Online meeting, 22 October 2020

Musculoskeletal disorders prevalence, prevention and policy: what have we learnt? Evidence from EU-OSHA research

MSDs prevention in agriculture

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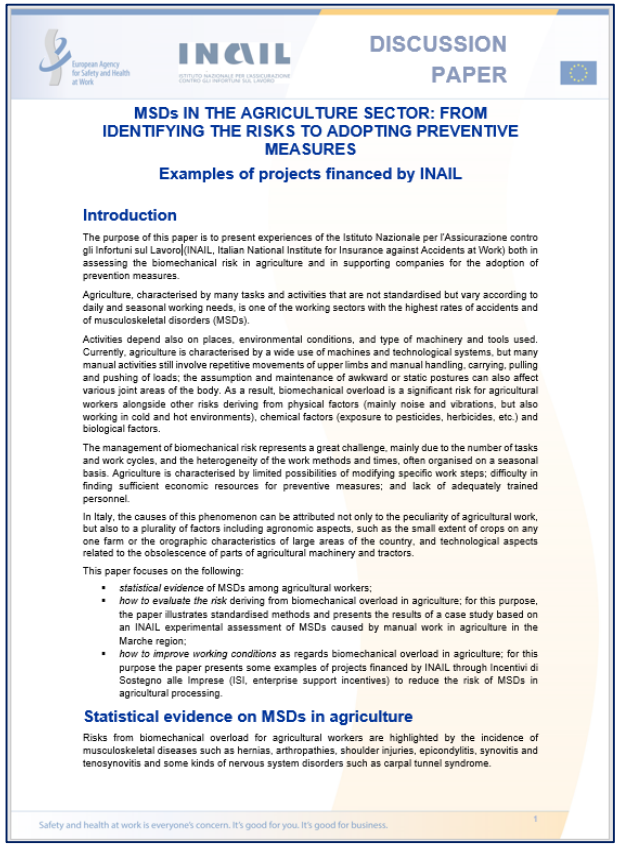
The cooperation agreement between EU-OSHA and Inail: the expert article on MSDs prevention in agriculture

What experiences can we share with a European panel?



DISCUSSION PAPER

MSDs IN THE AGRICULTURE SECTOR: FROM IDENTIFYING THE RISKS TO ADOPTING PREVENTIVE MEASURES

Examples of projects financed by INAIL

Introduction

The purpose of this paper is to present experiences of the Istituto Nazionale per l'Assicurazione contro gli Infortuni sul Lavoro (INAIL, Italian National Institute for Insurance against Accidents at Work) both in assessing the biomechanical risk in agriculture and in supporting companies for the adoption of prevention measures.

Agriculture, characterised by many tasks and activities that are not standardised but vary according to daily and seasonal working needs, is one of the working sectors with the highest rates of accidents and of musculoskeletal disorders (MSDs).

Activities depend also on places, environmental conditions, and type of machinery and tools used. Currently, agriculture is characterised by a wide use of machines and technological systems, but many manual activities still involve repetitive movements of upper limbs and manual handling, carrying, pulling and pushing of loads; the assumption and maintenance of awkward or static postures can also affect various joint areas of the body. As a result, biomechanical overload is a significant risk for agricultural workers alongside other risks deriving from physical factors (mainly noise and vibrations, but also working in cold and hot environments), chemical factors (exposure to pesticides, herbicides, etc.) and biological factors.

The management of biomechanical risk represents a great challenge, mainly due to the number of tasks and work cycles, and the heterogeneity of the work methods and times, often organised on a seasonal basis. Agriculture is characterised by limited possibilities of modifying specific work steps; difficulty in finding sufficient economic resources for preventive measures; and lack of adequately trained personnel.

In Italy, the causes of this phenomenon can be attributed not only to the peculiarity of agricultural work, but also to a plurality of factors including agronomic aspects, such as the small extent of crops on any one farm or the orographic characteristics of large areas of the country, and technological aspects related to the obsolescence of parts of agricultural machinery and tractors.

This paper focuses on the following:

- *statistical evidence* of MSDs among agricultural workers;
- *how to evaluate the risk* deriving from biomechanical overload in agriculture; for this purpose, the paper illustrates standardised methods and presents the results of a case study based on an INAIL experimental assessment of MSDs caused by manual work in agriculture in the Marche region;
- *how to improve working conditions* as regards biomechanical overload in agriculture; for this purpose the paper presents some examples of projects financed by INAIL through Incentivi di Sostegno alle Imprese (ISI, enterprise support incentives) to reduce the risk of MSDs in agricultural processing.

