

Rotterdam Conference 27-29 May 2016
14th EWHN conference

Infomeeting

Ergonomics: more than a technical viewpoint

Ergonomics and work related stress risk assessment and management

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The contribution of Ergonomics

What is Ergonomics?

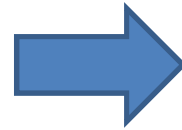
It is the **scientific discipline** concerned with the understanding of the **interactions** among **human** and **other elements of a system**, and the **profession** that applies theory, principles, data and methods to design in order to optimize human **well-being** and overall **system performance**

(International Ergonomics Association)

Ergonomics: a gradual deterioration

From this definition ...

- understanding of the **interactions** among **human** and **other elements of a system**
- design in order to optimize human **well-being** and overall **system performance**



... to only this (at 90%)



What went wrong?
Where's all the rest?

Keys for understanding the human activity

- The human at work:
 1. a **biological or physical** dimension: the human as «energy transformer»
 2. a **cognitive** dimension: the human as «information processing system»
 3. a **psycho-social** dimension: the human as «sense-making system» producing relationships, culture, identity, etc.



First level

Keys for understanding the human activity

• Antecedents of the activity

• Human activity



• Effects of the activity

Second level

Keys for understanding the human activity

Human-related antecedents

Organisation-related antecedents

• Human activity



Effects on the human element

Effects on the organisation

Third level

Keys for understanding the human activity

Gender, age, seniority,
experience, skills,
disabilities, state of health,
etc.

Technologies, organisation, tasks
to be accomplished, environment,
relationships, etc.

• Human activity



Negative effects (i.e. tiredness,
occupational illnesses, injuries,
stress) and positive effects
(improvement of skills, sense of
identity, of memership, etc.)

Positive or negative effects
(productivity, quality, safety,
other aspects in collective
performance)

Another key: Prescribed task vs. Real activity

Task

- It's required (explicitly or implicitly) by the company before the activity or provided to the operator
- It's defined by:
 - Task required
 - Criteria to comply with
 - Procedures
 - Condition in which the task will be realised

Real activity

- It's what the operator really does in the work situation
- It results from several factors, included:
 - What the operator understood about the task to be accomplished (complexity, cognitive resources of the operator)
 - Values, expectations and skills of the operator
 - What is available (resources)
 - Variability of the working conditions

Another key: Prescribed task vs. Real activity



**KEYS FOR UNDERSTANDING WORK-RELATED
STRESS WITH AN ERGONOMICS PERSPECTIVE
ON THE HUMAN ACTIVITY**

Do you
remember
this?

Keys for understanding the human activity

Human-related
antecedents

Organisation-related
antecedents

• Human activity



Effects on the
human element

Effects on the
organisation

When it comes to stress...

Human-related antecedents (copying, internal resources, etc.)

Organisation-related antecedents (organisational context, job content, resources available, etc.)

