



International Commission on Occupational Health - ICOH  
Commission Internationale de la Santé au Travail - CIST  
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## SCIENTIFIC COMMITTEE

# INDOOR AIR QUALITY AND HEALTH

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### ***Business Meeting***

ICOH CONFERENCE 2015 - Seoul  
June 3 (Wed) 18.00-19.00 – Room 301B





**International Commission on Occupational Health - ICOH**  
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SCIENTIFIC COMMITTEE

# INDOOR AIR QUALITY AND HEALTH

- **Introduction – Objectives**
- **Activities**
- **Consensus Document**
- **Appointment SC Chairperson and Secretary 2015/2018**

*Business Meeting*

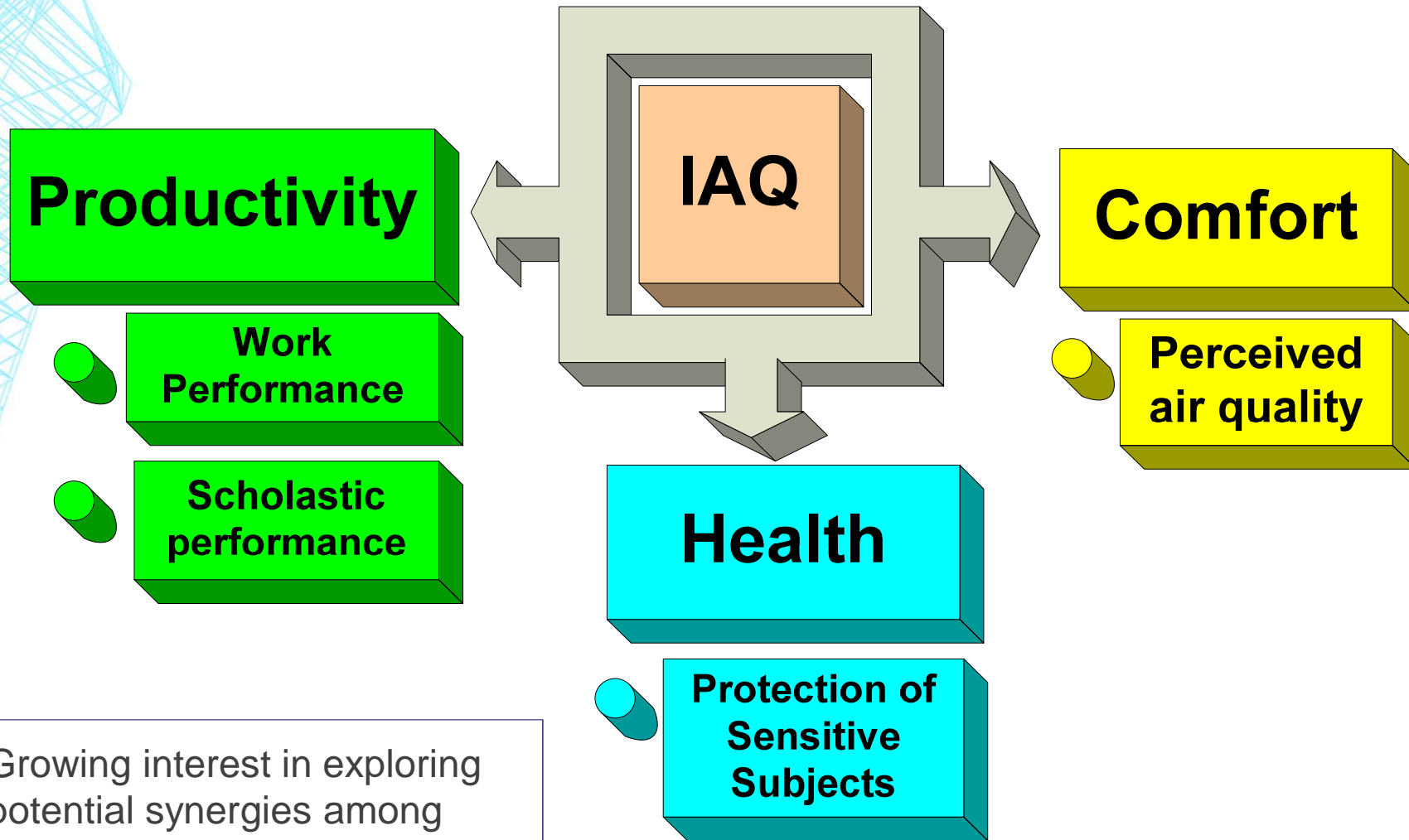
ICOH CONFERENCE 2015 - Seoul

June 3 (Wed) 18.00-19.00 – Room 301B

# BACKGROUND

- Workers employed in non-industrial sectors (offices, trade, banking, hospitals, schools, etc.), account for the main part of the labour force in many countries.
- Variety of chemical, physical, biological, ergonomic and psychosocial hazards with a potentially high and diversified impact of work-related health problems.
