

Introduction to COST-Action No. 15129: **DiMoPEx (Diagnosis, Monitoring, Prevention of Exposure Related Non-Communicable Diseases)**

WG6: Burden of Noncommunicable diseases and clinical diagnosis.

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Aims

WG.6 Burden of Noncommunicable diseases and clinical diagnosis.

Objectives: Non-communicable diseases comprising cardiovascular, lung, and neurological diseases, diabetes as well as cancer, represent an increasing health threat to European and world-wide societies. They do not only cause premature deaths and increased morbidity, but also have a significant economic impact. Cost-effective and evidence-based interventions and tools to prevent and control various non-communicable diseases include:

- to reduce causative exposures/risk factors
- early detection and management of respective disorders
- Surveillance of endangered populations to monitor trends in risk factors and diseases.

Such interventions are feasible; they necessitate a paradigm shift, i.e. from considering each singular exposure to addressing collectively disease clusters in an integrated manner (“exposome”), also from a separated clinical to a public health approach guided by the principles of universal access and social justice, and from action expected from the health sector alone to a broad-based, coordinated and intersectional whole society access and social justice, and from action expected from the health sector alone to a broad-based, coordinated and intersectional whole society. An integrated approach targeting all major common risk factors is clearly the most cost-effective way to prevent and control the common non-communicable diseases with the aim of reducing premature mortality and morbidity of chronic non-communicable diseases, but also the need to integrate primary, secondary, and tertiary prevention, health promotion and related programs across sectors and different disciplines.

In order to enhance interdisciplinary cooperation a clinical network on exposure-related diseases will cooperate with DiMoPEX partners.

Description of work

- to carry a systematic review of literature, evaluating and defining best evidence reporting implication of non-communicable disease for the diagnosis of chronic disorders.
- to contribute to the training and teaching activities of the DiMoPEX network
- to develop common diagnostic scheme guidelines to aid physicians and public health workers to make use of the best evidence.
- to integrate non-communicable diseases intervention initiatives in the health system based on primary health care
- to encourage partners to initiate joint collaborative clinical case studies and field studies of environmental/occupational disorders
- to disseminate knowledge in joint publications, protocols and case reports



Recent estimates

- 155 000 lung cancer and 23 000 mesothelioma cases were attributable to asbestos in 2015 globally

Forouzanfar MH et al Lancet 2015; 386: 2287–2323

- The total burden of lung cancer cases attributable to work-related exposure to respiratory carcinogens in Europe: 32 400 cases per year

Gibson J et al. The European Lung White Book. ERS, 2013; pp. 282–295



Systematic reviews I

- WP 6 participated in the IMExAllergy review





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REVIEW ARTICLE

Allergy EUROPEAN JOURNAL OF ALLERGY AND CLINICAL IMMUNOLOGY  **WILEY**

Immunological methods for diagnosis and monitoring of IgE-mediated allergy caused by industrial sensitizing agents (IMExAllergy)

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DiM



Systematic reviews II

- WP 6 planned another review
 - New-onset asthma and COPD and anthropogenic environmental air pollution

Systematic Review: New-onset asthma and COPD and anthropogenic environmental air pollution

Results of DiMoPex meeting in Barcelona, PICO and extended by Harald Lux; Astrid Heutelbeck, Occupational, Social and Environmental Medicine, Jena; Xaver Baur, EOM