- 
- Psysical, mental, organisational activity

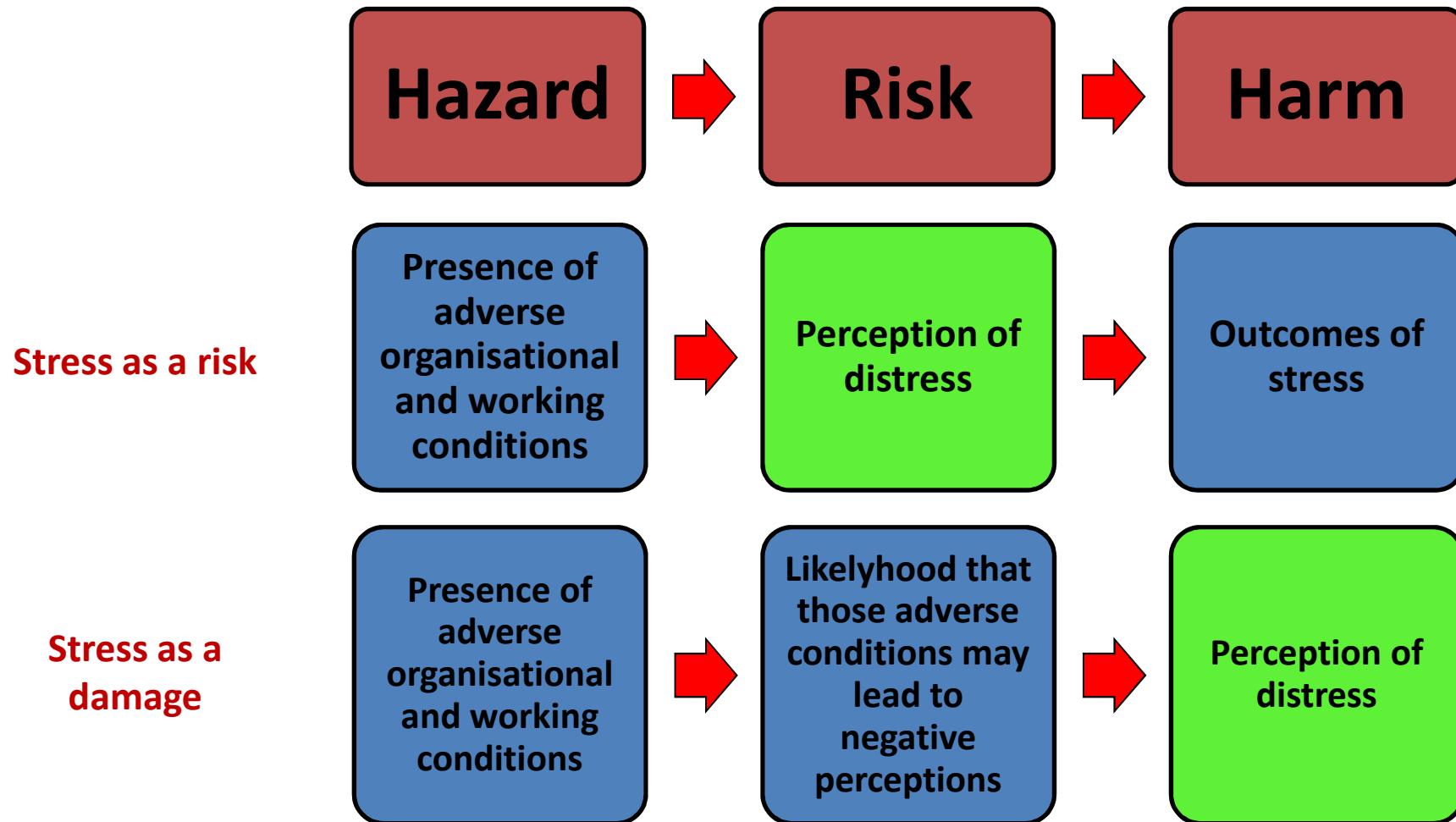
Effects on the human element (among which: stress, wellbeing and their impacts)

Effects on the organisation (among which: performance, quality, injuries and errors rates, absences for ill-health, etc.)

