

**10th European ALARA Network Workshop**  
**Experience and new developments in implementing ALARA**  
**In occupational, public and patient exposures**  
**12 - 15 September 2006, Prague**



**Putting radiation exposure in perspective with  
other occupational risk factors**

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## Occupational Risk Factors

- **Chemical risk factors: 100,000**  
**(Carcinogens:400)**
- **Physical factors: 50**
- **Biological agents: 200**
- **Adverse ergonomic conditions: 20**
- **Allergens: 3000**

# Hazardous Work Physical Hazards

- Noise over 85 dB(A)
- Vibration
- High pressures (air, water)
- Ionizing radiation
- Heat radiation, UV radiation, extreme temperature (e.g. sunstroke, frostbite)
- Continuous weight lifting (more than 20 kg for males, 15 kg for females)
- Where risk of repetitive strain injuries exist
- Dealing with electric voltage or close to open live wires, climbing electric poles, electricity service work

# Hazardous Work & Biological Hazards

- Bacteria and viruses, risk of contamination
- toxic, infectious or allergenic biological agents and waste
- contact with wild or poisonous animals & transmissible animal diseases
- Slaughterhouses, carcasses
- Sewage system and toilet draining and cleaning

# Hazardous Work

## Other Hazards

- Mining and underground work
- Loading and unloading ships
- Driving railway cars, coupling of railway cars
- Hazardous installations and service work
- Service and repair of pressure vessels
- Excavations or other collapsing structures
- Demolition work
- Work in closed containers
- Work where falling from high may occur

# Hazardous Work

## Other Hazards

- Work with dangerous animals, and test animals
- Manufacture of explosives, fireworks
- Pressurized or liquefied gases, acetylene welding bottles
- Containers that carry hazardous chemicals
- Machine driven, conveyor work when linked to a piece rate salary

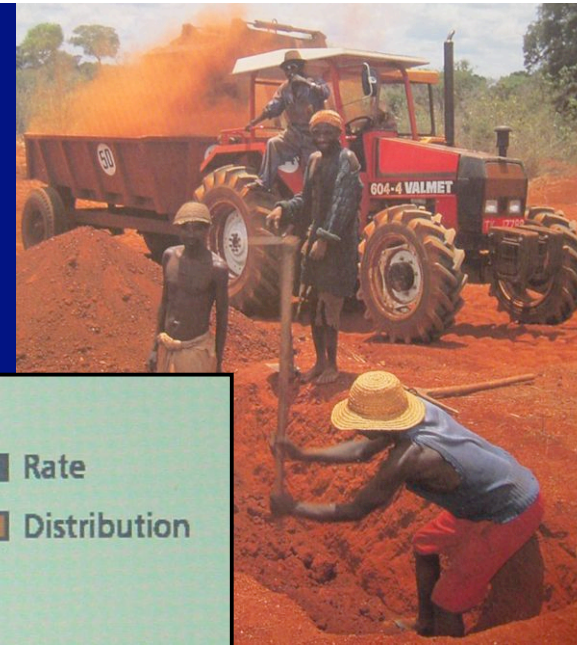
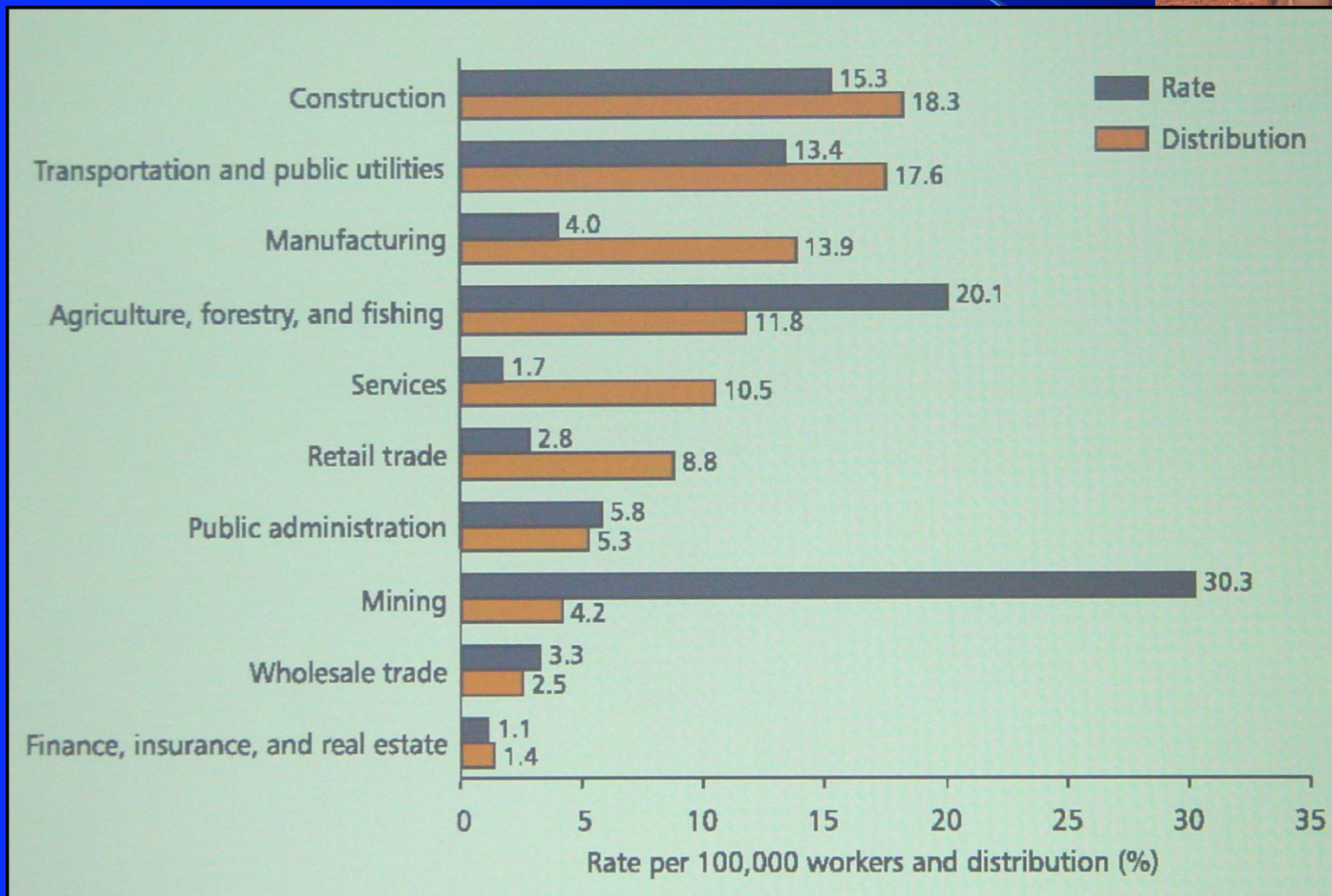
# Hazardous occupations