PICO-approach	
Problem: New-onset Asthma and COPD (non tobacco-related)	P
Population	
<ul style="list-style-type: none"> • General population: pre-natal, pediatric, adult, occupational • occupational population <ul style="list-style-type: none"> • Outdoor workers more exposed than the general population to environmental pollutants (e.g., taxi drivers, policemen)* • Workers who handle substances that also spread to the (regional) environment (when „environmental bystander population“ is secondarily affected) (e.g., chemical, harbour workers) • athletic (exercise) population (e.g., cyclists including commuting to work)* 	
	*Intensive exposure in shifts/intervals
Exposure („Intervention“)	I
<ul style="list-style-type: none"> ⇒ Included: <ul style="list-style-type: none"> • Outdoor: <ul style="list-style-type: none"> • Gases (chemicals?) • Particles • Pollen and fungal spores, other allergens • Substances that spread to environmental air from industry (workplaces) • other exposures (see next slide) ⇒ excluded: <ul style="list-style-type: none"> • Exposure by handling of hazardous substances exclusively present in workplaces/no significant amount in the general environment • Exclusively natural pollen/fungal spore specific 	
Comparison	C
<ul style="list-style-type: none"> • Non-/less exposed population: • Exposed in workplace/ in environment/ not exposed in environment (could be compared) 	
Outcome (for disease see P)	O
<ul style="list-style-type: none"> • Morbidity • Incidence(?) • Prevalence(?) • Risk ratio(?) 	
Free summary of possible specifications: Effect of exposure in the environment/outdoor on asthma and COPD morbidity <ul style="list-style-type: none"> • of single pollutant-specific exposure and mixed exposure • Health effect-modulating interactions among multiple pollutants in mixed exposure: <ul style="list-style-type: none"> • within chemicals and gases • of bioaerosols and other chemicals/gases on respiratory allergy (asthma and rhinitis) 	

Studies of interest

Specific for exposure („Intervention“): Substances/pollution or systematic review

PROPOSAL

1. Direct effects of anthropogenic pollution (including mixed exposure)

E.g., exposure to particles; NO2 from fossil fuel and wood combustion

Excluded: Hazardous substances exclusively present in workplaces/ no significant* amount in the general environment

*"not significant" could include "no studies available", "no confirmative studies available", "just single accidental release"

2. Direct effects of secondary anthropogenic (anthropogenic by human responsibility/impact, not by source)

E.g., exposure to particles and NO2 from wild fires (climate change), release of natural allergens into environmental air (industry)

3. Effects due to anthropogenic AND natural pollution

Anthropogenic pollution

Chemicals, gases

AND

Natural pollution

Bioaerosols
Pollen
Fungal spores

Effect-modulating mechanisms in mixed exposure

Work packages and groups from Barcelona

Methodological preparations:
Harald, Torben, Xaver, Maria Albin

PROPOSAL: New group structure to be formed after discussion/agreements

Occupational/athletic population and aspects: Xaver, Joao, Diana, Maria Albin (?), Lygia (?), Astrid (?), Harald

Interactions of chemicals/gases, with respiratory allergy (pollen, fungi): Xavier, Jacob, Per, Maria Cruz, Torben, Thanos, Ozlem, Astrid, ...

Occupational/athletic population: Xaver, Joao, Diana, Maria Albin (?), Lygia (?), Astrid (?), Harald

Gases: Pavlos, Anasthasia and Jeroen

Pollen + fungi: Torben, Thanos and Ozlem

Interactions of chemicals/gases: Lygia, ...

Particles: Xavier, Jacob, Per, Maria Cruz

Particles: Xavier, Jacob, Per, Maria Cruz

others?

Methodological preparations: Harald, Torben, Xaver, Maria Albin

DiMoPEx



Spectrum of exposures and diseases I

Remaining «classical» exposures and diseases

- Asbestos:
 - A collaboration has started btw AU Sigsgaard, Barcelona Cruz & Berlin Baur on the use of asbestos body measurements as proof of exposure to asbestos,
- Mining industry
- Occupational cancer
- COPD
- Asthma and dermatitis
- Pneumoconiosis
- Hypersensitivity pneumonitis



Spectrum of exposures and diseases II

Selected recent exposures and diseases

- Urban air pollution
 - Heating and diesel exhaust
 - Lung and heart disease
- Silica
 - Denim sandblasting and new
- Coal
- Bioaerosols
 - Biotechnology and sewers
- Nanomaterials
- Cleaning agents and disinfection
- Diacetyl (2,3-butanedione)
- indium-tin oxide (ITO) workers



Possible interventions

- Education
- Exposure reduction or cessation (primary prevention)
- Health surveillance and early diagnosis (secondary prevention)
- Monitoring prevalence of risk factors and diseases



Burden of Noncommunicable diseases and clinical diagnosis

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