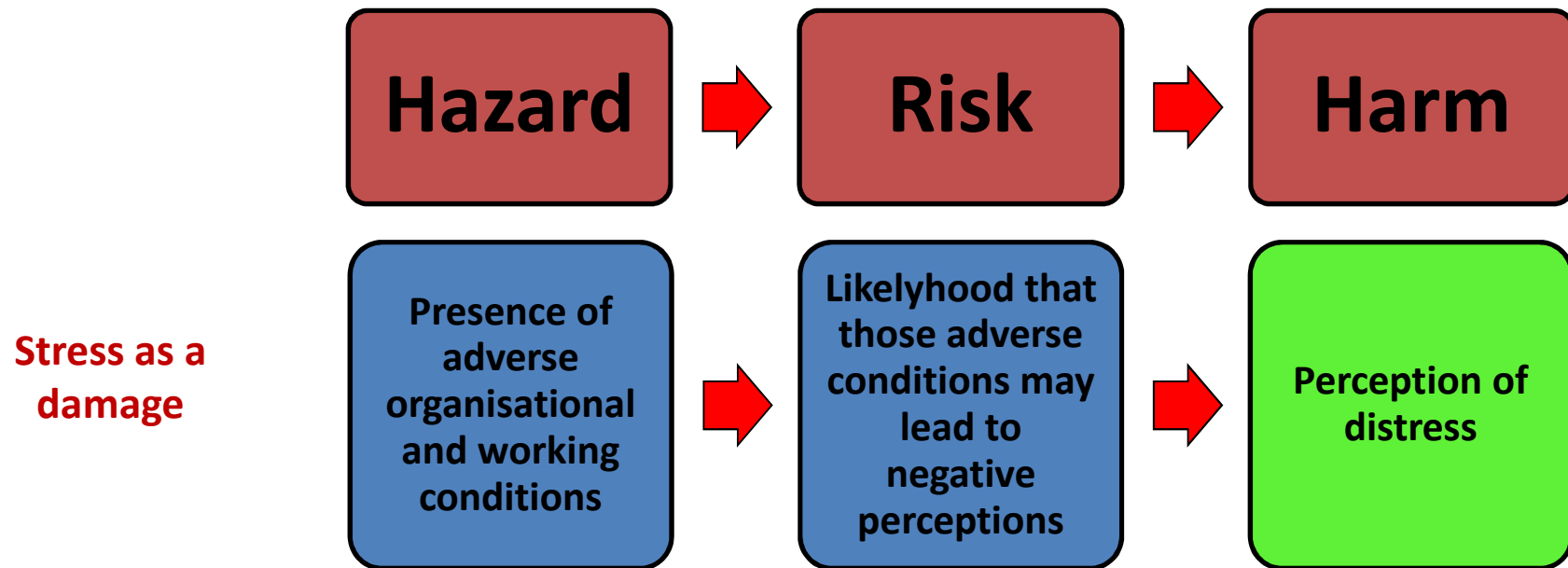
Some possible improvements in nowadays practices in the field of work related stress

- Risk assessment is **very often based only on subjective perceptions** of risk
- An **objective assessment is often considered weak** but in fact **a true consideration of it is missing** in the good practices and in the scientific debate, there are mainly superficial and questionable practices and check lists
- **Ergonomics is almost totally excluded** by all interventions in risk assessment and risk reduction
- **Ergonomics** is only used as a tool for some improvements in the workplaces; in fact ergonomics **is almost absent in the debate** about work related stress risk assessment

Two complementary points of view about work-related stress risk



Two complementary points of view about work-related stress risk



Definition of Psychosocial risk: “Those aspects of work design, and the organisation and management of work, and their social and organisational contexts, which have the potential for causing psychological or physical harm”

(Cox et al., in Clarke e Cooper, 2004, pag. 3).

**Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity
(WHO)**

Case history: a multinational company

- German **multinational company, present in Italy** in the field of hydraulics, electronic control technology, solenoid technology and other
- About **90 employees** (salepersons, warehousemen, administration; there's not production in Italy)
- In **2011 a first work-related stress risk assessment** was performed (using objective and subjective methods)
- In **2014** it was updated with a **new analysis**

Analysis of the organisation and of the job conditions



17 different homogeneous groups
(same activity = same group)