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- Fatal logging injuries in mountain areas of North-Carolina 3420/ 100,000
- Commercial fishermen 155 / 100,000
- Timber cutters 133
- Airplane pilots 76
- Taxi drivers 50
- Electrical installers 38
- Farm operators 36
- Construction laborers 33
- Office worker 0.5



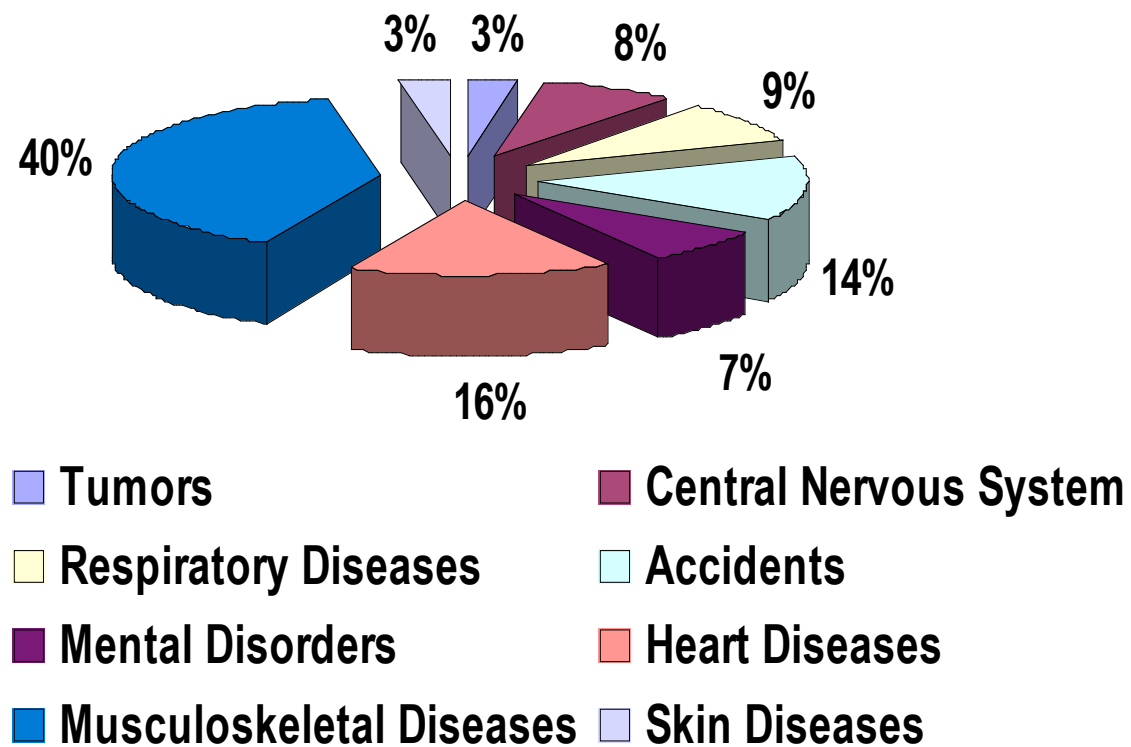
**Average annual rate and distribution (%) of fatal occupational injuries by industry division, 1980-1995,**  
source: NIOSH/USA





