose on the Rider's body. Therefore, this research aims to address several key questions regarding the joint forces, the impact of various carrying weights, and the comparison of these forces to those experienced during lifting and carrying tasks.

The primary research questions for this study are:

1. What joint forces act on the Riders during their work?
2. How do varying weights in the transport boxes influence the forces exerted on the Rider’s body?
3. How do these forces compare to those experienced during lifting and carrying tasks?
4. What level of such physical strain can be considered harmful to health in comparison to lifting and carrying?

The delivery workers use transport boxes, carried on their backs while cycling. The transport boxes and their weight, including the contents, can range from 14 to 19 kg. Given that direct measurement of these forces is not ethically possible, the study utilizes a 3D musculoskeletal model (Myonardo) to simulate these forces. The model helps estimate the forces acting on the Rider’s body, taking into account both external forces from the transport box and the muscle forces acting on the body’s joints.

The study will include 10 male and 10 female participants who will be measured in various conditions. The expected results of this study aim to provide a detailed comparison of joint forces during different activities, with a particular focus on the forces exerted while cycling with the transport box. These forces will then be compared to those typically experienced during lifting and carrying tasks. This comparison will help determine a threshold for what level of physical strains could be considered as harmful to the health.



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I am a postdoc with a background in molecular biology, working in the Research Group for Occupational Toxicology at the National Institute of Occupational Health (STAMI) in Norway. As part of the EU-funded PlasticsFatE project, my research has focused on investigating potential hazardous effects of micro- and nanoplastics both in vitro and in vivo. I have also contributed to assessing exposure levels of airborne plastic particles in occupational settings.

"Occupational exposure to micro- and nanoplastics in a plastic bottle recycling facility in Norway"

Background

Micro- and nanoplastics (MNPs) are a growing issue due to their persistence and presence in the environment, including workplaces. Microplastics range from 1 µm to 5 mm in diameter, while nanoplastics are smaller than 1 µm. In occupational settings, airborne MNPs can form during industrial processes involving mechanical stress and heat, potentially exposing workers. Although health effects remain unclear, the presence of MNPs in human organs raises cause for concern. Currently, no occupational exposure limit (OEL) exists for airborne MNPs due to limited data on exposure and toxicity.

Aim

The aim was to characterize airborne MNPs in a plastic bottle recycling facility by assessing particle sizes and concentrations, as well as polymer mass concentrations.

Methods

Two field campaigns were conducted at a Norwegian facility recycling polyethylene terephthalate (PET) bottles into granules through shredding, cleaning, and heat treatment. In the first campaign, stationary PAS6 air samplers (n=11) and direct reading instruments (SMPS and APS) were deployed inside the processing hall near the heat reactor and silos containing shredded plastic, with background measurements carried out in the office area. In the second campaign, size-fractionated air samples (10 µm to <0.25 µm) were collected on quartz filters using stationary Sioutas cascade impactors (n=6). Polymer mass concentrations were determined by pyrolysis-GC/MS.

Results

Airborne dust in the recycling hall averaged 0.21 mg/m³, well below the OEL for organic dust (5 mg/m³). However, direct-reading instruments showed significantly higher particle number concentrations than background, with most particles being in the size range of 50–200 nm. Pyrolysis-GC/MS confirmed PET in all size fractions, including the ultrafine fraction (<0.25 µm).

Conclusion

Our findings indicate that workers may be exposed to airborne MNPs emitted during plastic processing.

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I hold a Bachelor's Degree in Biomedical Science and a Master's Degree in Genetics and Cell Biology. Currently, I work as a Senior Occupational Risk Prevention Technician at the Technical Unit for Biological Agents of the Spanish National Institute for Safety and Health at Work (INSST).

