



# Global cancer burden and the urgency of rigorous cancer control

International Agency for Research on Cancer  
Lyon, France

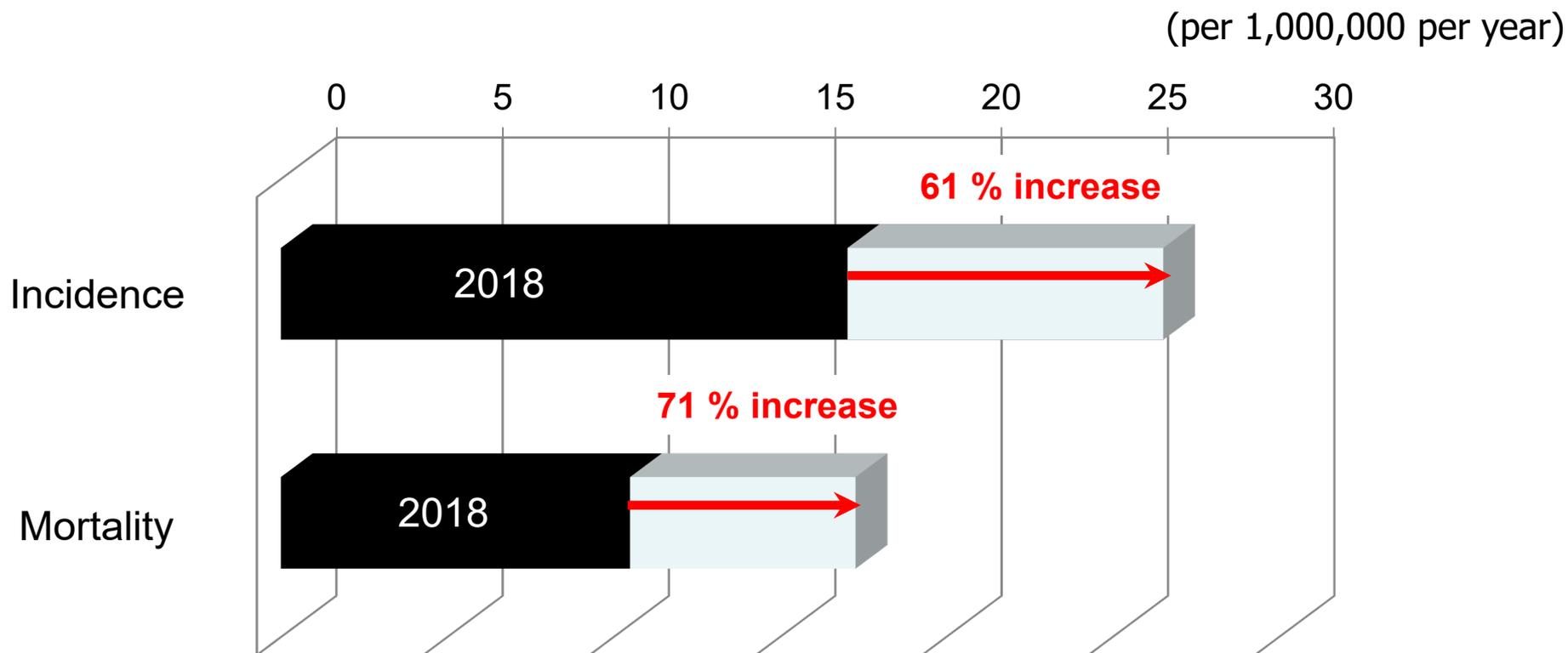
**Presented by the IARC**

Dr Elisabete Weiderpass, Director

Dr Joachim Schüz, Head of Environment and Radiation

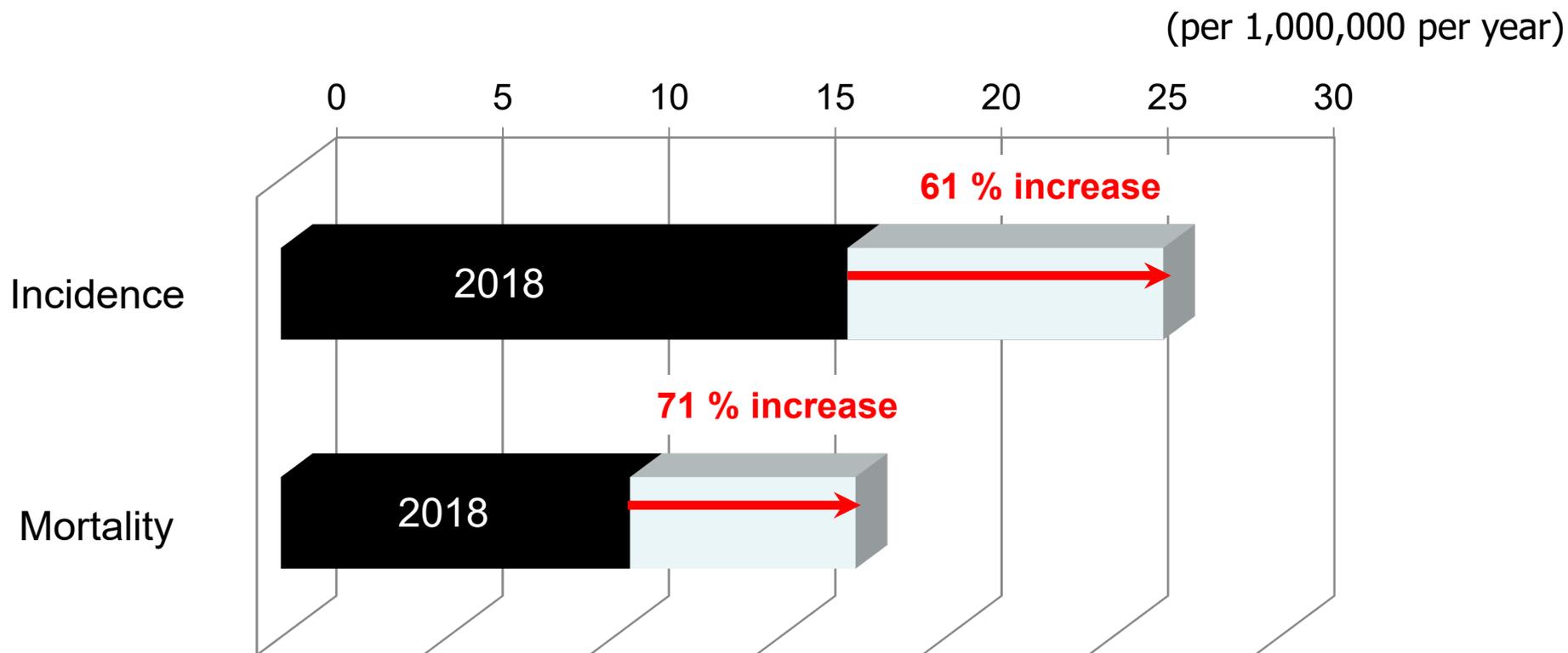
International Agency for Research on Cancer