# Costs of work-related injuries and diseases

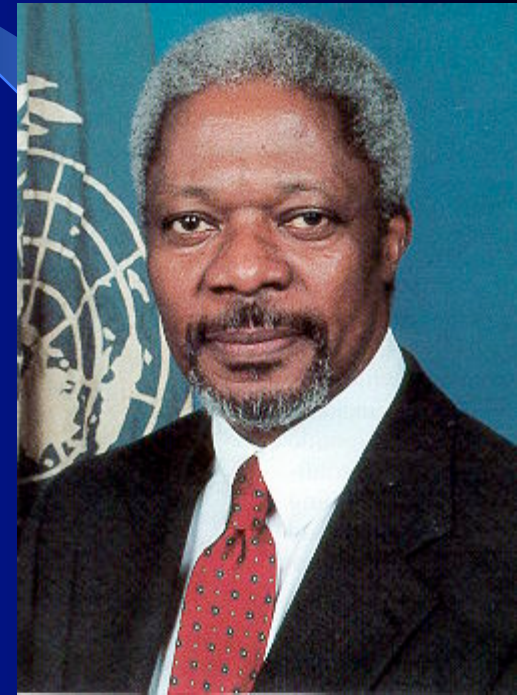
## Costs by disease or injury



# Occupational injuries and diseases

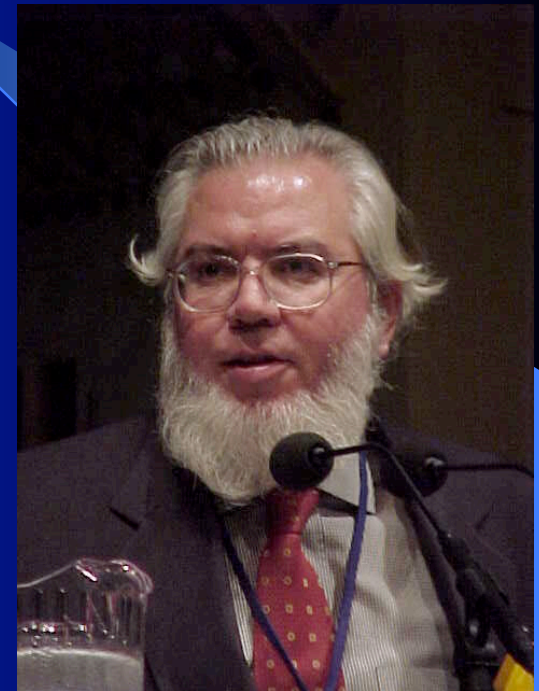
- 335,000 deaths
- 250 million accidents
- 160 million occupational diseases
- 4% of world's gross national product is lost

Source: Kofi A. Annan. Occupational health and safety: a high priority on the global, international and national agenda. Asian-Pacific Newslett on OSH 1997;4:59

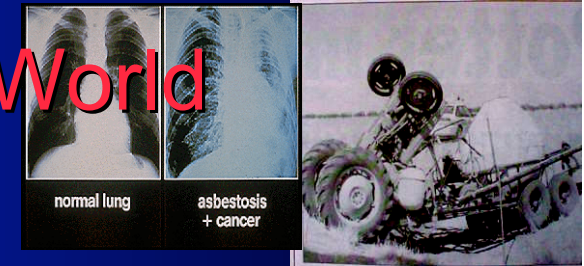


# Deaths, Disabilities and Diseases

ILO Estimate of work  
related deaths in 2000:  
**1.9 –2.3 Million**



# Work-related Annual Deaths - World



- Economically active population: 2.7 billion

● <b><i>Deaths attributed to occupation</i></b>	<b>1.9 - 2.3 Million</b>
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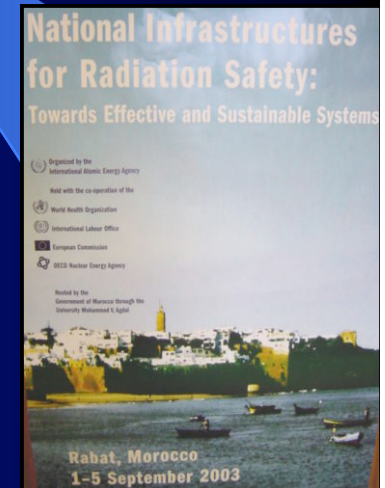
- |   |                    |
|---|--------------------|
| ● <b>Work-related diseases:(lower limit)</b>              | <b>1.6 Million</b> |
| - communicable diseases, w/r                              | 320 000            |
| - cancer, w/r   | 610 000            |
| - circulatory diseases, w/r                               | 449 000            |
| - chronic respiratory diseases<br>(silicosis 36 000), w/r | 145 000            |
| - nervous system disorders, w/r                           | 20 000             |
| - digestive system diseases, w/r                          | 21 000             |
| - genito-urinary disorders, w/r                           | 9 000              |

● <b>Deaths caused by work accidents</b>	<b>355 000</b>
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- **Commuting injuries**  
(not included in overall deaths above) **158 000**