"Influence of climate change on the exposure to vectors that transmit infectious diseases at workplaces"

The incidence and prevalence of emerging infectious diseases and reemerging infectious diseases is increasing globally. Out of these diseases, 17% are transmitted by arthropod vectors. The increase in the spread and emergence of vector-borne diseases is due to global change, a consequence of human activity. One of the main factors caused by global change is climate change, which has both direct and indirect implications on the scope and distribution of biological agents, as well as their associated vectors and host species. This represents a risk to the safety and health of people who work outdoors, especially those in close contact with nature. According to an ILO report published in 2024, parasitic and vector-borne diseases cause over 15.170 work-related deaths each year. Due to the importance of this data and the current global situation, it is essential to raise awareness about the necessary measures to adequately prevent risks and ensure the protection of the working population's health and safety.

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Riikka Ruotsala is a senior specialist at the Finnish Institute of Occupational Health, with over 20 years of experience in research and development projects related to workplace safety, organizational learning, and human factors. Her PhD research focuses on the evolving roles of safety professionals, offering insights into advancing safety practices in today's work environments.

"Examining the expansive object of safety professionals' work in Finland"

Occupational safety and health (OSH) is experiencing changes due to complex global developments in the world of work, leading to new risks and challenges in workplaces. In addition to addressing these substantive OSH concerns, the work of safety professionals—those at the forefront dealing with the challenges—needs focused attention. In both academic and practical fields, there is ongoing debates about which approaches are most effective and what future direction should be pursued. Further, the literature tends to define the "right" roles and tasks for safety professionals without system level analysis of the changes affecting their work. Although the studies highlight tensions and complexities, they often fail to propose solutions for overcoming them. This study aims to fill this gap by examining the dynamics of safety professionals' evolving work by implementing an intervention study that involves safety professionals in a collective learning process.

Drawing on Cultural-Historical Activity Theory (CHAT), and the theory of expansive learning (Engeström, 1987), the study presents a systemic model of activity system and the concept of contradiction for understanding the changes in safety professionals' work. The data consist of three Change Laboratory sessions where Finnish safety professionals analyze and model their work activities. The presentation will outline the ongoing study, discussing the need for collaborative approaches and shared frameworks to reframe safety professionals' future work.

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Robert is an Associate Professor in Environmental Psychology with 20 years of research experience. He works as an Analyst at the Swedish Agency for Work Environment Expertise and has been Project Manager for the project *Lessons Learned from the COVID-19 Pandemic for Occupational Safety and Health: An International Comparison*.

"Lessons Learned from the COVID-19 Pandemic for Occupational Safety and Health; An International Comparison"

The COVID-19 pandemic profoundly affected working life, occupational safety, and health (OSH) across Europe. This presentation is based on a synthesis of seven national reports from Sweden, Germany, England, France, Austria, Poland, and the Netherlands, conducted within the PEROSH network. The aim was to explore key lessons for future crisis management in the OSH field, structured around five overarching questions.

The report highlights similarities and differences in national strategies and workplace measures to prevent the spread of infection and the impacts of these interventions on working conditions and health. It also examines the roles played by national OSH institutes in producing knowledge and informing policy. A recurring theme across the reports is the acceleration of digitalisation and remote work, with some countries transitioning to lasting hybrid models. At the same time, increased mental health challenges, unequal impacts on vulnerable groups, and the need to improve preparedness within OSH systems are widely acknowledged.

Despite the challenges, the reports identify several positive developments, such as improved hygiene practices and novel collaborations between researchers, authorities, and employers. The concluding recommendations emphasise the need for stronger cross-sectoral collaboration, improved data collection and analysis, and the development of sustainable OSH guidelines, for example, on remote work practices. The role of PEROSH is also discussed, with a call for it to play a more central role in supporting research, disseminating knowledge, and informing policy in response to future health crises.

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"Sick leave and occupational status. A decomposition analysis from Norway"

Sickness absence (SA) serves as a general indicator of ill health and limited functioning, and socioeconomic disparities in SA are well-documented. Growing evidence suggests that working conditions contribute significantly to these disparities. But social gradients in health or SA could be related to both work and non-work factors, and work demands may be related to socioeconomic status (SES) and/or SA in different ways. Also, empirical work on the SES-SA association often stops at description, while attempts at explaining social disparities are rare.