# Projected burden of cancer: World (2018-2040)



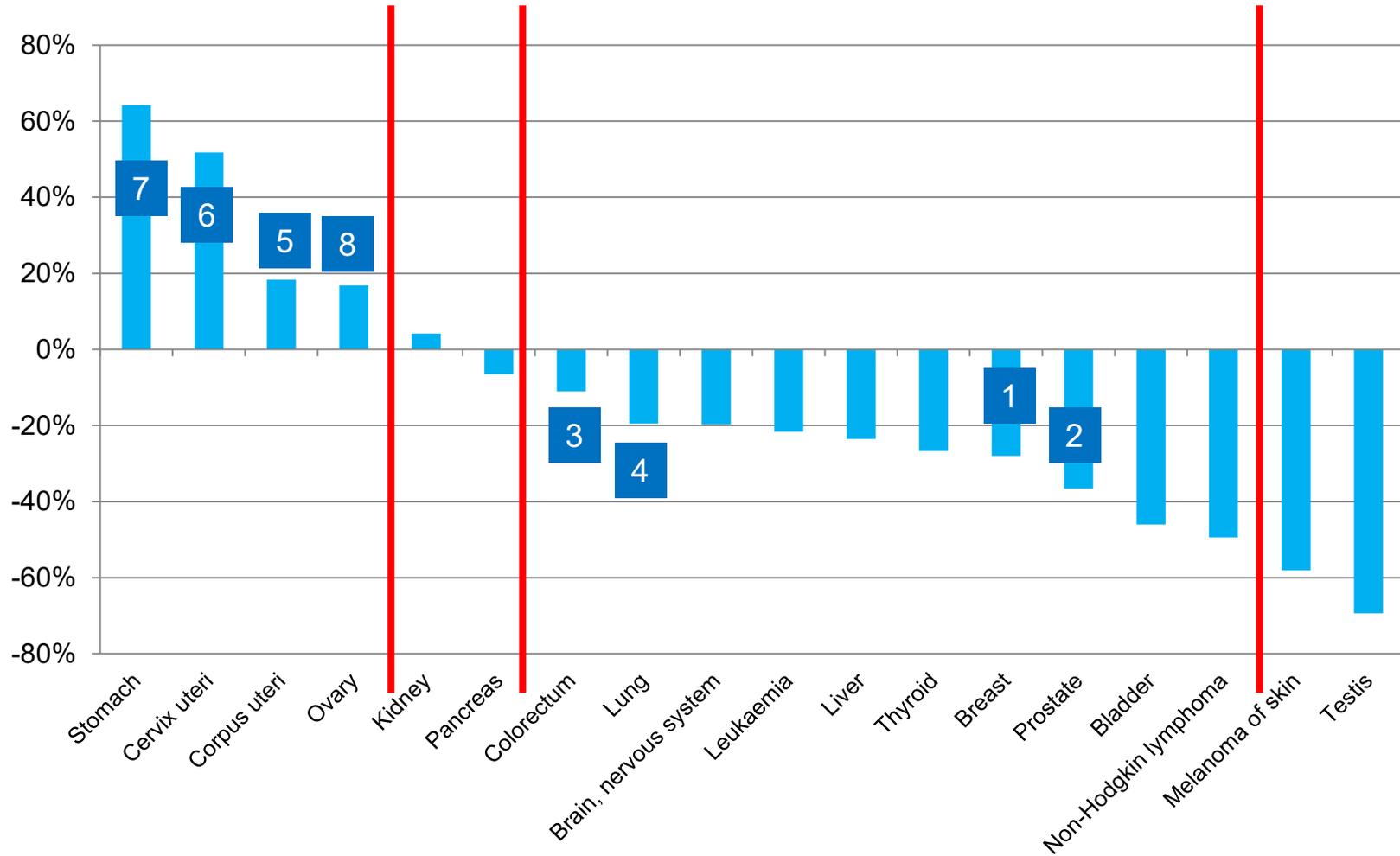
*Assuming no change in underlying incidence  
(excluding non-melanoma skin cancer)*