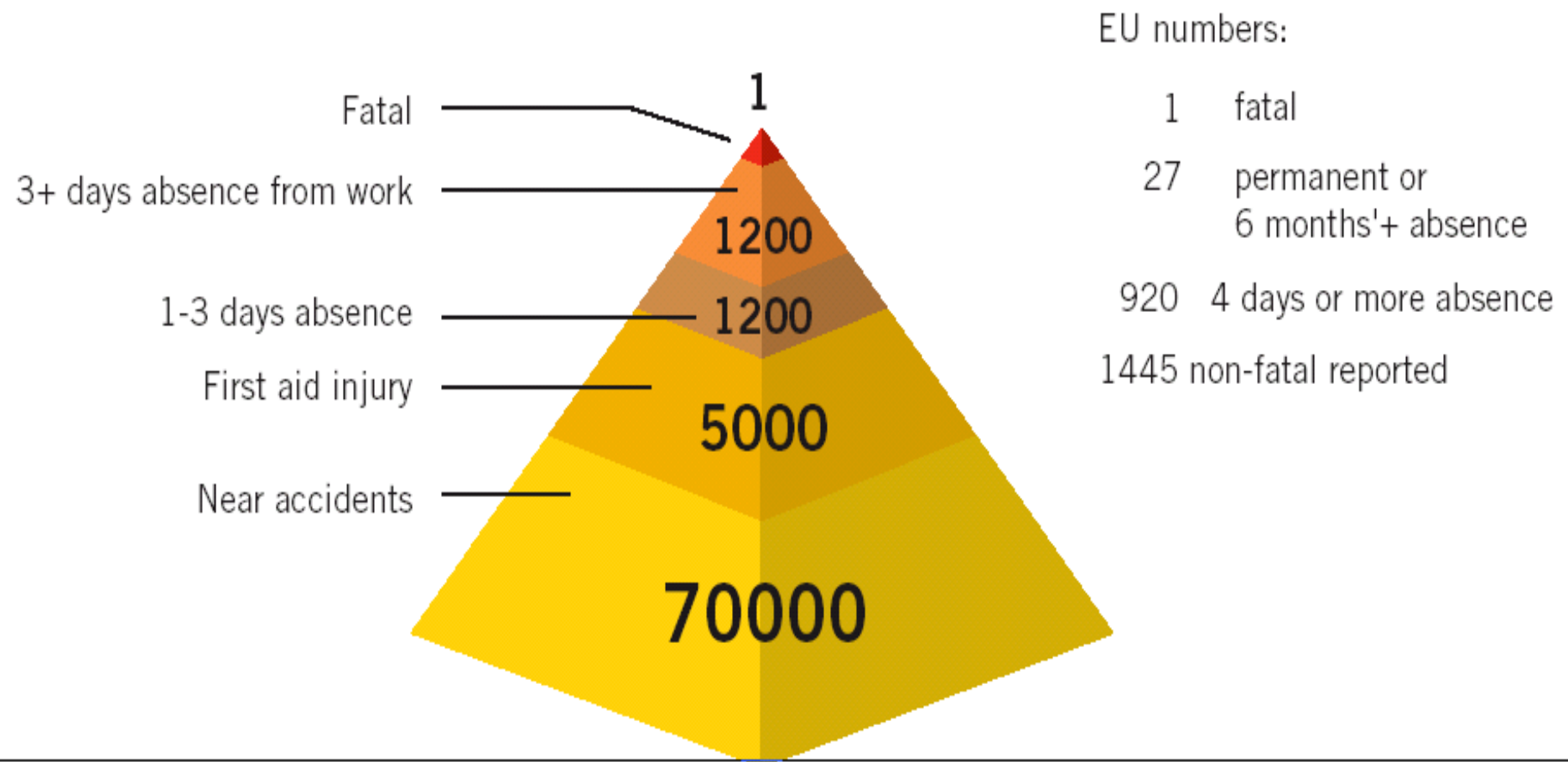
# Work-related effects of radiation

- Cancer of pancreas, attributable fractions: men 0.8%, women 1.9%
- Lung cancer caused by radon and combined effects: men 4.5 %, women 1.2%
- Bone cancer : 0.6/0.6 %
- Skin melanoma, airline pilots 0.1/0.1%
- Female breast cancer, 1.7%
- Skin non-melanoma, ultraviolet radiation, men 13.1%, women 3.8%
- Leukaemia, low-frequency magnetic fields, men 17.8%, women 2.3%



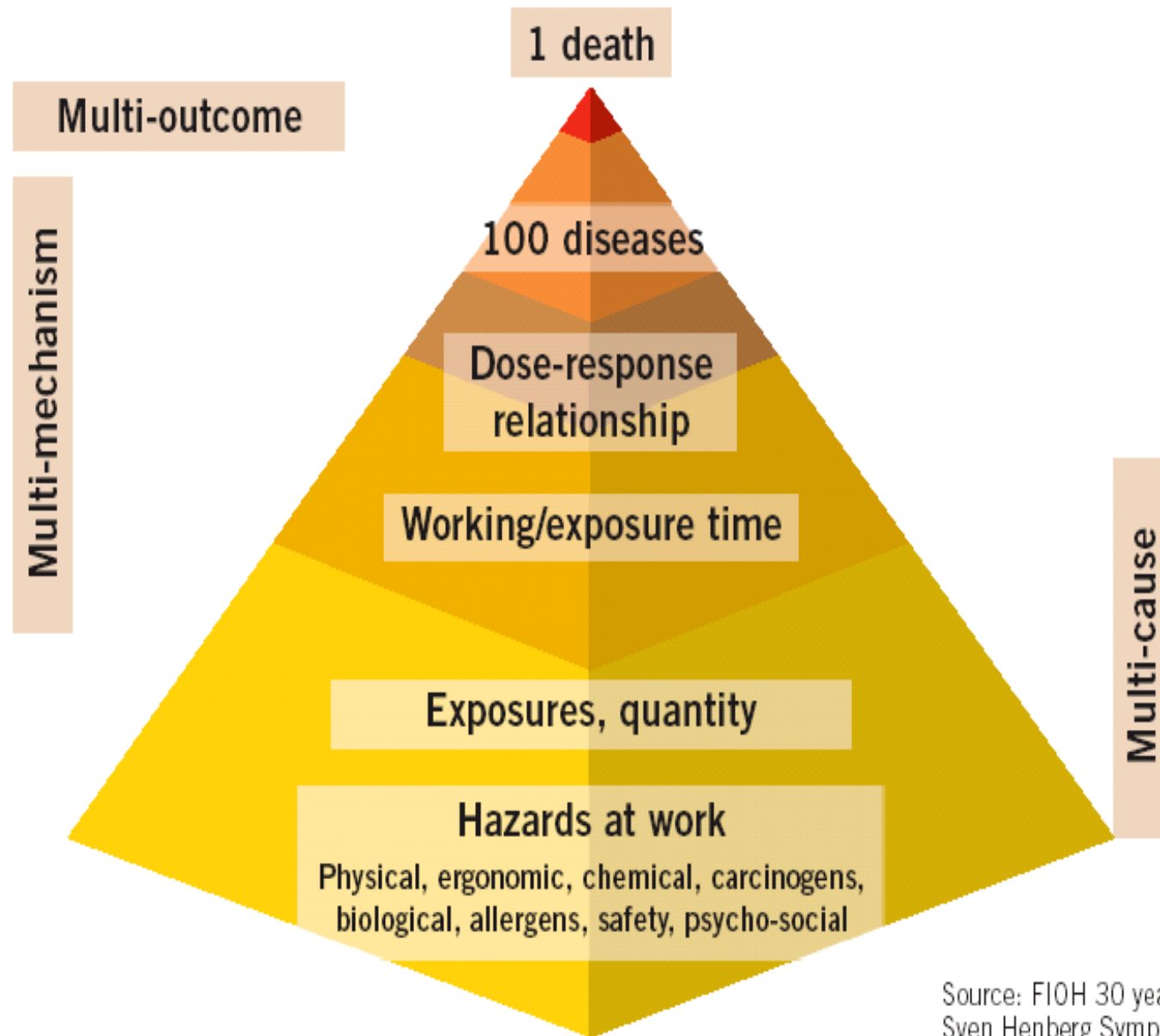
## Introductory Report: Decent Work - Safe Work

