

# Improving worker health in the wind turbine industry – an evaluation of three workplace interventions in Denmark, Spain and Portugal

<b>Submission date</b>	<b>Recruitment status</b>	[X] Prospectively registered
10/12/2024	No longer recruiting	<input type="checkbox"/> Protocol
<b>Registration date</b>	<b>Overall study status</b>	<input type="checkbox"/> Statistical analysis plan
13/12/2024	Ongoing	<input type="checkbox"/> Results
<b>Last Edited</b>	<b>Condition category</b>	<input type="checkbox"/> Individual participant data
18/08/2025	Skin and Connective Tissue Diseases	[X] Record updated in last year

## Plain English summary of protocol

### Background and study aims

As a part of an EU-funded research project, this study aims to improve the physical and mental health of workers in the wind turbine blade (WTB) manufacturing industry. The main effort of this study will involve the development, implementation and evaluation of a workplace intervention involving ultraviolet illumination systems that will allow workers to detect and respond to skin contamination by epoxy resins, a potent allergen.

Over the course of the study, the researchers will encourage employers and workers to take ownership of the intervention so they may continue to refine and adapt it after the study has been completed. Where appropriate, the researchers will identify and share best practices with the wider industry. Finally, by empowering workers from green industries to take ownership of their health and safety, the aim is to promote a culture of honesty and trust in the workplace.

### Who can participate?

Workers aged 18 to 70 years directly involved in the production of WTBs made of composite materials in three predetermined study sites at factories in Denmark, Portugal and Spain

### What does the study involve?

The study period is about 1 year and comprises a survey and skin patch testing, as well as the characterisation of work experiences using lightweight sensors in a small subset of the participants at baseline.

### What are the possible benefits and risks of participating?

The benefit of participating in this study is the opportunity to be involved in the evaluation of a robust workplace intervention with a potential impact on the health of workers in the WTB manufacturing industry. The risks of the study are minimal for the survey and characterisation efforts. Patch testing is a non-invasive and generally safe procedure. It may nevertheless cause local irritation to the skin with itching, swelling and discomfort. Local irritation might in rare circumstances be complicated by a skin infection that may require a visit to a primary care provider for assessment and topical treatment.

Where is the study run from?

1. Department of Occupational Medicine, Aarhus University, Denmark
2. Barcelona Institute for Global Health, Barceolna, Spain
3. Escola Nacional de Saúde Pública, Universidade Nova de Lisboa, Lisbon, Portugal

In keeping with confidentiality agreements, the three study sites (WTB factories) are not named

When is the study starting and how long is it expected to run for?

January 2024 to December 2028

Who is funding the study?

This study is funded by HORIZON Europe Programme - Evidence-based interventions for promotion of mental and physical health in changing working environments (HORIZON-HLTH-2023-ENVHEALTH-02-02)

Who is the main contact?

1. Prof. Henrik Kolstad, henrkols@rm.dk
2. A/Prof. Michelle Turner
3. Prof. Susana Viegas

## Contact information

**Type(s)**

Principal investigator

**Contact name**

Prof Henrik Kolstad

**ORCID ID**

<https://orcid.org/0000-0002-6535-4323>

**Contact details**

Dept of Occupational Medicine  
Aarhus University Hospital  
Indgang C, krydspunkt C107  
Palle Juul-Jensens Boulevard 99  
Aarhus  
Denmark  
8200  
+45 (0)78 45 00 00  
henrkols@rm.dk

**Type(s)**

Public, Scientific

**Contact name**

Dr Alexander Gorny

**ORCID ID**

<https://orcid.org/0000-0003-3527-2228>

**Contact details**

Dept of Occupational Medicine  
Aarhus University Hospital  
Indgang C, krydspunkt C107  
Palle Juul-Jensens Boulevard 99  
Aarhus  
Denmark  
8200  
+45 (0)78 45 00 00  
alegor@rm.dk

## Additional identifiers

### Clinical Trials Information System (CTIS)

Nil known

### ClinicalTrials.gov (NCT)

Nil known

### Protocol serial number

INTERCAMBIO WP7 Intervention Protocol

## Study information

### Scientific Title

INTERCAMBIO Work Package 7: Interventions to promote mental and physical health in changing working environments: Renewable energy/wind turbine workers

### Acronym

INTERCAMBIO WP7

### Study objectives

Exposure and sensitisation to epoxy resins is a persistent problem in the wind turbine blade (WTB) manufacturing industry. The hypothesis is that a co-created workplace intervention using ultraviolet (UV) light systems will reduce skin sensitisation risk.

### Ethics approval required

Ethics approval required

### Ethics approval(s)

1. approved 26/05/2025, Research Ethics Committees of Central Jutland Region (Regionssekretariatet, Juridisk kontor Skottenborg 26, Viborg, 8800, Denmark; +45 (0)78 41 01 83, +45 (0)78 41 01 82, +45 (0)78 41 01 81; komite@rm.dk), ref: 1-10-72-168-24
2. approved 07/04/2025, CEIm - Hospital del Mar (1<sup>a</sup> planta, espai 163.05 c/Doctor Aiguader, 88 (Edifici PRBB), Barcelona, 08003, Spain; +34 (0)93 316 06 77; ceic-psmar@imim.es), ref: 2024 /11888/I
3. approved 13/11/2024, Comissão de Ética da Escola Nacional de Saúde Pública da Universidade Nova de Lisboa (CE-ENSP) (Avenida Padre Cruz, Lisbon, 1600-560, Portugal; +351 (0)961 980 960; comissaoetica@ensp.unl.pt), ref: 64/2023

4. approved 07/11/2024, Aarhus University Research Ethics Committee, c/o Fakultetssekretariatet, Health (Vennelyst Boulevard 4, bygning 1267, 211, Aarhus C, 8000, Denmark; +45 (0)8715 0000; forskningsetiskkomite\_health@au.dk), ref: 2024-18

### **Study design**

Multi-centre quasi-experimental study

### **Primary study design**

Observational

### **Study type(s)**

Prevention, Safety

### **Health condition(s) or problem(s) studied**

Skin sensitisation and allergic contact dermatitis in persons occupationally exposed to epoxy resins

### **Interventions**

Primary Intervention:

Improvements in the detection of skin contamination with epoxy resins using UV light systems.