# Projected burden of cancer: World (2018-2040)

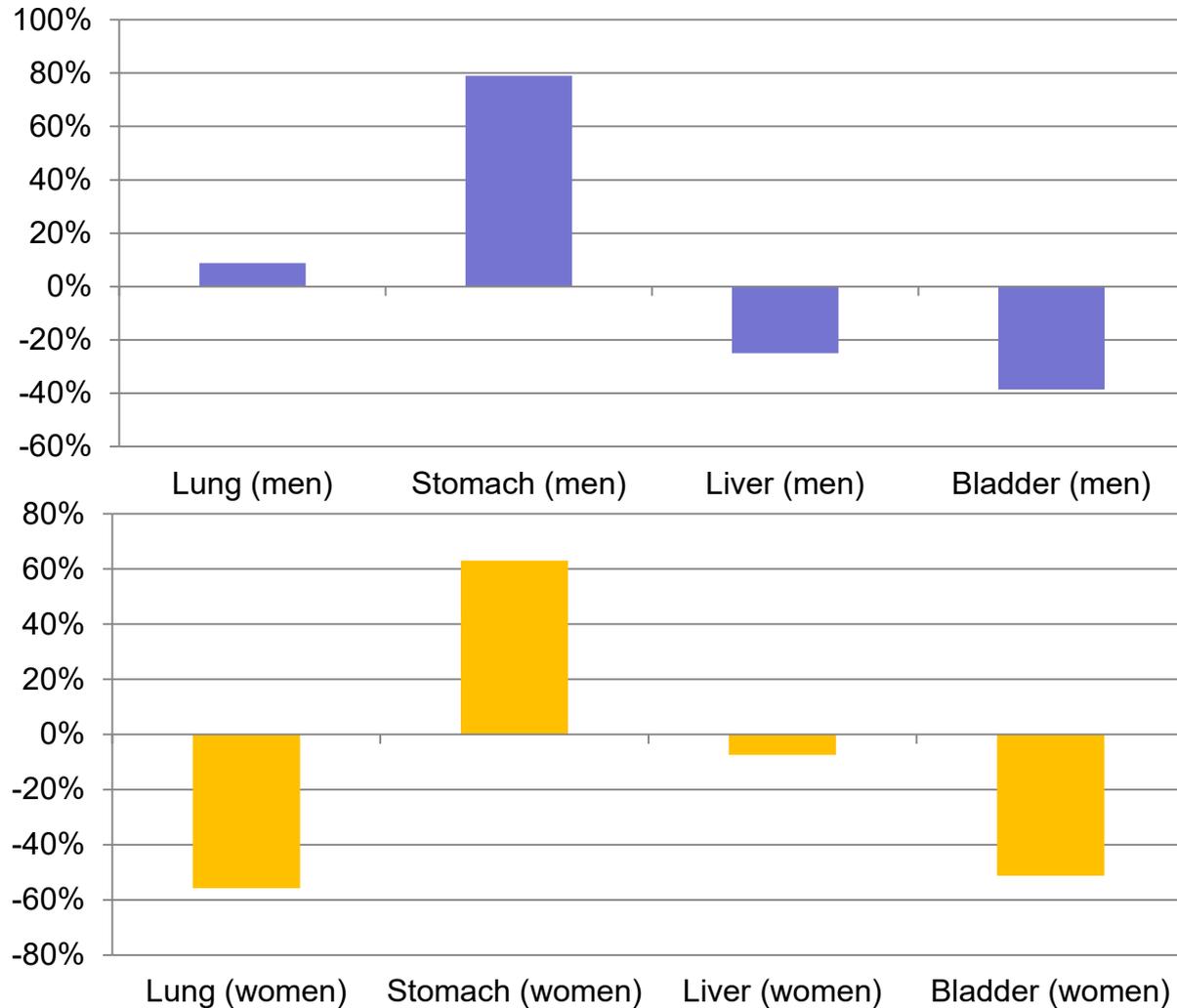


*Approximately 500 million newly diagnosed cancers during this period*

# Comparison cancers between the Russian Federation and Europe UN40



# Comparison cancers between the Russian Federation and Europe UN40



International Agency for Research on Cancer

*No country can afford to treat its way out of the cancer problem*

A balanced, integrated approach to prevention, early detection and treatment is required

*Up to 40% of all cancers today are preventable with rigorous cancer prevention*

# Why cancer prevention?

- Cancer burden too big to rely only on advances in treatment
- Most cancers only curable in early stages
- Several cancers come with severe suffering of people before they die
- Synergies: Cancer control = NCD control

Molecular  
Oncology

REVIEW ARTICLE

## **Primary prevention: a need for concerted action**

Joachim Schüz, Carolina Espina and Christopher P. Wild

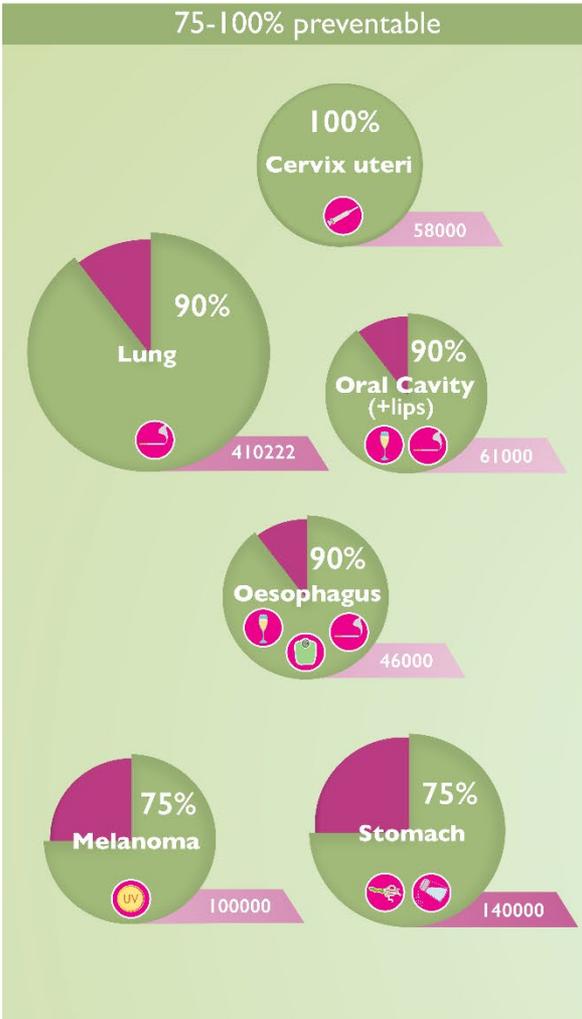
International Agency for Research on Cancer (IARC), Lyon, France