- Modern offices are created with the use of new components, materials, equipments and other consumer products, as well as new energy equipment (lightning, heating, cooling and ventilation) and energy efficiency strategies.
- Growing concern about the pollutants that may be emitted from building materials, office equipment (ozone, primary VOCs and particles) and about reactive indoor air chemistry.

# INDOOR AIR QUALITY AND HEALTH



Growing interest in exploring potential synergies among psychosocial stress and air pollution.





## ICOH SCIENTIFIC COMMITTEE - INDOOR AIR QUALITY AND HEALTH

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SCIENTIFIC COMMITTEE

# INDOOR AIR QUALITY AND HEALTH

*ASSESSMENT AND MANAGEMENT OF INDOOR AIR QUALITY  
PROBLEMS IN INDOOR ENVIRONMENTS  
FOCUSING IN PARTICULAR IN OFFICE BUILDINGS*

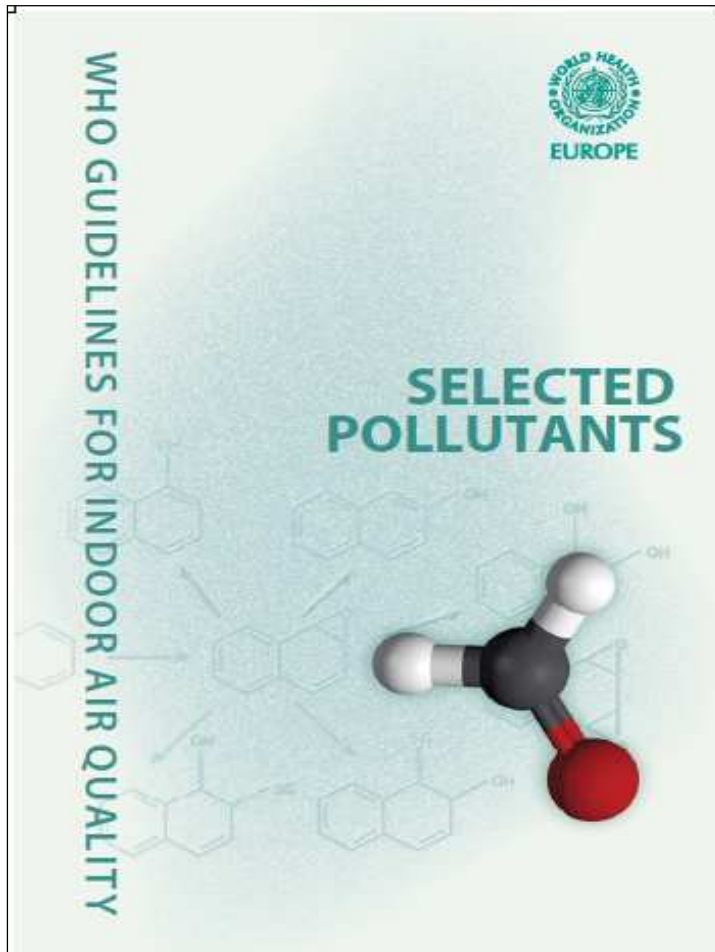
## - ACTIVITIES

*Business Meeting*

ICOH CONFERENCE 2015 - Seoul

June 3 (Wed) 18.00-19.00 – Room 301B





## Selected indoor chemicals targets at which health risks are significantly reduced

- Benzene
- Carbon monoxide
- Formaldehyde
- Naphthalene
- Nitrogen dioxide
- Polycyclic aromatic hydrocarbons (PAHs)
- Trichloroethylene
- Tetrachloroethylene
- Radon