### The relation of fatal accidents, other accidents and incidents





## Links between hazards, exposures and work-related negative outcomes/diseases

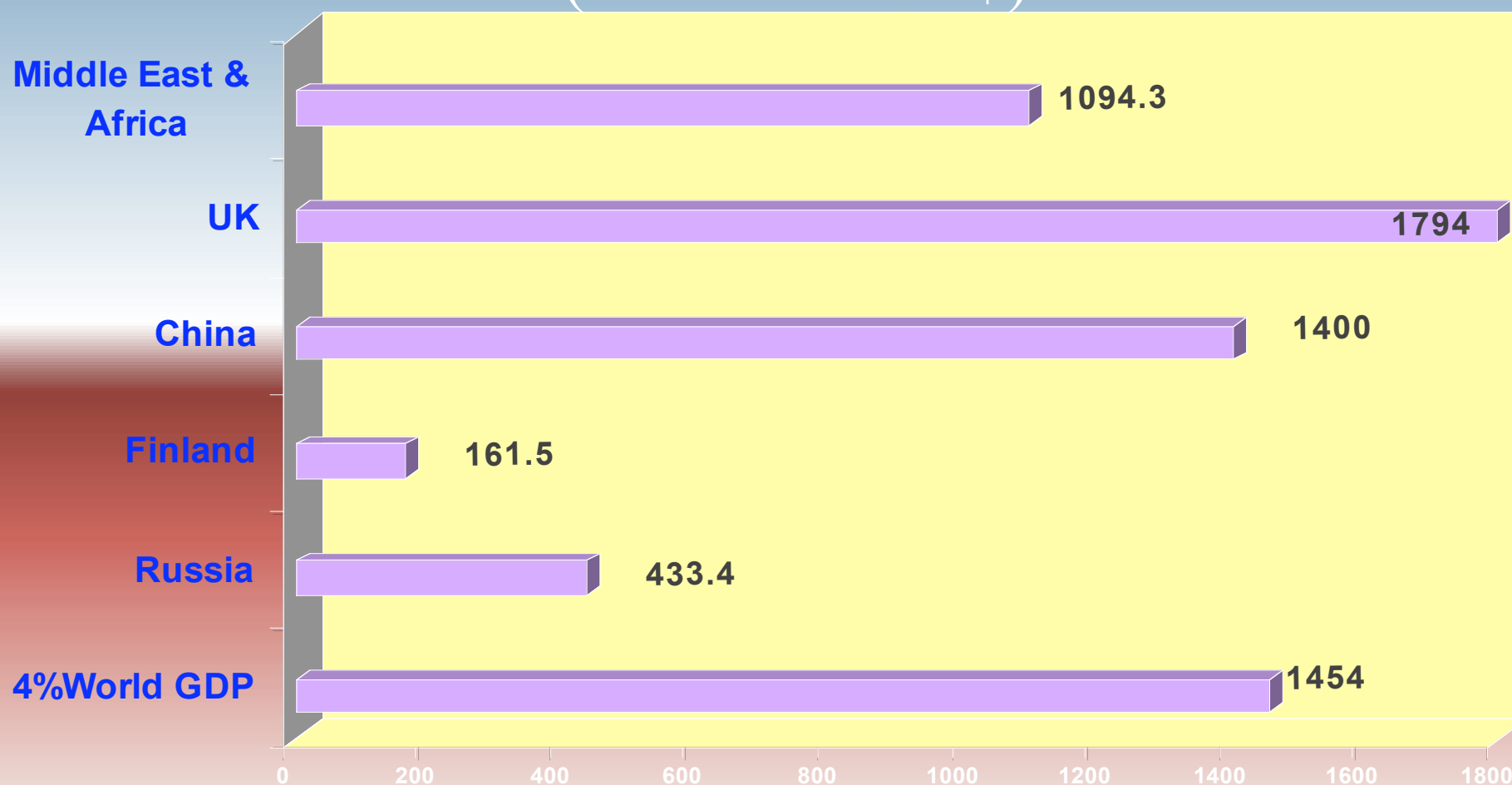


Source: FIOH 30 years of Epidemiology  
Sven Henberg Symposium, ILO/SafeWork

## Magnitude of Safety and Health Problems at Work

**ILO estimates that 4% of the world Gross Domestic Product is lost due to accidents and work-related diseases.**

# Global Economic Losses and GDPs of Selected Countries ( in billion US\$)



World GDP: 36356 billion US Dollars in 2003

# International Labour Organization

- The ILO is a tripartite organization with worker and employer representatives taking part in its work on equal status with those of governments.
- The number of the ILO member countries now stands at 179.
- In 1969 the ILO was awarded the Nobel Peace Prize

## International Labour Organization

- **Standard-setting** is one of the ILO's major means of action to improve conditions of life and work worldwide.
- ILO standards are **Conventions** and **Recommendations** adopted by the International Labour Conference.



