



# The future of cancer prevention: setting realistic goals and timeframe

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*"We cannot treat our way out  
of the cancer problem"*

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

# Cancer control is a complex challenge

Because cancer is a highly heterogeneous disease:

- in occurrence
- in causes
- in biology
- in treatment

This calls for national cancer control plans which are integrated with NCD control but reflect national or regional priorities

# Cancer control is a dynamic challenge

- Overall number of cancers is projected to markedly increase, especially in low and middle-income countries
- The types of cancer which are common change in line with human development (*e.g. increases in colorectal and breast and decreases in cervix and stomach*)

# Primary cancer prevention

- Around **half of cancers could be prevented** by applying the knowledge we have;
- **The majority of cancers have a lifestyle or environmental cause**, so the potential for prevention is much higher

Vineis P and Wild CP (2014) The Lancet, 383: 549-557

European Code Against Cancer

12 WAYS TO REDUCE YOUR CANCER RISK

International Agency for Research on Cancer

# Primary cancer prevention – global priorities

Risk Factor	Comments
Tobacco	Implement WHO Framework Convention on Tobacco Control: taxation; bans on advertising; regulation on smoking in public places; counter the introduction into low and middle-income countries
Infections	<i>HBV</i> and <i>HPV</i> vaccination; <i>H. pylori</i> eradication (?); Avoid contaminated injections; treatment of <i>HBV</i> and <i>HCV</i> chronic carriers increasingly possible
Alcohol	Avoid harmful use of alcohol; increase awareness; taxation and regulation
Physical inactivity and weight control	Increase physical activity and improve weight control; major area where research is needed to provide evidence-base for preventive interventions

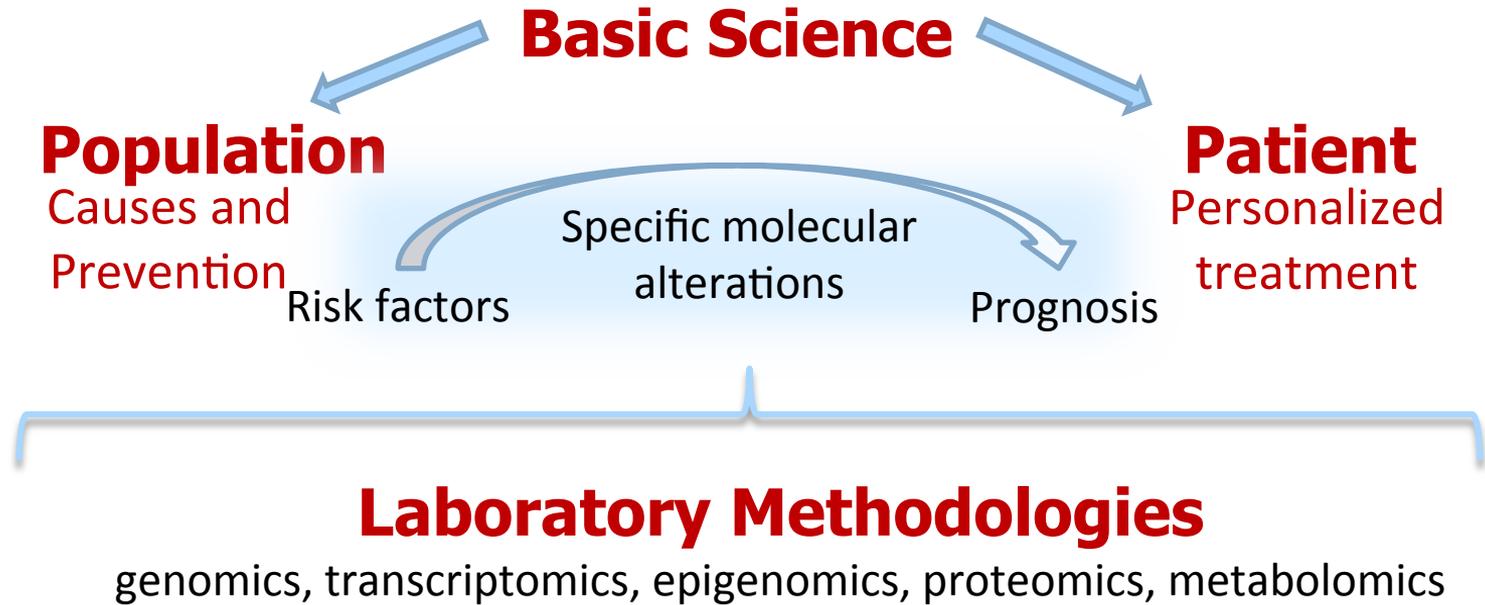
# Primary cancer prevention – global priorities

Risk Factor	Comments
Radiation	Avoid excessive sun exposure and indoor tanning; avoid excessive medical diagnosis, including in children; awareness and remediation of indoor radon levels
Environment	Address naturally occurring (arsenic, aflatoxins) or man-made (e.g. air pollution) carcinogens through regulatory and other control measures
Occupation	Occupational health; counter risks of “exporting” at-risk occupational exposures to low and middle-income countries
Reproductive factors and hormones	Limit use of HRT; Breastfeeding reduces mother’s cancer risk
Healthy diet	Eat plenty of whole grains, pulses, vegetables and fruits. Limit high-calorie foods; avoid sugary drinks, processed meat; limit red meat and foods high in salt.