In this study, we estimate the relative contribution of different work environment factors (ergonomic, physical environment and psychological demands and job autonomy), and work- and non-work-related health problems, to the social gradient in sick leave in Norway. The data on self-reported work environment factors and health problems are from a nationally representative cross section of employees from 2022 (N=11800), coupled with data on sick leave and different indicators of socioeconomic status (occupational status, wages, education and income) from administrative registers. The social gradient in sick leave is measured by the concentration index (Kakwani et al 1997) and regression-based decomposition methods are used to estimate the relative contribution of various factors to the social gradient.

The results show that the direction and strength of the social gradient in SA varies across different measures of SA and with the choice of ranking variable. When occupational status (ISEI) is used as the ranking variable, a concentration index of -0,096 is found in registered sick days (indicating that higher status occupations have fewer sick days). The decomposition analysis show that the uneven distribution of work environment factors (in particular ergonomic demands and autonomy) contributes around 50% to the negative social gradient in registered sickdays across jobs ranked by ISEI.

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Steven is a data and digital research portfolio lead within the Health and Safety Executive (HSE), the national regulator of health and safety for Great Britain, working within its Science and Research Centre, and part of the technical delivery team on the HSE's Discovering Safety Research Programme. He's part of a team of scientists who deliver projects for the HSE, government departments and for industry, both in the UK and internationally. Steven's main areas of research interests centre around the use of data analytic techniques to generate intelligence from datasets to support better health and safety decision-making.

"Discovering Safety's Construction Risk Library - A knowledge tool to support design risk treatment on construction projects"

Designers working on construction projects often lack the requisite tacit health and safety subject matter expertise to be able to devise effective design risk treatment strategies, a key legal requirement under the UK Construction Design and Management regulations. As a result, rather than opportunities being taken to eliminate risks at the preconstruction stages of projects, they are often left for the project teams working at the construction phase of a project to deal with them, which tends to be a much less effective strategy. HSE developed its Construction Risk Library (CRL) knowledge asset as part of its Discovering Safety Research Programme. The CRL is a digital knowledge resource to support designers working on construction projects in meeting their legal duties under the UK Construction Design and Management regulations to eliminate, reduce or control foreseeable health and safety risks and to evidence the process. A designer is able to characterise a health and safety risk scenario linked to their project design using the tool and the tool returns a risk treatment prompt to help the designer eliminate or reduce the risk through the design process. This presentation describes the research work undertaken to develop the tool and how it is being made available for industry use.

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"From Past Insights to Future Challenges in the Age of Digital Transfor-mation: A Scoping Review on Labour Inspectors"

Labour inspection remains a central pillar of occupational safety and health (OSH) enforcement. Yet, inspectors' routines are increasingly shaped by complex social, organisational and technological change. A recently completed scoping review of 32 publications examined the working conditions of labour inspectors, with particular attention to how digitalisation and technology are addressed in the literature.

The findings show that while organisational and social demands are frequently discussed, digital aspects are strikingly underrepresented. Few studies explicitly address technological tools, data-based inspection, or algorithmic management – despite their potential to transform inspection systems. Thus, there is a strategic knowledge gap in understanding the impact of technology use in labour inspection, although they might be highly relevant in preparing labour inspection for the digital age.

Based on these knowledge gaps, the contribution identifies key fields of tension and proposes guiding questions for future research and policy. How can technology support rather than constrain inspectors' discretion? What forms of digital support do inspectors consider meaningful and trustworthy in their day-to-day practice?

These reflections inform a new PEROSH project aimed at conducting a cross-country survey among labour inspectors to investigate the actual role of digitalisation and new technologies in inspection practice. By combining review findings and future empirical data, the project aims to support the development of inspection systems that are both resilient and responsive to technological disruption.