# International Labour Conference

- Between 1919 and 2006, 187 Conventions and 198 Recommendations were adopted.
- Many of these instruments relate to occupational safety and health.





## International Labour Organization

**In June 1960, the International Labour Conference adopted Convention (No. 115) and Recommendation (No. 114) concerning the protection of workers against ionizing radiations.**

## International Labour Organization

- The C. 115 applies to **all activities** involving **exposure** of workers to ionizing radiations **in the course of their work** and provides that each Member of the ILO who ratifies it shall give effect to its provisions by means of laws or regulations, codes of practice or other appropriate methods.

Convention No. **C115** was ratified by **47** countries.

Country	Ratification date
<a href="#">Argentina</a>	15:06:1978
<a href="#">Azerbaijan</a>	19:05:1992
<a href="#">Barbados</a>	08:05:1967
<a href="#">Belarus</a>	26:02:1968
<a href="#">Belgium</a>	02:07:1965
<a href="#">Belize</a>	15:12:1983
<a href="#">Brazil</a>	05:09:1966
<a href="#">Chile</a>	14:10:1994
<a href="#">Czech Republic</a>	01:01:1993
<a href="#">Denmark</a>	07:02:1974
<a href="#">Djibouti</a>	03:08:1978
<a href="#">Ecuador</a>	09:03:1970
<a href="#">Egypt</a>	18:03:1964
<a href="#">Finland</a>	16:10:1978
<a href="#">France</a>	18:11:1971
<a href="#">Germany</a>	26:09:1973
<a href="#">Ghana</a>	07:11:1961
<a href="#">Greece</a>	04:06:1982
<a href="#">Guinea</a>	12:12:1966
<a href="#">Guyana</a>	08:06:1966
<a href="#">Hungary</a>	08:06:1968
<a href="#">India</a>	17:11:1975
<a href="#">Iraq</a>	26:10:1962

<a href="#">Italy</a>	05:05:1971
<a href="#">Japan</a>	31:07:1973
<a href="#">Kyrgyzstan</a>	31:03:1992
<a href="#">Latvia</a>	08:03:1993
<a href="#">Lebanon</a>	06:12:1977
<a href="#">Mexico</a>	19:10:1983
<a href="#">Netherlands</a>	29:11:1966
<a href="#">Nicaragua</a>	01:10:1981
<a href="#">Norway</a>	17:06:1961
<a href="#">Paraguay</a>	10:07:1967
<a href="#">Poland</a>	23:12:1964
<a href="#">Portugal</a>	17:03:1994
<a href="#">Russian Federation</a>	22:09:1967
<a href="#">Slovakia</a>	01:01:1993
<a href="#">Spain</a>	17:07:1962
<a href="#">Sri Lanka</a>	18:06:1986
<a href="#">Sweden</a>	12:04:1961
<a href="#">Switzerland</a>	29:05:1963
<a href="#">Syrian Arab Republic</a>	15:01:1964
<a href="#">Tajikistan</a>	26:11:1993
<a href="#">Turkey</a>	15:11:1968
<a href="#">Ukraine</a>	19:06:1968
<a href="#">United Kingdom</a>	09:03:1962
<a href="#">Uruguay</a>	22:09:1992

## International Labour Organization

The C. 115 and R.114 lay down **basic principles** and establish a **fundamental framework** for radiation protection of workers. They also contain provisions which concern the **protective measures** to be taken, the **monitoring** of radiation and the **medical supervision** of workers.

## Other ILO Conventions and Recommendations Relevant to the Radiation Protection of Workers

Occupational Cancer Convention No. 139 and Recommendation No. 147, 1974.

Working Environment (air pollution, noise and vibration) Convention No. 148 and Recommendation No. 156, 1977.

**Employment Injury Benefit Convention No. 121, 1964.**

**The List of Occupational Diseases Recommendation No. 194, 2002.**

## Codes of Practice & Guidelines

ILO also provides **practical guidance** in the form of codes of practice or guidelines. They are used as reference work by anyone in charge of formulating detailed regulations or framing occupational safety and health programmes.



## **ILO Policy on the Improvement of Working Conditions and Environment**

- Work should take place in a safe and healthy working environment;
- Conditions of work should be consistent with workers' well-being and human dignity;
- Work should offer real possibilities for personal achievement, self-fulfilment and service to society.

## **Basic Principles in Occupational Safety and Health**

- **Responsibilities of the employer** towards the health and safety of the workers in his/her employment;
- **Role of the competent authority:** national policy, regulation, inspection, enforcement;

## Basic Principles in Occupational Safety and Health

- **Basic workers' rights:** right to know, to participate, to stop work in case of imminent danger, etc.

# Basic Principles in Occupational Safety and Health

## **Hierarchy of preventive measures(C.148,1977):**

- technical measures,
- organizational measures,
- personal protective equipment;

## **And more recently (C. 176, 1995 Article 6):**

- elimination of risks,
- control measures, minimization of risks,
- personal protection equipment;

## Objectives of ILO OSHE Programmes

- Reducing the number and seriousness of occupational accidents and diseases;
- Adapting the working environment, equipment and work process to the physical and mental capacity of the worker;

## Objectives of ILO OSHE Programmes

- Enhancing the physical, mental and social well-being of workers in all occupations; and
- Encouraging national policies and programmes of member States and supplying appropriate assistance.