# Cancers where aetiology is (largely) unknown

Organ sites	Estimated annual no. new cases worldwide	Percent global cancer burden
Prostate	1,100,000	7.9
Lymphoma and Leukaemia	850,000	6.0
Kidney	340,000	2.4
Pancreas	340,000	2.4
Thyroid	300,000	2.1
Brain	260,000	1.8
Colorectal	1,400,000	9.7

# Two-way Translational Cancer Research

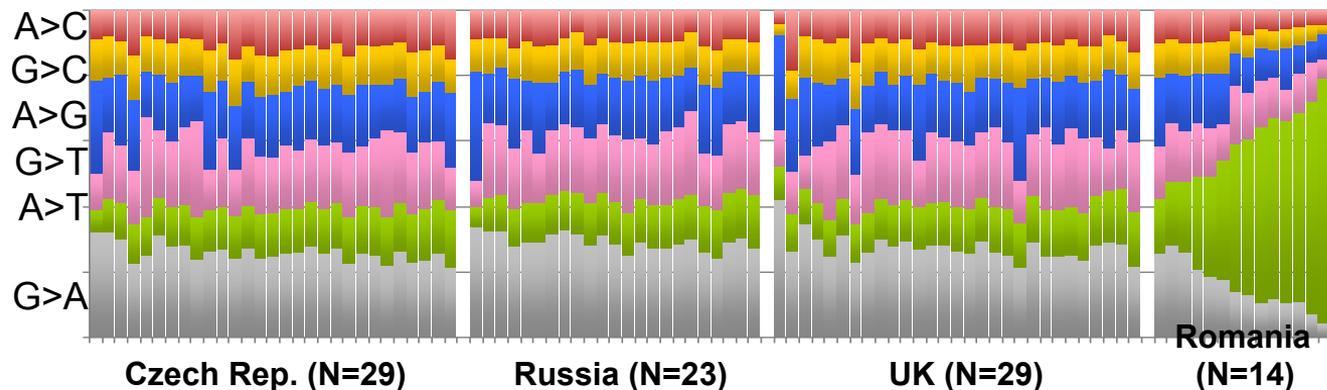


# Cancer causation – clues from genomics

(Scelo et al., Nature Comm. 5: 5135, 2014)

Mutation patterns from WGS of **95 conventional renal cell cancers**:

High A>T mutation rates in Romanian cases – Mutation distributions:



EC FP7 programme  
International Agency for Research on Cancer



Typical signature of **Aristolochic acid** induced mutations:

Known in TP53 for rare urothelial cancers

Established genome wide in mouse fibroblasts

**First study to implicate an unanticipated environmental factor through analysis of genomic data**

Major potential for **disease prevention**

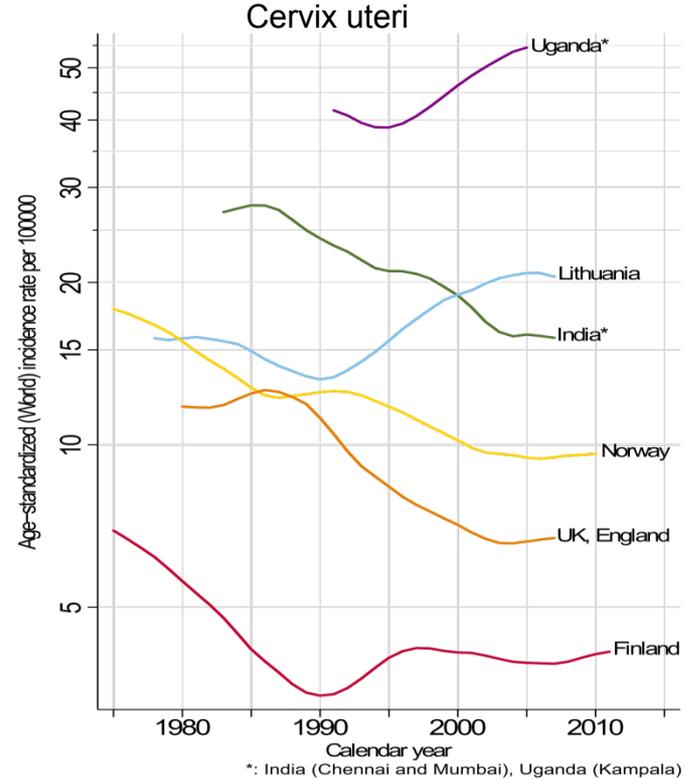
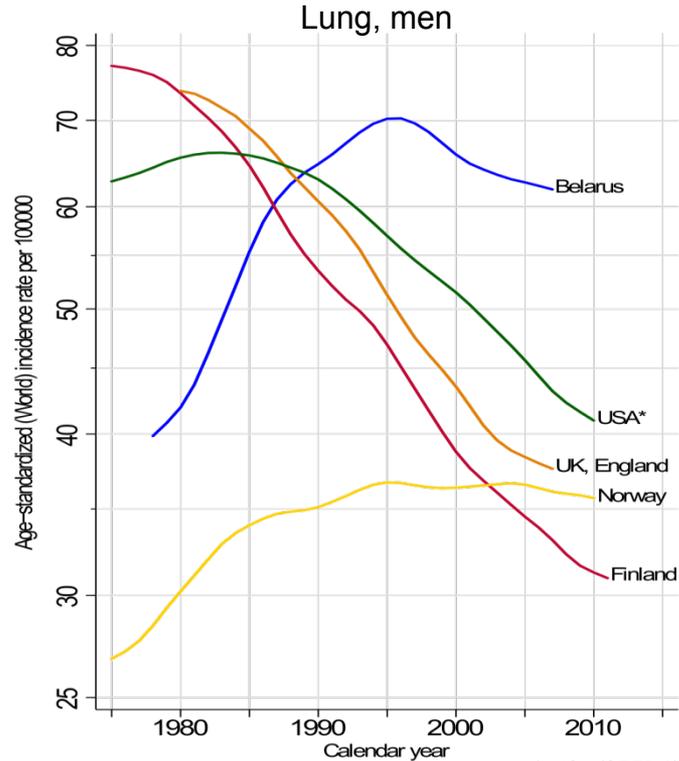
# Secondary prevention – global priorities

- **Breast cancer\***: mammography; clinical breast examination; breast awareness
- **Cervical cancer**: cytology; HPV DNA testing; visual inspection with acetic acid
- **Colorectal cancer**: FOBT, sigmoidoscopy, colonoscopy
- **Oral cancer**: visual inspection; in high incidence regions (e.g. east Asia) among high risk groups

The prime importance of quality-assured, national programmes

# Prevention works but takes time

- lung and cervix



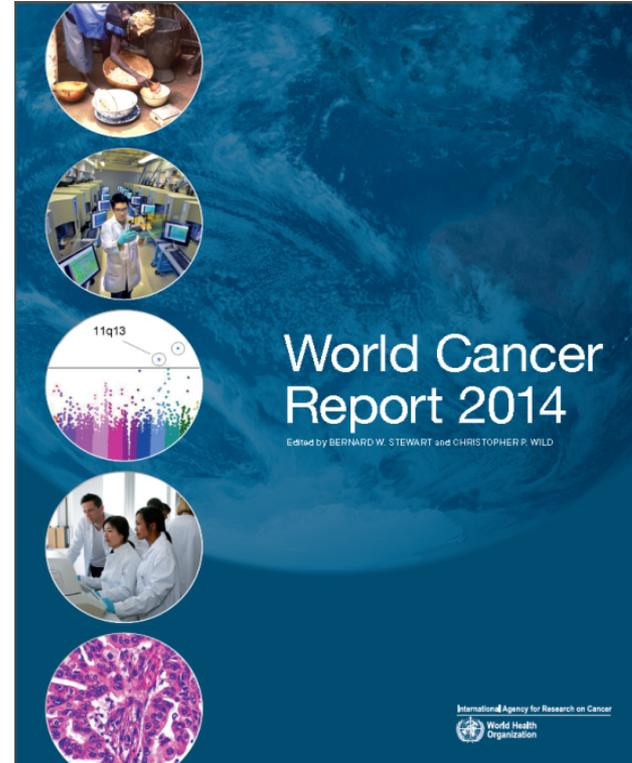
# The need for implementation research

- Moving from the demonstration of *efficacy in trials* to *effectiveness in programmes*
- Integrating research and health services development – *building-in capacity*

# Research funding – the need for a different model

- Research on prevention is under-funded (*2-3% in Australia, Canada and UK*), yet vital to cancer control
- **Relatively little private sector interest in prevention research**
- Governments need independent, policy-relevant research (e.g. on diet)
- **Public research funding needs to be directed to prevention, otherwise knowledge gaps will remain**
- An international research coordination is required

# We have a duty of care to the patients of today and to the populations of tomorrow



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