Job-related factors

6 different factors, for each
homogeneous group of workers

Factors in the organisational context

12 factors, shared by all the
homogeneous groups of workers

1 company

A benchmarking-based method

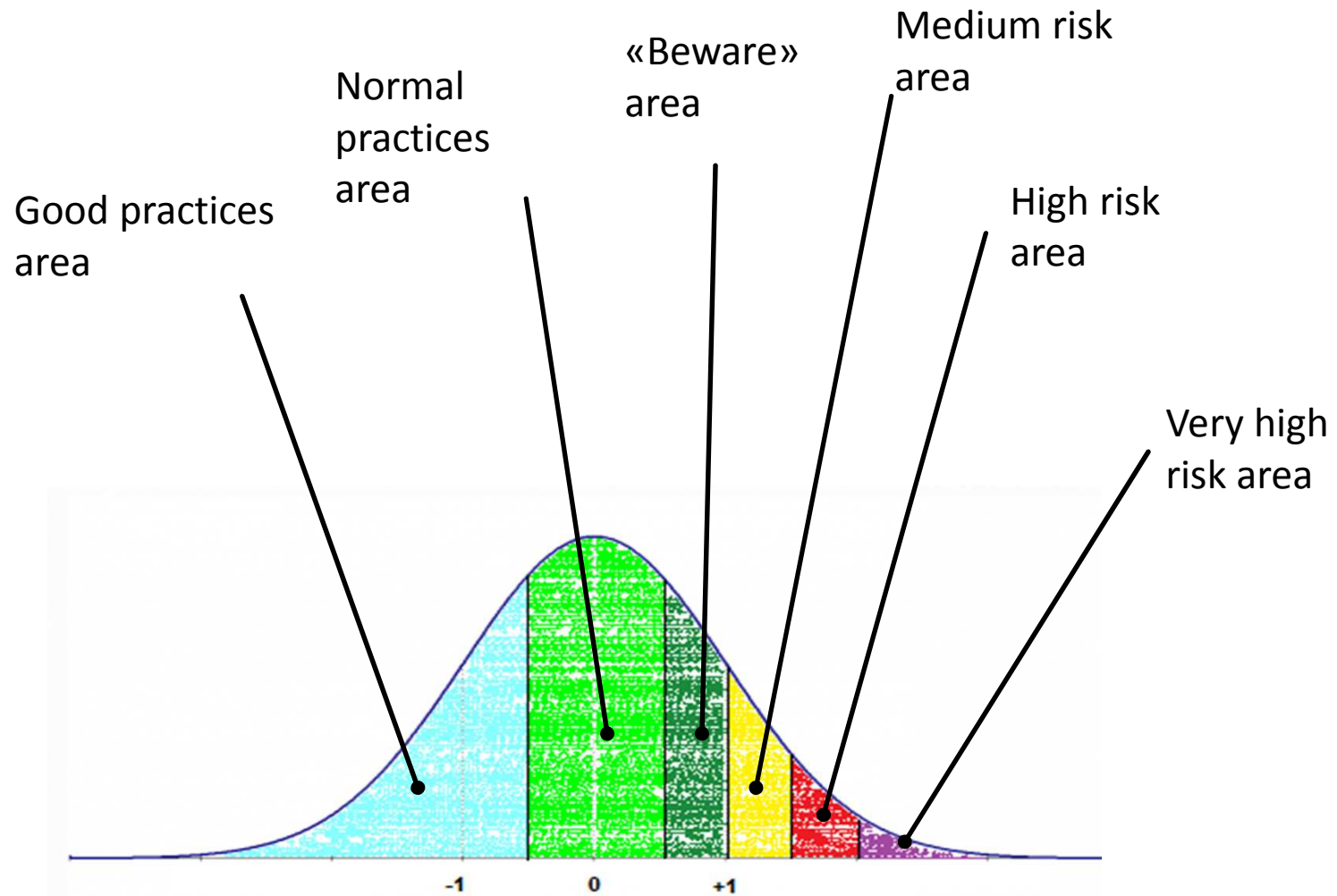
- The assessment of the working conditions is easier and more effective comparing each group with a sample of other companies used as a benchmark
- The sample as a benchmark:
 - 53 sites of about 30 companies, 580 homogeneous groups (activities)
 - Italian companies (mainly in the North of Italy)
 - various business sectors (chemical, engineering and telecoms, glass, food, tourism, retail, energy, garbage collection, goldsmith, mechanical, commerce, printing, etc.)
 - sized from a few employees up to 6000 employees; mainly medium and large companies
- Interventions were conducted in the period 2009-2014

Objective or subjective data

- The difference between objective or subjective data has to be discussed
- In every organisational or ergonomic analysis data can be collected:
 - ✓ in the most descriptive and objective possible way
 - ✓ with the participation of several players (from management to workers)
 - ✓ with the support and the method brought by an expert