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Szymon Warszawski is a young researcher with a background in psychology. His academic interests focus on psychometrics, artificial intelligence, statistics, and neuropsychology. Currently involved in a project on psychosocial working conditions. This research focuses on how psychosocial factors in the work environment affect employee wellbeing and job satisfaction.

"Precarious work, psychosocial working conditions and job satisfaction as predictors of employees wellbeing: what matters most?"

Introduction

Working conditions are regarded as one of main wellbeing determinants among employees (Leka et al., 2011). Poor psychosocial working conditions such as excessive demands, lowered sense of influence, negative social interactions, workplace violence, long working hours, and many others have been linked with reduced wellbeing in numerous studies (Brucks et al., 2023; Rugulies et al., 2006; Schütte et al., 2014). For example, poor working conditions can influence job involvement and increase absenteeism (Harnois & Gabriel, 2000; Rugulies et al., 2010).

Recently, research in occupational psychology has focused on addressing the various influences of precarious working conditions on mental health and wellbeing (Baek et al., 2023; Irvine & Rose, 2025; Pulford et al., 2022).

While numerous studies have been conducted regarding psychosocial working conditions as an important factor for wellbeing in the workplace, the specific influence of precarious work remains underexplored.

Aims of the study

The goal was to broaden current knowledge about how various work related factors – including precarious working conditions, influence, and quantitative demands, and job satisfaction – affect mood and wellbeing.

Method

The research was conducted in 2023 in CAWI form. The study group consisted of 1,057 workers from the Polish population. To evaluate precarious conditions, the Polish adaptation of the EPRES II scale was applied (Stachura-Krzyształowicz et al., 2023). To further expand the model's predictors, three COPSOQ II scales were used: job satisfaction, quantitative demands, and lowered sense of influence. Data from both scales were used to model outcomes of the WHO-5 scale, a common five-item questionnaire widely used to assess various factors influencing one's wellbeing (Topp et al., 2015).

Results

Results are being analyzed and will be presented at the conference.

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Tony works as a Senior Operational Policy Officer in the Chemical Regulations Division of the Health and Safety Executive. His particular responsibility revolves around improving HSE's understanding of new technologies in the application of plant protection products (PPPs) and identifying policy actions on how to accommodate these technologies whilst maintaining the integrity of the PPP regulations in the UK. Tony has a background in crop research and agricultural education with a particular interest in genetics and agronomy.

"Using Drones to Apply Plant Protection Products: work to understand potential exposure routes and risks to operators"

Interest in using drones to apply plant protection products (PPPs) has been rising in recent years. This is understandable as drone technology has become an increasingly viable, cost effective PPP application option. Major improvements in the control of drones via accurate GPS systems and the ability to capture flight and PPP application data have enabled drone operators to meet a number of key regulatory requirements.

From the perspective of managing the risks to operators, drones represent some potential major gains. Many of the places that plant weed species grow, such as high buildings, bridges and embankments are not easily accessible and often require additional equipment and training to mitigate risks. The application of PPPs by drones removes the need for many of these additional measures and the risks that are associated with them.

A major international effort is underway to better understand the risks specific to the application of PPPs by drones. Trials have been conducted by industry-actors to generate data that describes the drift of a PPP once it leaves the drone and the exposure to operators and bystanders that might ensue. Work is also underway to understand the tasks involved in handling PPP, including loading, cleaning and transporting of the drone, as well as measures of productivity, such as area sprayed and number of times the drone is loaded. These data will help to predict daily handler and operator exposure and provide risk assessors and scientific specialists in HSE with sufficient data and evidence on which to base decisions regarding the risks associated with the application of PPP by drone. This presentation will describe these initiatives in more detail and set out some of the regulatory challenges posed by the applications of PPPs by drones.

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Thank you for your participation

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Certificates of attendance will be distributed at the end of the conference. If you attended but did not collect yours, contact us at info@perosh.eu.

The Book of Abstracts and presentations from consenting speakers will soon be available in the PEROSH repository. Subscribe to our website newsletter for updates on PEROSH news and events. Session videos from consenting speakers will be published on our YouTube channel.

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