Global cancer trends: implications for cancer research and prevention

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Global cancer burden – mortality, incidence, and prevalence

GLOBALLY 1 IN 5 MEN AND 1 IN 6 WOMEN WILL DEVELOP CANCER BEFORE THE AGE OF 75 YEARS
Common cancers globally - INCIDENCE

14.1 million new cases worldwide (both sexes)
(6.1 in more developed regions, 8.0 in less developed regions)
Common cancers globally - MORTALITY

Mortality: 8.2 million deaths worldwide (both sexes) (2.9 in more developed regions, 5.3 in less developed regions)
Cancer: a global but not uniform problem

Leading cause of cancer death 2012

International Agency for Research on Cancer
World Health Organization
Cancer: a global but not uniform problem

Leading cause of cancer death 2012

Breast cancer: 25% of all female cancers; 20% of all cancer survivors
Inequalities in cancer burden: breast cancer incidence and mortality rates by region
Cancer burden in the next two decades – the demographic effect

2012

14.1 Million

- New cases 2012 = 0.5 million

2035

23.3 Million

- New cases 2035 (+ demographic changes)

International Agency for Research on Cancer

http://globocan.iarc.fr/
Demographic changes drive up the cancer burden

Source: UNPD

International Agency for Research on Cancer

World Health Organization
Changing exposure patterns (e.g. westernized lifestyle) - altered cancer incidence rates

Urbanisation

2016

<table>
<thead>
<tr>
<th>Low HDI  (50%)</th>
<th>Medium HDI (30%)</th>
<th>High HDI  (20%)</th>
<th>Very High HDI (5%)</th>
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</thead>
<tbody>
<tr>
<td>Rural population</td>
<td>Urban population</td>
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Source: UNPD
Cancer burden in the next two decades – demographics + change in incidence

2012

14.1 Million

2035

29.4 Million
Cancer transitions with human development: breast and cervix

Medium and high HDI: decreases in cervical and stomach cancer offset by increases in breast, prostate and colorectum
Total productivity loss due to premature mortality from cancer

BRAZIL, RUSSIA, INDIA, CHINA AND SOUTH AFRICA

$46.3$ billion (0.33% GDP)

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World Health Organization

Pearce et al, in preparation.
“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
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;
- Many common cancers still of largely unknown aetiology, either globally (e.g. prostate) or regionally (e.g. oesophagus)

## Major cancer risk factors

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Comments</th>
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<tbody>
<tr>
<td>Tobacco</td>
<td>Implement WHO FCTC; taxation; bans on advertising; regulations on smoking in public places; counter the introduction into low and middle-income countries (LMIC)</td>
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<td>Alcohol</td>
<td>Avoid harmful use; increase awareness; taxation and regulation</td>
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<td>Physical inactivity, overweight and obesity</td>
<td>Increase physical activity and improve weight control; urban planning;</td>
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<td>Unhealthy diet</td>
<td>Limit red meat intake, avoid processed meat; fruit and vegetables; consider legislation, taxation on high-calorie foods and drinks</td>
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<tr>
<td>Infections</td>
<td>HBV, HPV, H. pylori, HCV; HBV and HPV vaccination; avoid contaminated injections</td>
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<tr>
<td>Radiation</td>
<td>UV light; ionising radiation; medical diagnostic, indoor radon, regulation on tanning salons</td>
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<td>Environment</td>
<td>Regulatory measures; naturally occurring (arsenic, aflatoxins); industrial (air pollution, asbestos)</td>
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<td>Occupation</td>
<td>Regulatory measures; avoid “exporting” at-risk exposures to LMIC</td>
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<tr>
<td>Reproductive factors, hormones</td>
<td>Earlier age at menarche, later age at first live birth; fewer children; shorter duration of breast feeding; combination hormone replacement therapy</td>
</tr>
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Adapted from Franceschi and Wild, Molec. Oncol., 7: 1-13, 2013
See also IARC Monographs Volume 100
Adapt prevention to the national or regional situation

Global burden of cancer attributable to infections in 2012
(overall 2.2 million - 15.4% of all cancers)

Plummer et al. 2016 - Lancet 2016 e609-e616

Global burden of cancer attributable to high BMI in 2012
(overall 481 000 - 3.6% of all cancers*)

*of new cancer cases in men and women aged 30 years and older

International Agency for Research on Cancer

Arnold M et al., Lancet Oncol, 2014
Secondary prevention – early detection, diagnosis and treatment

- **Breast cancer**: mammography; clinical breast examination; breast awareness
- **Cervical cancer**: cytology; HPV DNA testing; visual inspection with acetic acid, Lugol’s iodine
- **Colorectal cancer**: Faecal occult blood test, sigmoidoscopy, colonoscopy
- **Oral cancer**: visual inspection; in high incidence regions (e.g. India) among high risk groups
Prevention works but takes time – the need for vision and leadership.
Conclusions

• The health, social and economic challenges of a rising cancer burden must be met by an integrated approach of prevention, early detection and treatment

• There are many opportunities to act now if evidence is translated into practice

• There should be increased support for research on prevention and early detection