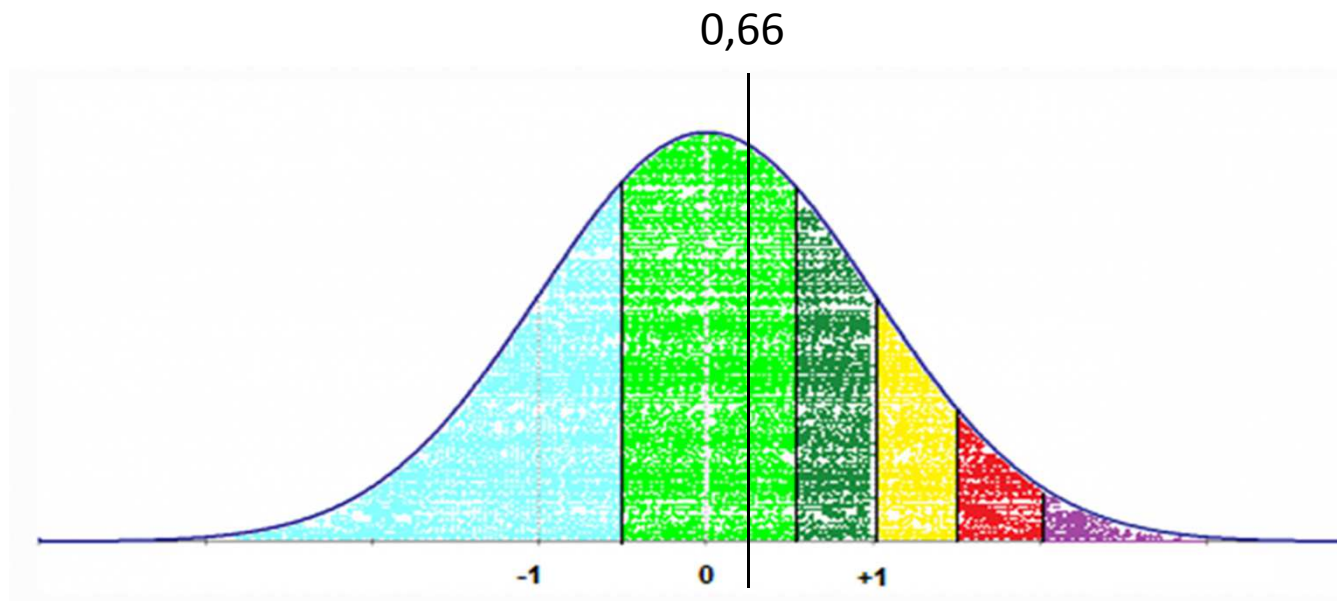
- The analysis is based on the description made by well informed persons as witnesses (involved in the analysis through structured interviews)
- Data and indexes obtained are compared against the benchmarking sample previously analysed

Comparing against a benchmark



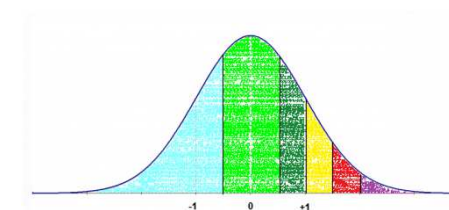
Example: an organisational factor

- **Quality of the training processes in the organisation**



Exposure levels to organisational factors

12 organisational factors	Exposure level
Organisational structure	Green
Organisational culture	Yellow
Decision processes / Participation	Red
Internal communication	Yellow
Training	Green
Development, career opportunities	Light Green
Autonomy in decisions, control	Light Green
Interpersonal relationships	Red
Work-family relationship	Light Blue
Change management	Light Green
Appraisal	Yellow
Task design	Light Green

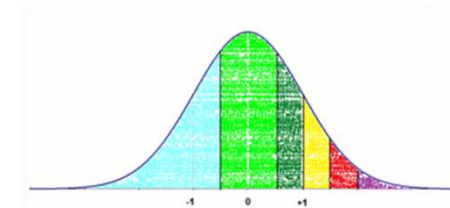


Exposure levels to job-related factors

6 Job-related factors	Exposure levels
Job place and environment	Light blue
Organisation of the workstation	Dark purple
Methods for performing the task	Bright green
Use of tools and equipments	Bright green
Mental charge	Light blue
Organisational and social aspects (specifically task-related)	Light blue

Job-related factors for the homogeneous group:

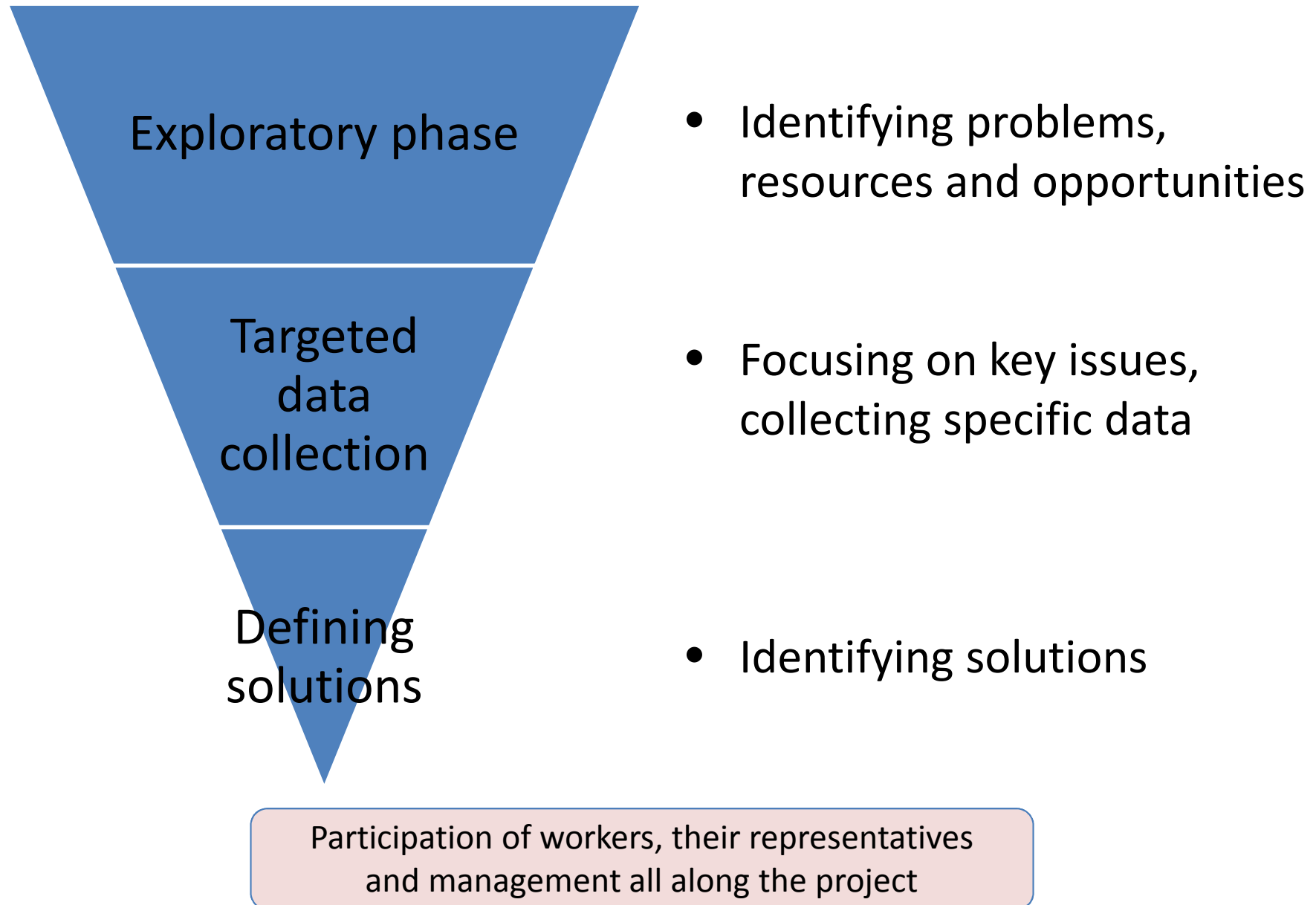
- **Goods reception (warehouse)**



How to improve the situation?

- The work-related stress risk assessment pointed out opportunities for improvements in working conditions for the warehouse activities
- It was decided to implement a project aimed at identifying improvement actions the critical issues noted
- The objectives of the project were:
 - ✓ an improvement of the health and risk reduction stress;
 - ✓ a performance improvement (reduction of errors, quality improvement)
- The project saw a strong participation of the workforce
- About 20 improvement actions were defined

Phases of the project



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THANK YOU