# COOPERATION WITH NON-ICOH ORGANIZATIONS

European Commission, Institute For Health And Consumer Protection, Joint Research Centre:

- Participation in European Collaborative Action **“Urban Air, Indoor Environment And Human Exposure”**.
  - DG ENER Task 13.3 on "High energy efficient buildings, indoor air quality and health" - advisory board
- Participation in the working group **“Harmonization framework for health based evaluation of indoor emissions from construction products in the European Union using the EU-LCI concept”**



EUROPEAN COLLABORATIVE ACTION  
URBAN AIR, INDOOR ENVIRONMENT AND HUMAN EXPOSURE

Environment and Quality of Life

Report No 29

**Harmonisation framework for health based  
evaluation of indoor emissions from construction  
products in the European Union using the EU-LCI  
concept**



JOINT RESEARCH CENTRE  
Institute for Health and Consumer Protection  
Chemical Assessment and Testing Unit

2013

EUR 26168 EN

### Abstract

**ECA-IAQ (European Collaborative Action, Urban Air, Indoor Environment and Human Exposure), 2013. Harmonisation framework for health based evaluation of indoor emissions from construction products in the European Union using the EU-LCI concept, Report No 29. EUR 26168 EN. Luxembourg: Office for Official Publications of the European Communities**

This report describes a harmonised procedure for establishing a list of compounds and their associated LCI (Lowest Concentration of Interest) values for the evaluation of emissions from construction products (EU-LCI) taking into account existing procedures used in some Member States (i.e. ANSES in France and AgBB in Germany). It provides an appropriate health-protective, science-based and transparent yet pragmatic approach with a flexible framework that enables review of the EU-LCI procedure to take into account new knowledge (e.g. data resulting from the REACH implementation process) for future revision of the EU-LCI master list in terms of both the compounds listed and their EU-LCI values.

# PARTICIPATION AND SUPPORT TO WHO – ILO MEETINGS

- **TWO-DAY NATIONAL TRAINING WORKSHOP ON INDOOR AIR POLLUTION AND HEALTH**, WHO Regional Centre for Environmental Health Activities (CEHA) AMMAN, JORDAN, 21-22 FEBRUARY 2011
- Training course “**MONITOR-AIR-HEALTH**”, Enlargement and Integration Action Training Course - 2014-IHCP-A2, co-organized by WHO-Europe and JRC’s Institute for Health and Consumer Protection (IHCP), 22-24 September 2014, JRC-Ispra, Italy





# COOPERATION WITH IAQ SCIENTIFIC CONFERENCES

- Healthy Buildings 2012 – Brisbane, Australia
- Healthy Buildings 2015 – Eindhoven, The Netherlands
- Indoor Air 2016 – Leuven, Belgium

# COOPERATION WITH OTHER ICOH SCIENTIFIC COMMITTEES

- Collaboration with SC on “Rural Health, Agriculture, Pesticides and Organic Dusts SC”
- International Congress on Rural Health, September 2015, Italy



Wednesday, September 9 2015

Auditorium

Keynote Lectures

Chairs: Claudio Colosio – José Manuel Lopez Abuin

10.00 – 10.30

Paolo Carrer:

Indoor air pollution in rural areas: a priority for public health



# COOPERATION WITH OTHER ICOH SCIENTIFIC COMMITTEES

Possible cooperation with ICOH SC on:

- *Work and Vision*
- *Work Organisation and Psychosocial Factors*
- *Allergy and Immunotoxicology*
- *Respiratory disorders*



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## SCIENTIFIC COMMITTEE INDOOR AIR QUALITY AND HEALTH

# Activities at ICOH 2015 Seoul

Oral Session

***Indoor Air Quality and Health***

June 3 (Wed) 16.00-17.30 – Room 301B

Special Session

***Indoor Air Quality in Modern Office Buildings***

June 4 (Thu) 14.15-15.45 – Room 327C

Poster Session

***Indoor Air Quality and Health***

June 1-4 (Mon-Thu) 8.30-17.30 – Hall D1





# NEWSLETTER



International Commission on Occupational Health-ICOH

Commission Internationale de la Santé au Travail-CIST

Volume 11, Number 1

May 2013

## In this number

- || Message from the President 1
- || From the editor 3
- || Column: Advertising Ethical Guidance in UK 4
- || Occupational Health in Fine Arts, Music and Literature 7
- || ICOH National/Area Secretaries 10
- || Activities of the Scientific Committees - SC Indoor Air Quality and Health 11