# The development of OSH-MS

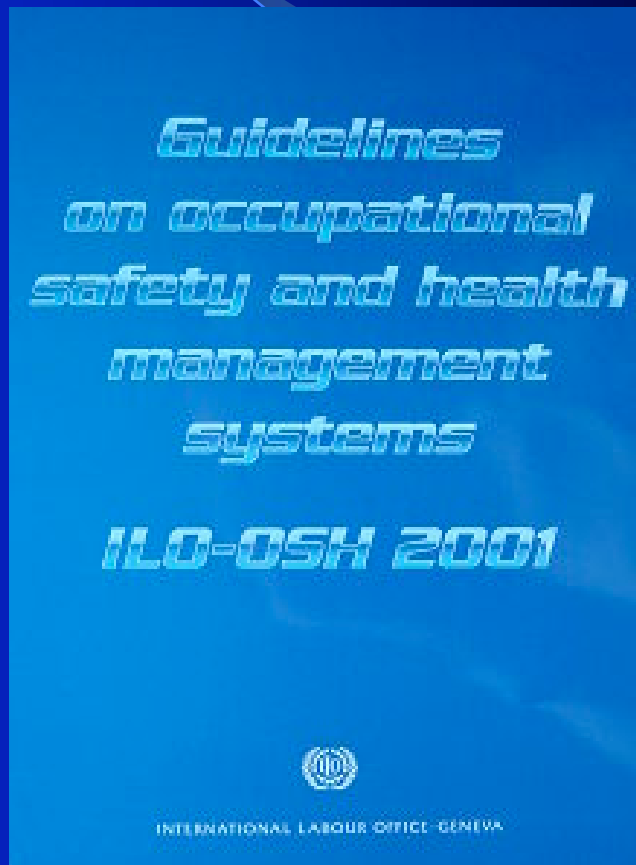
- Liberalisation of trade and economies
- Increase in occ. accidents and diseases
- Traditional command-control mechanisms inadequate
- « Systems » approach
- Development of standards by ISO during early 90s (9000 series on quality management & 14000 series on environmental management)

# Why OSH-MS?

- Systematic way to manage OSH activities in the organisation
- OSH as an integral part of the organisations's value system
- Reduction of hazards and risks, accidents and diseases
- Low absenteeism, higher productivity, greater job satisfaction

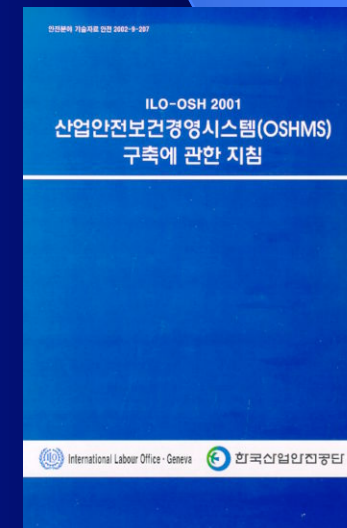
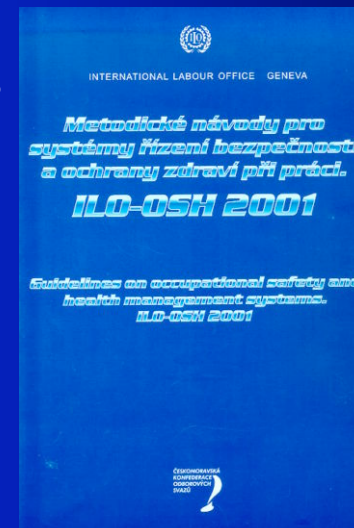
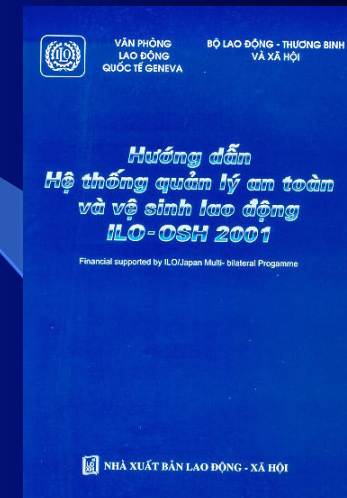
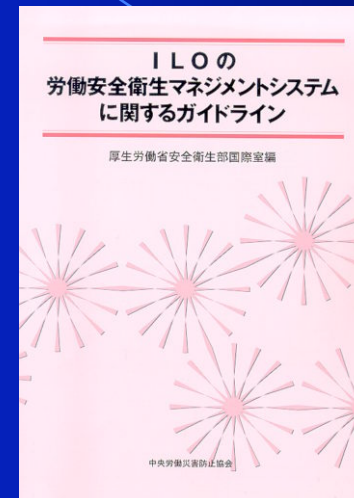
# ILO response

- ISO International Workshop 1996
- ILO tripartite experts meeting April 2001
- ILO-OSH 2001
- Compatible with other OSH-MS standards
- Action on 2 levels:
  - National level
  - Organisation level



# ILO-OSH 2001 – Translations

- Published in Arabic, Bulgarian, Czech, Chinese, English, Finnish, French, Japanese, Korean, Polish, Russian, Spanish, Thai, Vietnamese
- Translated into Hindi, Hebrew, German, Malay and Portuguese