Secondary Intervention:

Improvements in worker education and risk communication

Control:

Retention of current work-practices

### **Assignment:**

The basic unit of allocation to intervention or control conditions in this study is the work team. Employers will consider a range of factors such as plant operations, logistics and human resources before determining the allocation of work teams a priori, without randomisation. The role of the researchers will be to guide employers in the development and practical implementation of the intervention.

### **Duration of intervention:**

Work teams will utilize the novel UV light systems for a period of 1 to 12 months depending on factors such as plant operations and logistics.

### **Follow-up:**

Participants will undergo a second round of assessments 6-12 months post-intervention

### **Intervention Type**

Device

### **Phase**

Not Applicable

### **Drug/device/biological/vaccine name(s)**

Ultraviolet light detection and visualisation systems

### **Primary outcome(s)**

Skin sensitisation status assessed using skin patch testing at baseline and 6 to 12 months post-intervention

### **Key secondary outcome(s)**

1. Self-reported symptoms of hand and forearm eczema measured using the Nordic Occupational Skin Questionnaire (NOSQ) at baseline and 6 to 12 months post-intervention
2. Self-reported effects of eczema on daily life measured using the NOSQ at baseline and 6 to 12 months post-intervention
3. Self-reported well-being measured using the World Health Organisation 5 Well-Being Index at baseline and 6 to 12 months post-intervention
4. Self-reported depressive symptoms measured using the Center for Epidemiologic Studies Depression scale at baseline and 6 to 12 months post-intervention
5. Self-reported health measured using the Self-rated Health question at baseline and 6 to 12 months post-intervention
6. Self-reported productivity loss measured using the PROductivity and DISease Questionnaire (PRODISQ) at baseline and 6 to 12 months post-intervention

### **Completion date**

31/12/2028

## **Eligibility**

### **Key inclusion criteria**

1. Participant is able to read and understand briefing materials, participant information sheets, voluntary informed consent or survey forms provided in English, Danish, Spanish or Portuguese
2. Participant is willing and able to give informed consent for participation in the study
3. Participant has direct employment in WTB production at the manufacturing facility, i.e. is not employed via a contractor
4. Aged 18 to 70 years
- 5.1. Either performs tasks involving the application of uncured epoxy resin to be recruited as an exposed production worker
- 5.2. Or performs any other tasks relating to the production on the factory floor, e.g. delivering goods and materials, transporting products, or preparing composite materials in moulds, to be recruited as a non-exposed production worker

### **Participant type(s)**

Employee

### **Healthy volunteers allowed**

No

### **Age group**

Adult

### **Lower age limit**

18 years

### **Upper age limit**

70 years

**Sex**

All

**Key exclusion criteria**

1. Specifically concerning patch-testing:

1.1. Participant is taking more than 10 mg oral prednisolone daily for any condition

1.2. Participant is on any other form of immunosuppressive therapy

1.3. Participant has previously been diagnosed with occupational, contact or atopic dermatitis of the hands/forearms

2. Specifically concerning post-intervention patch testing:

2.1. Participant has produced a skin response suggesting sensitisation at baseline during this study

**Date of first enrolment**

01/07/2025

**Date of final enrolment**

31/01/2026

## Locations

**Countries of recruitment**

Denmark

Portugal

Spain

**Study participating centre****Aarhus University**

Institute for Clinical Medicine

Aarhus University Hospital

Indgang C, krydspunkt C107

Palle Juul-Jensens Boulevard 99

Aarhus N

Denmark

8200

**Study participating centre****Barcelona Institute for Global Health**

Barcelona Biomedical Research Park (PRBB)

Doctor Aiguader, 88

Barcelona

Spain

08003

**Study participating centre**  
Escola Nacional de Saúde Pública  
Universidade Nova de Lisboa  
Av. Padre Cruz  
Lisbon  
Portugal  
1600-407

## Sponsor information

**Organisation**  
Project INTERCAMBIO

## Funder(s)

**Funder type**  
Government

### Funder Name

The European Union's Horizon Europe Research and Innovation programme under Grant Agreement No 101137149 (INTERCAMBIO)

## Results and Publications

### Individual participant data (IPD) sharing plan

In order to facilitate that the data generated by the project is findable, the datasets will be published in the INTERCAMBIO ISGlobal Dataverse data repository, suitable for EC-funded research. This repository is free to access, facilitating that everyone can find and use the data generated by the INTERCAMBIO project. The repository enables linking research outputs to datasets and funding information, which also facilitates that anyone interested in the project or in project publications can find the relevant data.

### IPD sharing plan summary

Stored in publicly available repository

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Participant information sheet</a>	Participant information sheet	11/11/2025	11/11/2025	No	Yes
<a href="#">Study website</a>	Study website	11/11/2025	11/11/2025	No	Yes