International Agency for Research on Cancer

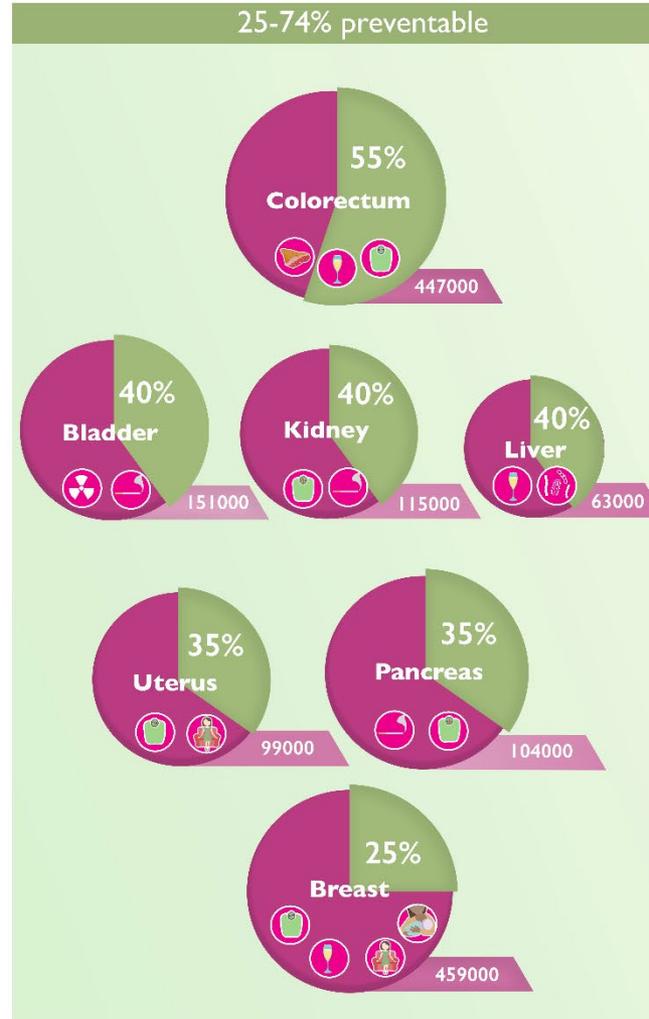


# Cancer prevention: the potential for primary prevention in Europe

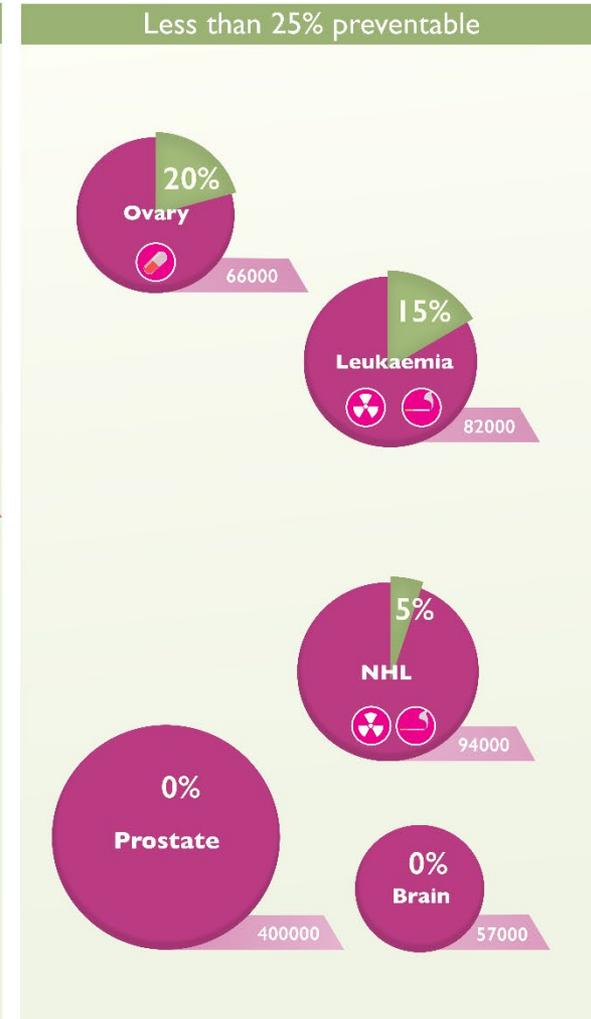
## 75-100% preventable



## 25-74% preventable



## Less than 25% preventable



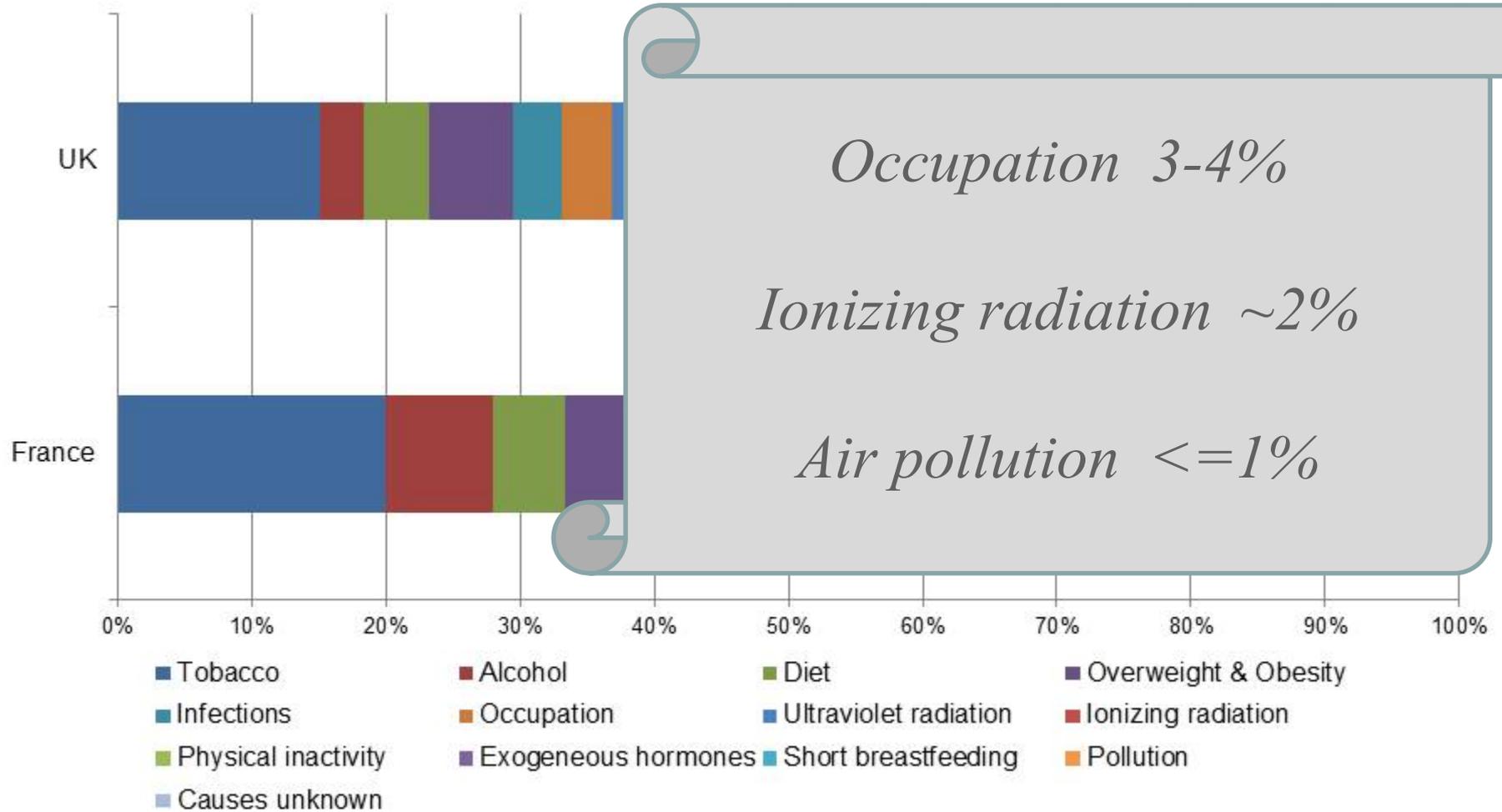
International Agency for Research on Cancer