## Message from the President

Dear ICOH Colleagues,

A clear trend is seen towards primary prevention of occupational and work-related diseases in varied work situations. According to the ILO estimates, there are globally about 2 million deaths annually caused by disease due to work. This is striking because diseases caused by work kill six times more workers than work-related accidents. It is estimated that the annual global number of cases of non-fatal work-related diseases amounts to 160 million. In addition to enormous human suffering to victims and their families, we are also struck by large economic losses



...ital with complex conditions of the working environment and work life. The effectiveness

## Activities of the Scientific Committees:

### - SC on Indoor Air Quality and Health

The occupational health services are increasingly requested in the non-industrial building sector (offices, banks, schools, etc.). Workers employed in such environments account for the major part of the labour force in many countries.

The indoor air quality (IAQ) in non-industrial buildings is an issue of increasing concern, because effects on health, well-being (comfort), and productivity have been increasingly reported during the last decades; furthermore, synergies with psychosocial stress may also turn out to be potentially important. Good IAQ in office buildings is important, because workers provide services of high relevance for the companies/communities. Furthermore, the office type could play a role in the prevalence of symptoms. Loss of productivity is not only related to symptoms and associated diseases due to the work environment (IAQ), but it may also result from less comfortable working environments and conditions.

Assessment and management of IAQ problems by occupational health services has been discussed by the experts of the Scientific Committee on Indoor Air Quality and Health and a Consensus Document is in preparation. A team approach with cooperation between medical and technical experts, including experts in toxicology, is recommended for an integrated health/comfort risk assessment of the buildings. This should be a combined step by step approach starting with a general walk-through inspection, then followed up by questionnaire survey and, eventually environmental measurements for specific indoor problem solving. The workplace is one of the priority settings for health promotion programme that include smoking cessation and stress management; programme for a better IAQ management may also be considered.



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University of Milan, Italy  
Chair, SC Indoor Air Quality and Health



**ICOH SCIENTIFIC COMMITTEE**

**INDOOR AIR QUALITY AND HEALTH**

**Consensus Document**

**Role of occupational health services in the assessment and management of indoor air quality problems**

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ICOH IDENTIFICAZIONE  
INDOOR AIR QUALITY PROBLEMS

# ROLE OF OCCUPATIONAL PHYSICIAN IN THE ASSESSMENT AND MANAGEMENT OF INDOOR AIR QUALITY PROBLEMS



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## INTRODUCTION

The occupational health services are increasingly requested to intervene in non-industrial sectors (offices, banks, schools, etc.).

Workers employed in such environments account for the main part of the labour force in many countries and they may be exposed to a variety of chemical, physical, biological, ergonomic and psychosocial hazards with a potentially high and diversified impact of work-related health problems (1).

The indoor air quality (IAQ) in non-industrial buildings is an issue of frequent concern and there is growing interest about the pollutants that may be emitted from office equipment (ozone, primary VOCs and particulates) and about reactive indoor air chemistry (5).

Effects on health, well-being, and productivity have been frequently reported during the last decades and there is an interest in exploring potential synergies among psychosocial stress and air pollution (5,6).

IAQ in office buildings is an issue of increasing attention also because it deals with workers providing services of the highest relevance for the companies/communities.

The concern regarding productivity is not only related to absenteeism and associated diseases due to the work environment, but it may also result from less comfortable working conditions (7, 9). Another issue is the ageing workforce and the general trend (in Europe) of the workforce in public offices to be reduced due to the economic situation.

## METHODS

The occupational health services are increasingly requested to assess the risk and monitor the health status of workers in non-industrial sectors.

This topic has been discussed by experts of:

- the Italian Society of Occupational Health (SIMP) (4)
- the Scientific Committee on Indoor Air Quality and Health of the International Commission on Occupational Health (ICOH) (3)
- a special session at the Indoor Air 2008 Conference (2).

The role of the occupational health services about assessment and management of indoor air quality problems has been proposed as in the Consensus document here reported.

## CONCLUSIONS

There is an increasing demand for the occupational health services to assess the risk and monitor the health status of tertiary sector workers.

A team approach with cooperation between medical and technical experts, including experts in toxicology, is recommended in the assessment and management of indoor air quality problems.