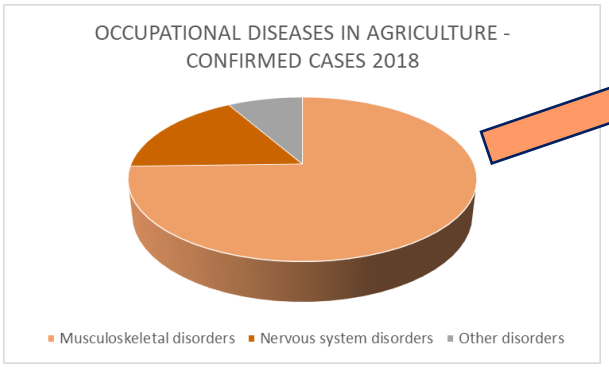
Statistical evidence on MSDs in agriculture

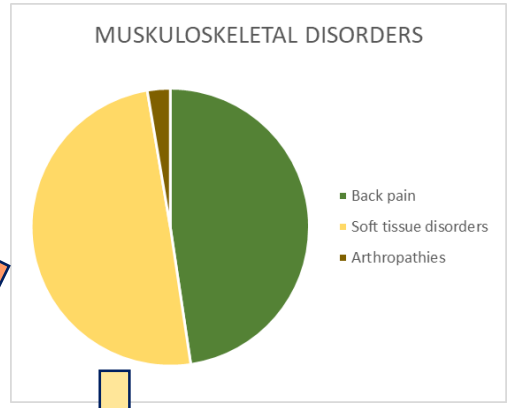
Risks from biomechanical overload for agricultural workers are highlighted by the incidence of musculoskeletal diseases such as hernias, arthropathies, shoulder injuries, epicondylitis, synovitis and tenosynovitis and some kinds of nervous system disorders such as carpal tunnel syndrome.

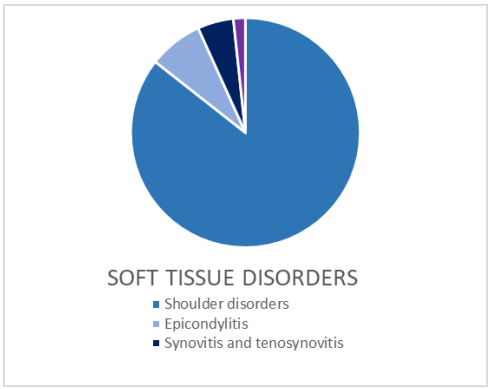
Safety and health at work is everyone's concern. It's good for you. It's good for business.

The first question:
what evidence of MSDs in agriculture do we have?

Italian data



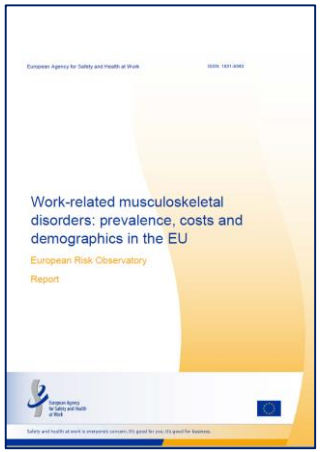




European data

69 % of agricultural workers reported having suffered back pain in 2015

56 % of agricultural workers reported pain in the upper limbs in the same period



EU-OSHA, 2019: Work-related musculoskeletal disorders: prevalence, costs and demographics in the EU
(results of the sixth wave of the European Working Conditions Survey)

A common item: the heterogenicity of farm work

The workplace

The seasonal working needs:

from soil preparation ….

…. to harvesting

The degree of mechanisation

……

The second question:
how can we assess the risk of MSDs in agriculture?

The **INAIL-Marche case study**: a 2-year study at the University farm to estimate the risk of biomechanical overload of the upper limbs in 4 types of growing:

Viticulture

Olive growing

Orchards

Strawberry cultivation

The study is representative of central Italy farms by crop type, cultivation methods and size and type of farm

The INAIL-Marche case study – some results

Dynamic frequency of action be very high (up to 60-70 actions per minute)

Workers may assume for significant time awkward postures with the arms above the shoulders …..