Numbers of cancers in Europe  
2012 incidence estimates

\*Preventability estimates are for UK

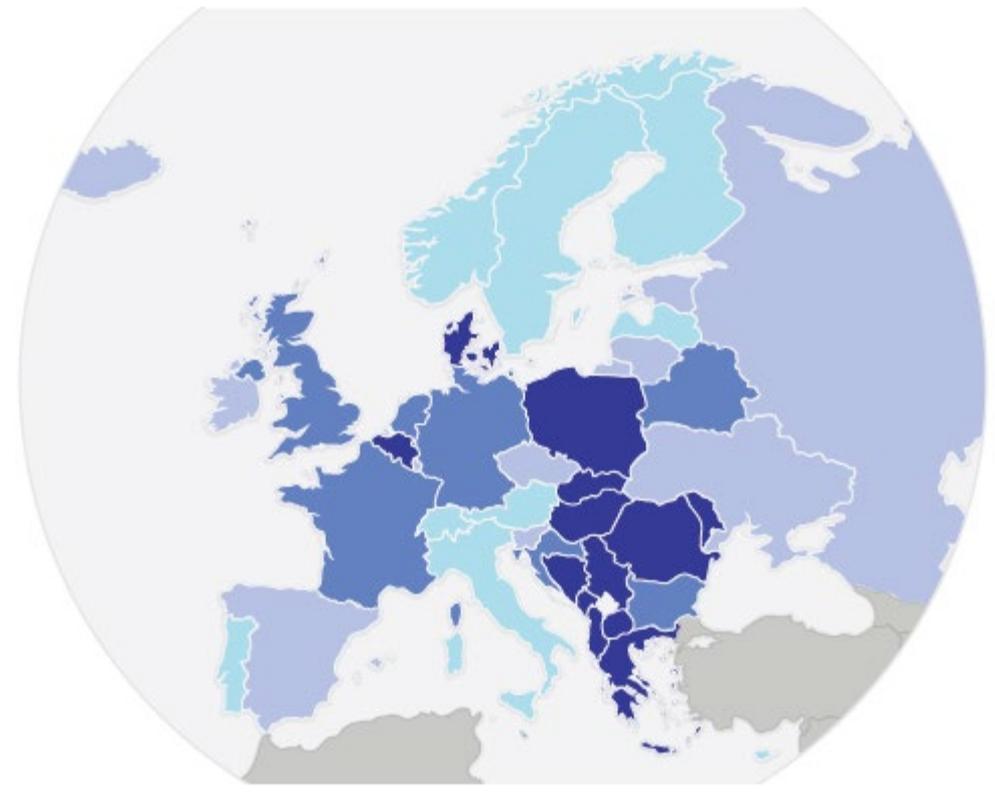
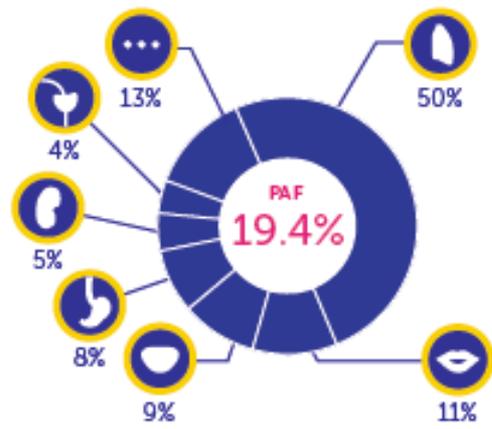
# Cancer prevention: the potential for primary prevention in Europe



# Cancer prevention: the never-ending tobacco-caused cancer epidemic

Preventable smoking related cancer cases

- Cancer sites
- Lung
  - Lip, oral cavity and pharynx
  - Bladder
  - Stomach and oesophagus
  - Larynx
  - Kidney
  - Other (colorectal, liver, pancreas, AML, cervix, ovary)



← - %PAF    European average    → + %PAF

Sweden ~10%

Hungary >30%

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IARC for Cancer Prevention Europe