Guidance about the role of the occupational health service in the assessment and management of IAQ problems has been provided and includes collaboration in risk assessment, use of a questionnaire for comfort evaluation of the workers, health surveillance when already performed for other risks (e.g. video display units) or in case of specific clinical examinations and health promotion.

## Consensus Document

### ROLE OF OCCUPATIONAL PHYSICIAN IN THE ASSESSMENT AND MANAGEMENT OF INDOOR AIR QUALITY PROBLEMS

#### 1. Collaboration in risk assessment – risk management

An integration of building assessment, environmental measurements and questionnaire survey is recommended for periodical risk assessment and specific indoor problem solving. The contribution of the occupational health service could be as follows:

- Information meeting at the company site with the safety committee, working environment consultants and/or the Working Environment Authority; the primary goal is to clarify the type of indoor climate problems reported and prioritized in the workplace evaluation.
- Inspection of the company workplace.
- Planning of future activities:
  - Collaboration at the technical building assessment (definition of the IAQ measurements) and evaluation of the results.
  - Questionnaire survey (see below).
  - Individual clinical examination if required (see below)
- Evaluation of the results and definition of the risk management activities.

#### 2. Questionnaires

The diagnosis of problem buildings/offices is not at individual level in the traditional medical sense but rather a diagnosis at group level with the implementation of a questionnaire survey.

Standard questionnaires to be used in indoor climate cases are available. Questionnaires should cover questions about the indoor climate as well as psychosocial working aspects.

Distribution and collection of questionnaires can be performed by the company's safety representative or committee.

An important role of the occupational health service is the analysis and interpretation of the results.

The results of a questionnaire survey can be used for mapping the perceived indoor climate and the psychosocial aspects and to prioritize the order in which the problems should be tackled.

#### 3. Health surveillance

Individual health surveillance in relation to IAQ is proposed only when periodical health surveillance is already performed for other risks (e.g. Video Display Units) or when individual clinical examination of workers is required due to the occurrence of diseases that can be linked to IAQ (e.g. Legionnaire's disease), recurrent inflammation, infection of eyes, respiratory airway effects, and sensorial disturbances.

The examination of individuals must encompass:

- Workplace description, that includes building and offices, ventilation and thermal climate conditions, amount of space and number of people, lighting, standard of cleaning, visible water damages and/or mould growth, plus experience of cold feet, cold/warm air, dry or stuffy air, smells and noise in the workplace.
- Description of symptoms, with special regard to mucous membrane, skin and general symptoms, and relationship with work (symptoms starting point and development); when do symptoms appear during the week; symptom presence on working days and/or days off and seasonal variation; similar symptoms reported by colleagues).
- Routine physical examination, focusing on eyes, nose, throat and lungs.
- Allergy evaluation, when indicated; for example, in case of asthma and/or rhinitis, where allergens are suspected at the workplace e.g. mould growth, animal fur and plants.

#### 4. Health promotion

WHO states that the workplace "has been established as one of the priority settings for health promotion into the 21st century" because it influences "physical, mental, economic and social well-being" and "offers an ideal setting and infrastructure to support the promotion of health of a large audience". Workplace health promotion programs include smoking cessation and stress management.

Programs for a better IAQ management may also be considered.

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# **The role of the occupational physician in the assessment and management of indoor air quality problems**

- 1. Collaboration in risk assessment – risk management**
- 2. Questionnaire**
- 3. Health surveillance**
  - **Medical examination for specific indoor problem**
  - **Periodical medical surveillance**
- 4. Health promotion**

# 1. Collaboration in risk assessment – risk management

A team approach, with cooperation between technical and medical experts, is recommended both for:

## **a. Specific indoor problem solving:**

- . Renovation, Survey of accidents, fire, leakage

## **b. Periodical risk assessment**

Integration of

- . Building assessment (from checklist)
- . Environmental measurements
- . Questionnaire

# Collaboration in risk assessment – risk management

Role of the occupational physician in group surveys:

- **Information meeting** at the company site with the safety committee; primary goal is to clarify the type of indoor problems reported in order to prioritize in the workplace evaluation
- **Inspection** of the company workplace.
- **Planning activities:**
  - . Working environment assessment
  - . Questionnaire survey
- **Assessment and management** of the results



## 2. Questionnaire survey

In larger companies a questionnaire survey may provide a good overview.

