Towards the elimination of occupational cancers in the Russian Federation: cancer research for cancer prevention

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Projected burden of cancer: World (2012-2030)

Assuming no change in underlying incidence

Incidence
- 2012: 14.07 million cases
- 2030: 21.65 million cases
- 53.9% increase

Mortality
- 2012: 8.20 million cases
- 2030: 13.04 million cases
- 59.0% increase
Why cancer prevention?

- Most cancers only curable in early stages
- Several cancers come with severe suffering
- Cancer treatment has severe side effects and often late effects
- Cancer treatment has high economic burden
- Reduction of the cancer burden by primary prevention
Attributable cancer risks (UK)

- Tobacco: 60,837 (19.4%)
- Unhealthy diet: 29,466 (9.2%)
- Overweight, obesity: 17,294 (5.5%)
- Alcohol: 12,458 (4.0%)
- Occupation: 11,494 (3.7%)
- UV radiation: 11,097 (3.5%)
- Infections: 9,745 (3.1%)
- Ionising radiation: 5,807 (1.8%)
- Lack of physical exercise: 3,275 (1.0%)
- Low reproduction/breastfeeding: 2,699 (0.9%)
- Post-menopausal hormones: 1,675 (0.5%)

Total: 52.6%
Why cancer prevention in occupational and environmental health?

• Several carcinogens at the workplace or in the environment have been identified and most of them are modifiable risk factors.

• ILO* estimate: >650,000 cancer deaths per year worldwide due to occupation (50-75% of them due to lung cancer)

* International Labor Organization
Occupational cancers (1)

- Human (epidemiology) and toxicology research and exposure characterisation complementing each other
- Global evidence synthesis for classification of carcinogenicity, e.g. by IARC Monograph Program
- Definition of global prevention framework

- Absolute cancer burden must account for local situation
  - baseline cancer risk and competing risks
  - work situation (exposure levels, protection measures)
- Preventive action to be tailored to local situation
Occupational cancers (2)

- Majority of research from North America/Western Europe
- Situation in Russia
  - Very large work force in various large scale industries
  - Good documentation of working situation and exposures
  - Distinct exposures by type, duration and levels
- Utilise for:
  «Russian Research Initiative into Occupational Cancer»
- Essential for prevention program to eliminate occupational cancer in Russia
- Informative on global scale for occupational cancers
Russian Research Initiative on Occupational Cancer - Initial steps -

I) Registry of occupational cancers

II) Multi-site case-control study on occupational risk factors

III) Prospective follow up of chrysotile workers
Registry of occupational cancers

- Population based cancer registries
- Create legal framework for record linkage between registries
- Linking workforces with cancer registry and vital status for registry of potential occupational cancer cases
- Notification of cancer cases in workforce accepted as being cancer case due to their occupation
Multi-site case-control study (1)

Launched in Rostov oblast because

- Availability of population based cancer registry
- Various industries with known or potential carcinogenic exposures
- Model region for developing core protocol for Russian Federation

Cases:
Multi-site three year incident diagnosis of cancers of the lung, head and neck, bladder, and stomach

Controls:
Frequency-matched recruited through local poli-clinics
Multi-site case-control study (2)

Exposure assessment:
- Questionnaire / Interview (Lifestyle, occupation)
- Workbook
- Residential and occupational history

Potential industries:
- Coal mining, agricultural, heavy metal, textile

Partnership:
RI OH, IARC, Occupational Health Center Rostov, Cancer Registry at Oncology Dispensary, Poli-Clinics
Prospective follow up of chrysotile workers

- Enrolment of world-wide largest cohort of workers in chrysotile mines and factories in Asbest (N=37000)
- Largest female workforce of chrysotile workers
- Retrospective study of workforce 1975-2010 followed up for cancer mortality

- Prospective follow up
  1) Cancer incidence
  2) Individual co-factors
  3) Biological samples

=> Presentations by E. Kovalevskiy and D. Hashim
Cancer prevention? NOW

Mesothelioma mortality in Germany

Eastern part

Western part

All ages
Ages 80+
Ages 65-79
Ages <65

Schonfeld et al., Cancer Causes Control, 2014
Conclusions (1):
Towards the elimination of occupational cancers in the Russian Federation

• Cancer Prevention Potential:
  Between 1 in 10 to 1 in 20 cancers are currently due to occupational (modifiable) exposures

• Several workplace agents established as carcinogenic

• As cancer develops slowly prevention needs to be implemented as early as possible

• Russia has longstanding tradition in successful protection of workers health and respective medical infrastructure and networks operate very well
Conclusions (2):
Towards the elimination of occupational cancers in the Russian Federation

• Epidemiology to optimise and monitor and explore the unknown:
  *Russian Research Initiative into Occupational Cancer* to:
  1) inform preventive measures adapted to local situation
  2) enhance global knowledge on occupational cancer

• Utilise wealth of existing data and start targeted epidemiological studies on occupational cancers with:
  - Registry of occupational cancers
  - Multi-cancer case-control study
  - Continuation of prospective follow up of chrysotile workers
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