# Twelve ways to reduce your cancer risk

## European Code against Cancer (ECAC) 4<sup>th</sup> edition



**Tobacco**



**Second-hand smoke**



**Healthy body weight**



**Physical activity**



**Diet**



**Alcohol**



**Sun / UV**



**Occupational chemicals**



**Radon**



**Breastfeeding**

**Hormonal therapy**



**Vaccination**



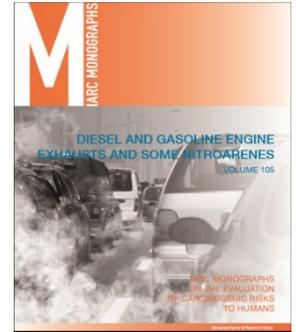
**Screening**

<http://cancer-code-europe.iarc.fr/>

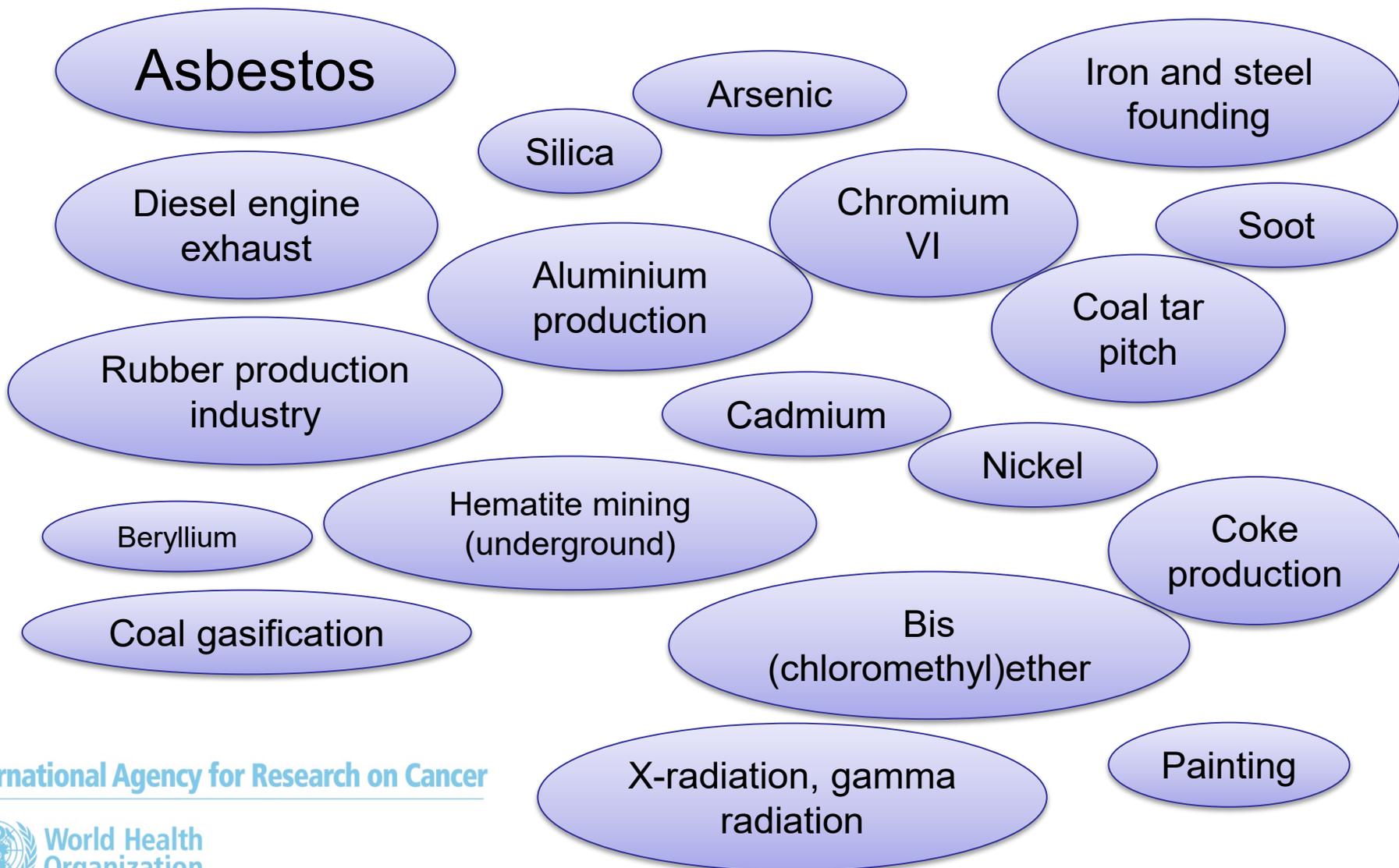
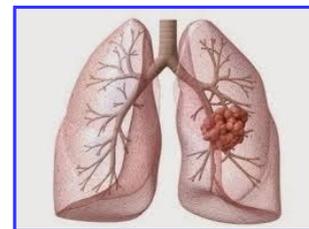
# IARC Hazard Assessment: Occupations and occupational carcinogens

120 agents classified as carcinogenic to humans

- 12 Occupations or industry processes
  - Painter, Aluminium production, magenta production
  - Coal gasification, iron/steal founding, mining, coke production
- 47 occupational carcinogens
  - Asbestos
  - Particulate matter, diesel, soot, welding fumes, ETS
  - Radiation, Silica, UV, Mineral oils, Benzene
  - Wood dust, Vinyl chloride, some Insecticides