**Standard questionnaires** to assess worker's comfort to be used in indoor climate cases are available.

There is a need to develop Questionnaires with questions about the **indoor climate** as well as **psycho-social working aspects**.

### **Analysis and Interpretation of the results**

The results of a questionnaire survey can be used for **mapping** the perceived indoor climate and the psycho-social aspects and to **prioritize** the order in which the problems should be tackled.

# 3. Health surveillance

Individual health surveillance in relation to IAQ is proposed:

- not for ***periodical health surveillance***; only if already performed for other risks (e.g. work with video display units).
- when ***specific clinical examinations*** of workers are required
  - occurrence of diseases that can be linked to IAQ (e.g. Legionnaire's disease, allergic diseases, humidifier fever, recurrent inflammation, infections of eyes, respiratory airways, and sensorial disturbances)
  - accidental events (fire, leakage).



# Health surveillance

→ *information/teaching* of the workers about indoor health risks and related diseases/symptoms in order that they inform the occupational physician when they suspect



# DIAGNOSTIC APPROACH TO INVESTIGATE SYMPTOMS/DISEASES RELATED TO POOR IAQ

## IS THE DISEASE RELATED TO THE IAQ OF THE WORKER ENVIRONMENT ?

### - EXPOSURE HISTORY

- work environment features: office type, age, ventilation, furniture, instruments, products, smoke
- work activities: use of PC, instruments
- environmental data: environmental monitoring

### - CLINICAL HISTORY

- symptom description, correlation with work activity, reproducibility

# Individual medical examination

- **Workplace description**: building and offices, ventilation and thermal climate conditions, amount of space and number of people, lighting, standard of cleaning, visible water damages and/or mould growth, plus experience of cold feet, cold/warm air, dry or stuffy air, smells, static electricity and noise in the workplace.
- **Description of symptoms**: special regard to mucous membrane, skin and general symptoms, and relationship with work (symptoms starting point and development; when do symptoms appear during the week; symptom presence on working days and/or days off and seasonal variation; similar symptoms reported by colleagues).
- **Physical examination**: focusing on eyes, nose, throat, skin and lungs.
- **Allergy evaluation**: when indicated, for example, in case of asthma and/or rhinitis, where allergens are suspected at the workplace e.g. mould growth, animal fur and plants.

# Periodical medical surveillance in relation to IAQ?

**Only when already planned for other risks  
(e.g. use of personal computer)**

In the context of medical activity planned for occupational risk prevention verify the presence of health problems related to IAQ

e.g.: assessment of indoor causes of *eye symptoms* in office workers using PC; interaction with other risk factors such as physical parameters, ergonomic factors and mental stress.



# 4. Health promotion in the workplace

Strategy to improve health and wellbeing mainly devoted to control/reduce risk factors to CVD and cancer

WHO states that “***the workplace has been established as one of the priority settings for health promotion into the 21st century***” because it influences “physical, mental, economic and social well-being” and “offers an ideal setting and infrastructure to support the promotion of health of a large audience”.

Workplace health promotion programs usually include ***smoking cessation***, physical activity, correct diet and ***stress management***.

⇒ Programs for a better ***IAQ management*** may also be considered.

# ROLE OF OCCUPATIONAL PHYSICIAN IN THE ASSESSMENT AND MANAGEMENT OF INDOOR AIR QUALITY PROBLEMS

## Conclusions

- IAQ in working environments: complexity of indoor risk factors – important health and social-economical impact
- Need to develop an integrated approach based on a strict collaboration among health and technical professionals:
  - Risk assessment and risk management: *planning and evaluation*
  - Health and comfort monitoring of workers - *Questionnaire*
  - *Medical examination* when specific health problems suspected to be related to indoor air
  - *Information/teaching* workers about IAQ risks/health effects/prevention – health promotion



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## SCIENTIFIC COMMITTEE

# INDOOR AIR QUALITY AND HEALTH

### Activities 2015/2018

- Collaborations with ICOH and non ICOH committees
- Organisations/collaborations in IAQ events (IA 2016 and ICOH 2018)
- Consensus documents
- New members

### Appointment Chairperson and Secretary 2015/2018

- Chairperson .....
- Secretary .....

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