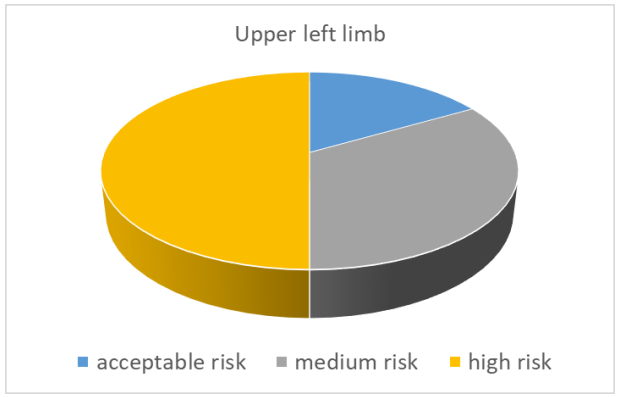
… and with hands in pinch posture

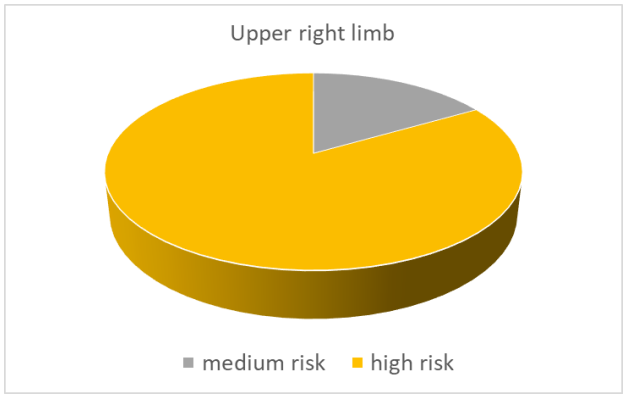
Some operations may require the application of significant force with both upper limbs

The INAIL-Marche case study – some results

The risk indices obtained through the application of **OCRA check list** confirm the effects of biomechanical overload on the **upper limbs** detected by the data on occupational diseases.

For example, workers may be exposed to **high levels of risk** when performing **olives growing** operations.





The third question: how can MSDs be reduced?

- **Organisational measures** such as the **shifting** of workers in the heaviest jobs and the adoption of adequate **breaks** during work

- **Training** on the correct ways of carrying out operations

- **Mechanisation** of manual operations

The INAIL incentive schemes

ISI = Italian funding scheme provided by INAIL for the implementation of projects aimed at improving health and safety at workplace.

www.inail.it

For micro and small farms:

- **non-repayable grants** up to 40 % of the project cost (50 % for young farmers) to a maximum of €60,000 for the purchase of agricultural machines or tractors that ensure the **reduction of occupational risks**.

The improvement can be achieved also by the **mechanisation of manual work.**

The INAIL incentive schemes for agriculture

Some examples of machines for the mechanisation of manual work

Olive tree shaker and harvester

Operations	
Harvesting by means of hand-carried mechanical aids for detaching olives, and manual catching	Mechanical harvesting and catching by means of self-propelled trunk shaker with wrap-around catching frame
Manual combs or mechanical harvesting aids such as hand-held vibrating combs or electric or pneumatic beaters and shakers make olives fall on the nets lying on the ground	The shaker moves forward, secures the trunk with clamps and opens the catching frame, a kind of upside-down umbrella wrapped around the tree. The shaking of the trunk causes the olives to fall on the catching frame and from there into a bin (which holds 150-200 kg)
The nets are moved and the crates filled (23-25 kg each) manually	The bin is lifted and the olives are loaded directly into a larger bin or in the trailer
The crates are carried to the trailer	

Risk factor	Increase	Reduction
Manual handling		
Lifting and carrying		with regard to crates
Handling of low loads at high frequency		with regard to rakes
Postures		
Body twist		with regard to handling manual or vibrating rakes
Long-lasting static postures with raised arms		with regard to handling vibrating rakes during harvesting from tall trees
Bent down postures		with regard to moving plastic tarpaulins and filling the crates
Hand posture: pinch		with regard to handling manual rakes
Hand posture: grip		with regard to handling vibrating rakes
Vibrations		
Hand-arm vibrations		with regard to electric/pneumatic harvester tools
Whole-body vibrations	with regard to driving and using tree shakers	

The INAIL incentive schemes for agriculture

More examples of machines for the mechanisation of manual work

Grape harvester

Reduction of the risks arising from:

- awkward postures
- repetitive movements
- manual lifting and carrying

Orchard platform

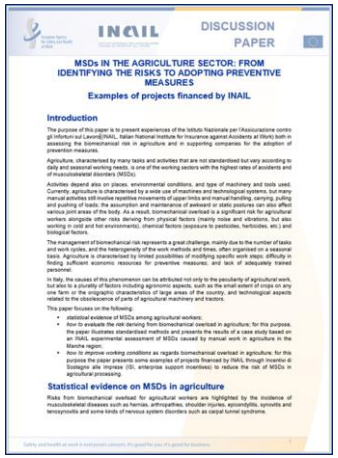
Reduction of the risks arising from:

- postures with raised arms
- manual lifting and carrying

In conclusion....

Agriculture is characterised by working conditions that expose workers to **biomechanical risk**.

- The adoption of a **common risk assessment methodology** by Member States could be the first step to compare similar situations and share experiences on effective solutions.
- **Mechanisation** is particularly important when growing techniques are still based mainly on manual work, as in the cultivation of olives, grapes, other fruit and vegetables; a careful risk assessment must be carried out to ensure the correct use of the machinery in safe conditions.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Thank you for your attention

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