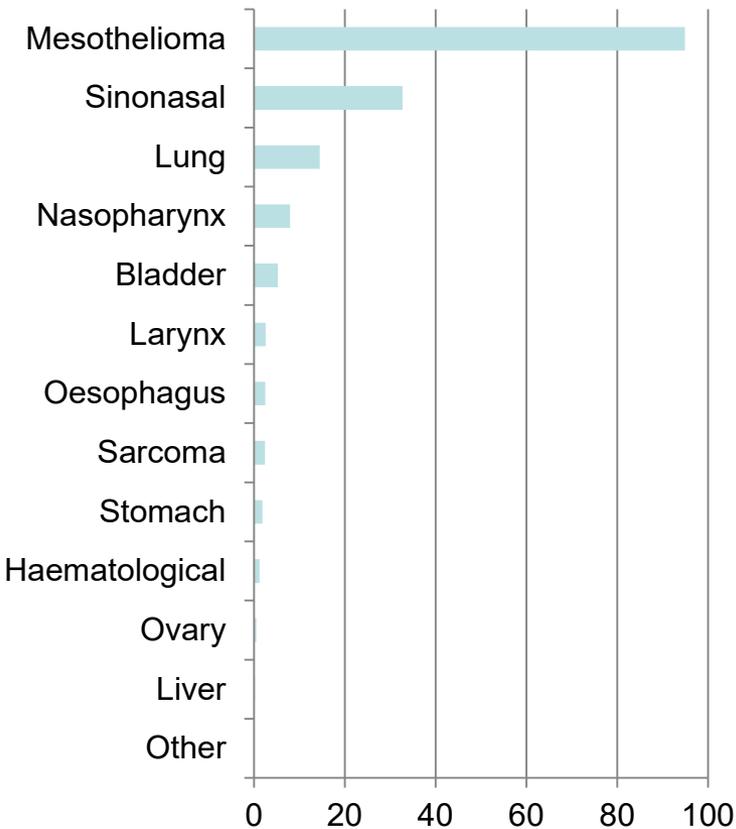


# Occupational risk factors for lung cancer

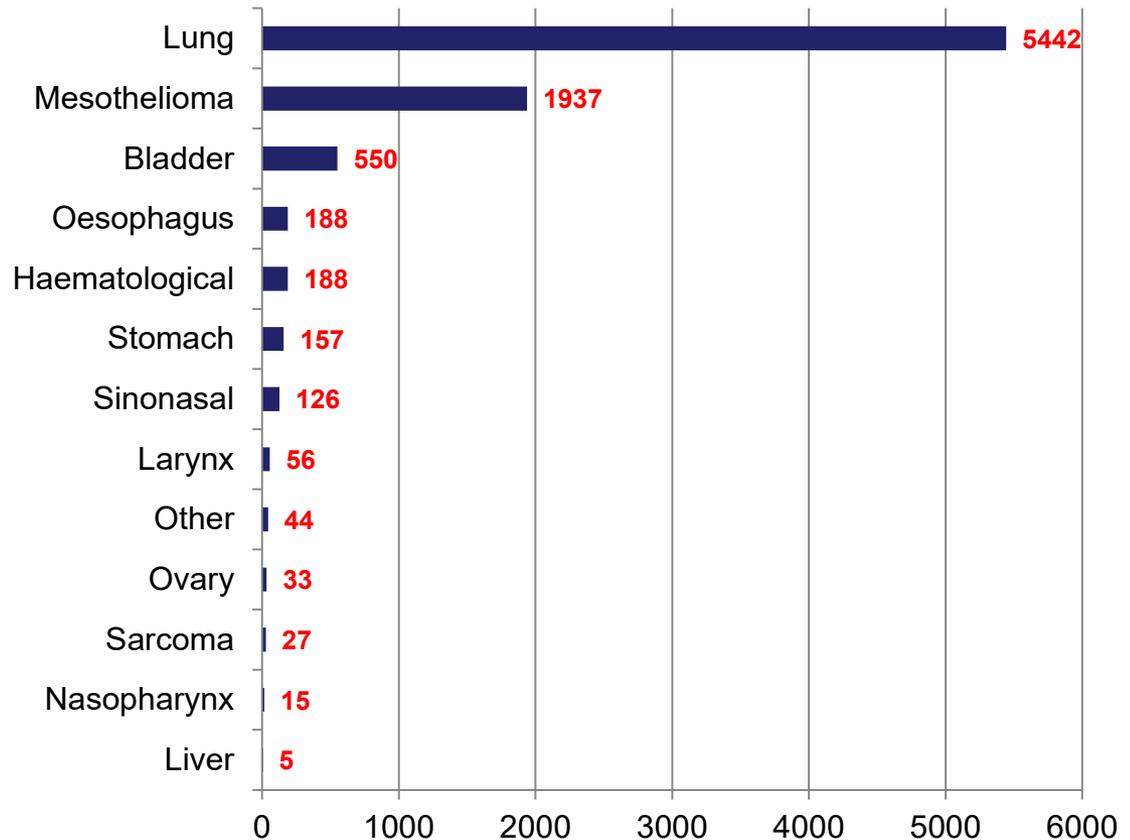


# Occupational Cancers – UK estimates

% of Cancers caused by occupational exposures  
(TOTAL = 3.7%)



Numbers of cancers caused



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Rushton et al., Br J Cancer, 2010

- Excluding Non-melanoma skin cancer
- Excluding Shiftwork / Breast Cancer as not Class 1

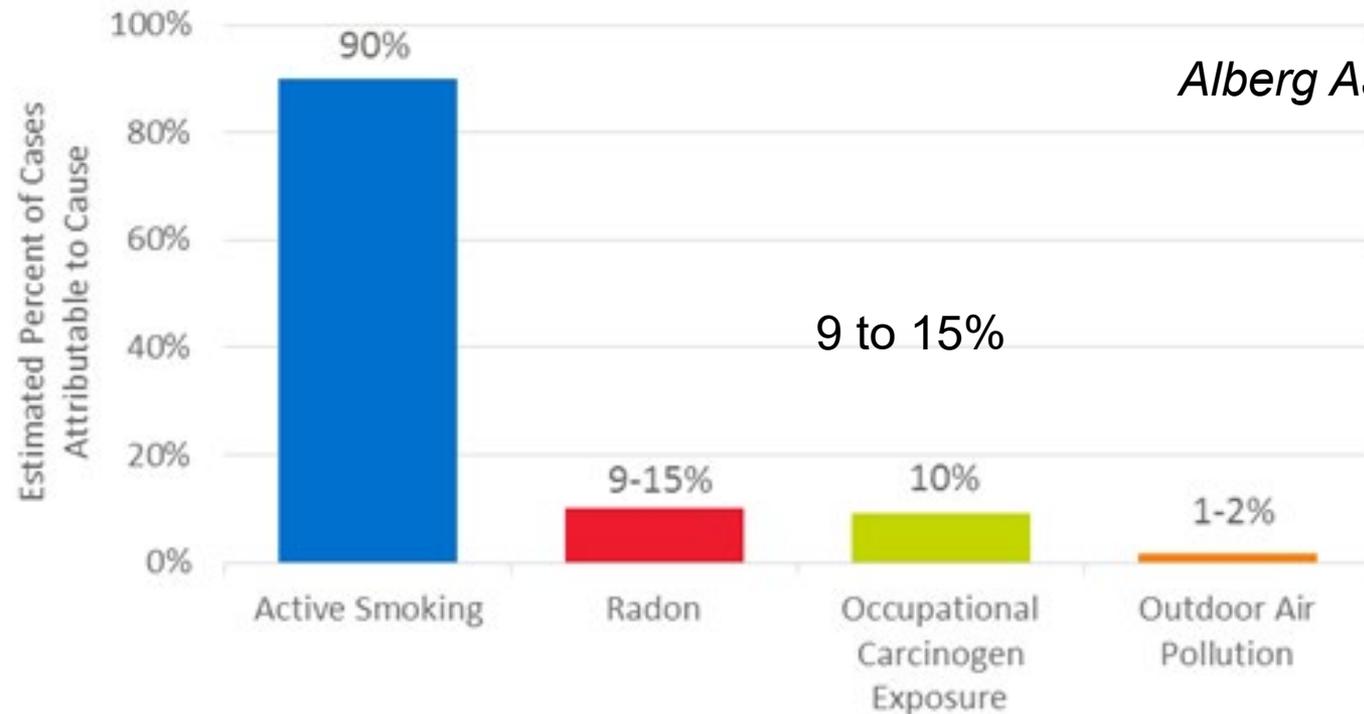
# Occupational Cancers – UK estimates

| CANCER         | Established   | Suggestive                         |
|----------------|---|------------------------------------|
| Lung           | Asbestos (~40%), Silica, Diesel, Painters, Passive Smoking, Welders, Radon (Miners), Arsenic, Chromium VI, ~10 others | Mineral oils, Cobalt               |
| Mesothelioma   | Asbestos (100%)   |                                    |
| Bladder        | Aromatic amines (~10%)  | Mineral oils, Diesel, Hairdressers |
| Oesophagus     |   | Tetrachloroethylene, Soot          |
| Haematological | Benzene, Radiation, Formaldehyde, some Insecticides   | Dioxins, Hairdressers              |
| Stomach        |   | Asbestos, Painters, Inorganic lead |

[International Agency for Research on Cancer](http://www.iarc.fr/)