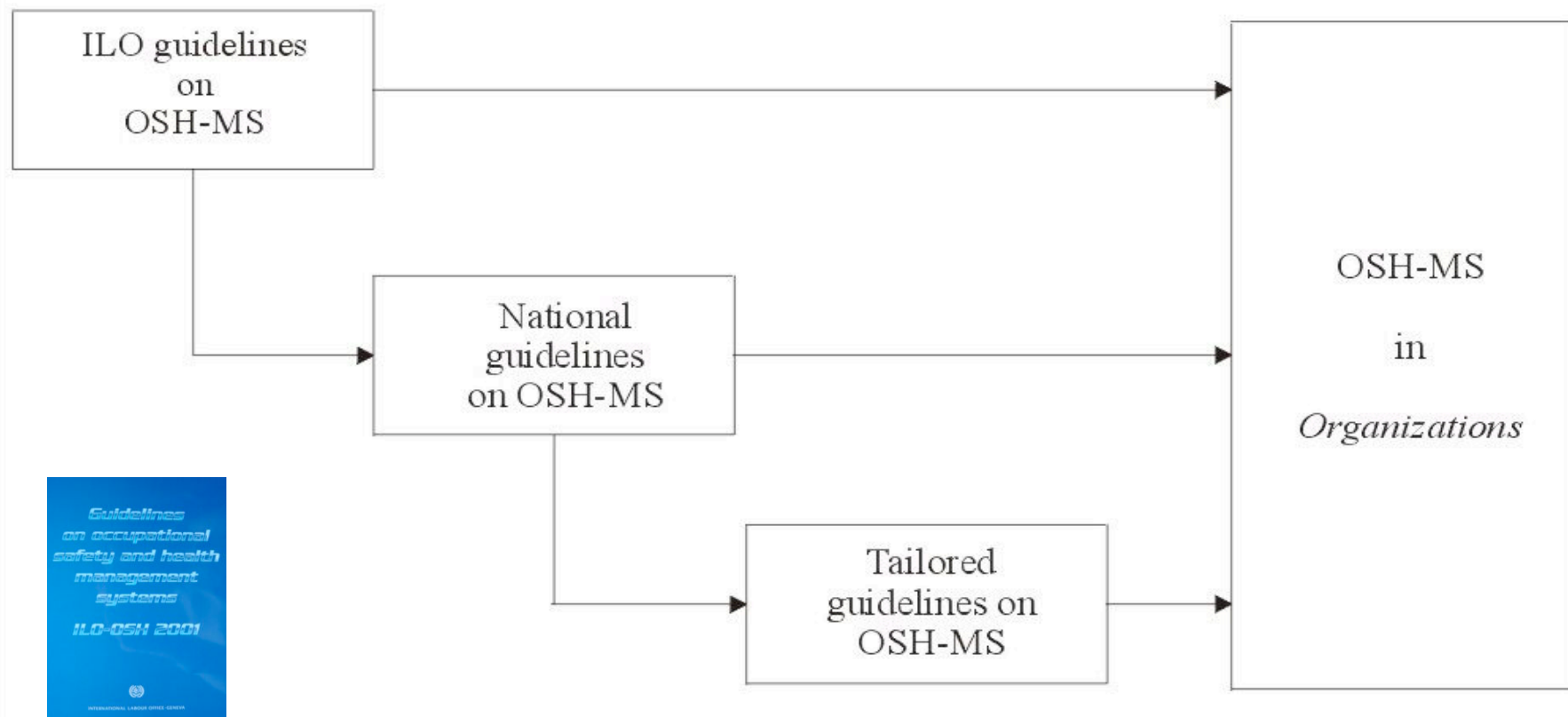


# National OSH-MS Framework

- Formulation of a national policy on OSH-MS
- Development of national guidelines (based on ILO-OSH 2001)
- Formulation of tailored guidelines, reflecting the specific conditions and needs of organisations

# Elements of the national framework

## Elements of the national framework for OSH management systems



Source: Guidelines on occupational safety and health management systems (ILO/OSH 2001) (Geneva, 2001)

# OSH-MS in the organisation

- Main elements
  - Policy
  - Organising
  - Planning and implementation
  - Evaluation
  - Action for improvement







International  
Labour  
Office

# GLOBAL STRATEGY ON OCCUPATIONAL SAFETY AND HEALTH

Conclusions adopted  
by the International Labour Conference  
at its 91<sup>st</sup> Session, 2003

# Major Challenges

- **Increases general awareness on OSH**
- **Effective national OSH system**
- **High level political commitment**
- **Priority to be given to OSH at international, national and enterprise levels**

# Fundamentals for Global Strategy

- Building and maintenance of Safety Culture
- Integrated approach to OSH
- Concept of OSH Management Systems
- Active participation of
  - *Government*
  - *Employers*
  - *Workers*

## **Global Strategy and Action Plan**

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- **Building and maintenance of a preventative safety and health culture**
  - right to safe and healthy work environment
  - principle of prevention
  - a systems approach
- 
- **Toolbox**
    1. Promotion, awareness raising and advocacy
    2. ILO instruments: standards, codes, guides
    3. Technical assistance and cooperation
    4. Knowledge development, management and dissemination
    5. International Collaboration



# Strategic Approach for Strengthening of National OSH Systems through National Programme

## National OSH Programme

- Promote Safety Culture
- Strengthen OSH System
- Targeted action:  
Construction, SME's, Agriculture etc.

## OCCUPATIONAL SAFETY & HEALTH SYSTEM

PROMOTION  
ADVOCACY

LEGISLATION

INSPECTION

KNOWLEDGE,  
SUPPORT  
SERVICES

ILO Conventions/Recommendations/Codes/Guides  
should be used as the basis for  
programme formulation and System improvements

NATIONAL TRIPARTITE ADVISORY BODY

# International Action Plan on ORP

## – ACTION PLAN ON ORP

- Action 12 : Promotion of a holistic approach to workplace safety
- Interagency Cooperation (IAEA/ILO/WHO/???)
- Involvement of stakeholders
- Output: International guidelines jointly published by IAEA/ILO/???



## International Action Plan on ORP

- Status of Action 12
  - Steering Committee Meeting January 2006
    - Need to review the background of the action
  - Working document produced
  - Meeting ILO-IAEA on 21 August 2006
  - Terms of reference fixed
- Next steps
  - Identification of experts ( RR and Non RR)
  - Consultancy meeting → draft guidelines
  - Production of the final version



Thank you!