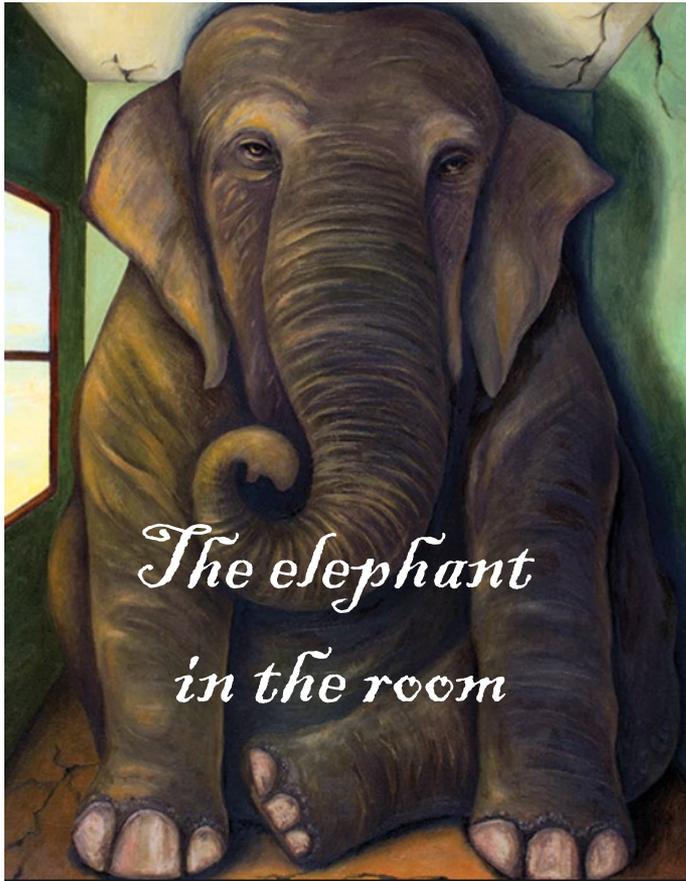
# How much of the lung cancer is due to occupational exposures?

Estimated Attributable Portion of Lung Cancer Cases by Cause <sup>11</sup>



*Alberg AJ et al, 2003*

# Environmental pollutants and cancer – the burden



Source: Vanderbilt Univ

International Agency for Research on Cancer

- In current estimations of the population attributable fractions of cancers environmental pollutants play no significant role; with the exception of indoor air pollution from cooking and heating with solid fuels in some low- and middle-income countries
- For several known or suspected carcinogens identified in occupational settings it is not clear whether the typical general population exposure levels pose any cancer risk
- It is challenging to detect modest associations with observational studies
- Environmental exposures (eg from pesticides, chemicals in water, soil, or air) may be bigger contributors than currently known

# Asbest Chrysotile Cohort

- 35,837 workers > 1 year active in 1975 or later
- Occupational histories back to 1950s
- 37% are women
- 70% enter cohort before the age of 25 years
- Median duration of employment 14.4 years
- 53% worked more than 10 years
- 30% worked more than 20 years
- 12,728 deaths



# General Conclusions

For up to 40% of cancers it is known how they can be prevented – this can be implemented in a national cancer control plan

Recommendations have to be tailored to the local population

Research has to continue to identify the remaining causes of cancer

Prevention takes long duration before the effect becomes measurable

The image shows the cover of a journal article titled "Toward the World Code Against Cancer" from the Journal of Global Oncology. The cover is framed in red and contains the following text:

**special article**

## Toward the World Code Against Cancer

**executive summary**

Overwhelmed by an abundance of often confusing, ambiguous, or apparently contradictory messages on disease prevention in today's multiple media streams, the general public would surely value authoritative, clear, and evidence-based instructions on how to actively contribute to the reduction of their cancer risk. The European Code Against Cancer is a set of 12 recommendations for individuals on how to reduce cancer risk. The Code carries the authority and reliability of expert scientists working under the coordination of the International Agency for Research on Cancer, the cancer research agency of the WHO. The Code's messages are aimed at individuals and have been enthusiastically promoted by European cancer associations. The experience of developing and promoting the European Code has generated interest in developing analogous recommendations for other regions of the world. Under the overall umbrella of a World Code Against Cancer using the same International Agency for Research on Cancer methodology, regional Codes could be developed, focused on regions sufficiently large and distinct to merit development of versions adapted to regional differences in risk factors and cancer patterns. Consideration of such an adapted model illustrates why a simple translation of the European Code would not be sufficient to promote cancer prevention globally.

**BACKGROUND**

It has been estimated that the cancer burden could be reduced by up to one half through primary and secondary prevention.<sup>1</sup> The European Code Against Cancer (ECAC) is a unique multi-risk prevention tool translating scientific knowledge on causes of cancer into actions individuals can take for cancer prevention. The ECAC was created in 1987 as a set of recommendations providing such advice on cancer prevention to European Union (EU) citizens. It informs the general public how to avoid or reduce exposures to scientifically established human carcinogens, adopt behaviors to reduce cancer risk, and participate in organized intervention programs under the appropriate national guidelines. It also informs stakeholders to guide national health policies in cancer prevention. The fourth edition was published in 2014 (Fig 1)<sup>2</sup> and is accompanied by a compilation of questions and answers for the general public that further explain the recommendations, give instructions on how to best follow them, and clarify additional information on other exposures and topics of interest in cancer prevention, such as messages for special target groups.<sup>3</sup>

This tool, focused on the European situation, nevertheless provides an excellent basis for scaling up to a World Code Against Cancer,

composed of adapted versions of the Code for different, defined regions of the world. Provision of science-based recommendations as a key cancer prevention tool should be tailored to the specific risk factors, cancer burden, and prevention priorities for the region. One of the features of the European Code was its development by leading cancer experts from the EU, helping ensure the focus was on the most relevant factors and encouraging ownership and application in the target population. For these reasons, simple translation of the European Code into other languages for use in other regions of the world would be insufficient. On the contrary, we consider it of utmost importance to adapt the Code to regional settings, cancer patterns, and health systems. Likewise, the most appropriate dissemination strategies should be designed to respond to regional circumstances, focusing on the most effective selected target groups (eg, the general public, health professionals, educators). Despite these important nuances, the experience from Europe provides the methodology and tools that are ready to use for the development of guidelines in other regions of the world, promising added value from the investment already made and the experience gained.

Successful preventive interventions require a combination of individual action (by avoiding or

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jgo.org JGO – Journal of Global Oncology

# Conclusions on Occupational Cancer

Occupational exposures are normally modifiable and therefore occupational cancers preventable

There are many open questions on the dose response and low level effects of many occupational carcinogens

Burden of occupational cancer and development of respective prevention strategies needs reliable exposure information from the local settings

**Russian Federation is in an excellent situation to research and subsequently prevent occupational cancers**

[International Agency for Research on Cancer](#)